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# Interpersonal behavior and risk of workplace violence and threats

- sector specific trends, prevention behavior,  
and the escalation of workplace aggression

PhD dissertation 2015



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Sincere thanks to my supervisors for their constructive feedback and support throughout the years.

## **PREFACE**

Aspiring to be a psychologist and help people, at the age of 18, I spend 6 months working at a nursing home outside London. In my very first week I was bitten – leaving clear teeth marks – punched, and showed. The other young girls working there had warned me that I was in that ward with clients who were lost to dementia. And that violence was part of the game. In the years to come I worked at different nursing homes and also at homes with young adults with autism, and although violence was always a possibility I experienced very different ways of behaving with regard to prevention and also how seemingly unrelated events influenced aggression among these clients. Examples of this were complete lack of prevention policies or training in comparison to elaborate programs with supervisors taking the time to discuss the what, why, and how with regard to defining and preventing violence. Further, I observed that in periods with unstable organizational climate and many conflicts among staff, there seemed to be more incidents with aggressive clients. Although, these observations were without any scientific value, they have guided my way to the current thesis, in hopes of shedding light on some of the possible associations between psychosocial dimensions and the frequency of workplace violence.

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# INTRODUCTION

Workplace violence and threats of violence are considered one of the principal occupational health hazards for many people at work (Leather & Zarola, 2010). Reviews have shown that exposure to workplace violence and threats is particularly high in service and human service sectors, such as healthcare, education, public safety, retail, and justice industries (Hogh & Viitasara, 2005; Piquero, Piquero, Craig, & Clipper, 2013; Spector, Zhou, & Che, 2014). The literature shows exposure rates as high as 66.9% for nonphysical violence and 36.4% for physical violence for nurses (Spector et al., 2014), and among special educators 42.3% for nonphysical violence and 21.7% for physical violence (Tiesman, Konda, Hendricks, Mercer, & Amandus, 2013). Further, among U.S. correctional officers, from 1999-2008, there were 125,200 non-fatal injuries and 113 fatal injuries of which 38-40% were due to assaults and violent acts (Konda, Tiesman, Reichard, & Hartley, 2013). Although, these estimates all warrant action, trying to compare estimates of work-related violence in areas of human service work is complicated, because studies use different definitions and measures for workplace violence, use different methods and collect data at different time points. Thus, one aim of this thesis is to map and compare estimates from different human service sectors using the same definition and measures for workplace violence and threats, the same method, and the same period for data-collection.

Risk of exposure to workplace violence has been associated with individual factors such as gender, prior exposure to workplace violence, low age and low seniority (Arnetz, Arnetz, & Petterson, 1996; Hogh, Borg, & Mikkelsen, 2003; Lawoko, Soares, & Nolan, 2004; Sharipova, Hogh, & Borg, 2010). Studies have also pointed to risk factors at a workplace level including low co-worker support and more role conflicts, high demands at work, low leadership quality, and low decision latitude (control) (Cole, Grubb, Sauter, Swanson, & Lawless, 1997; Sharipova et al., 2010; Soares, Lawoko, & Nolan, 2000). Working during evenings, at nights, doing shift work, working alone, and working with close contact with clients have been identified as structural risk factors (Konda, Reichard, & Tiesman, 2012; Sharipova et al., 2010). Further, risk factors related to characteris-

tics of the perpetrator have been studied extensively, these include patient illness (e.g. dementia, psychoses, bipolar, personality disorders), substance abuse, comorbidities, with the best predictor being prior history of violence (Brooks, Staniford, Dollard, & Wiseman, 2010). However, researchers conclude that perceptions of violence are less associated with patient characteristics than with qualities of the working environment (Roche, Diers, Duffield, & Catling-Paull, 2010), and that the psychosocial context of organizations should be considered in the prevention of workplace violence and aggression (Chang, Eatough, Spector, & Kessler, 2012). Thus, a second aim of this thesis is to explore aspects of interpersonal behavior that may either be associated with increased risk or decreased risk of exposure to workplace violence and threats. These aspects of interpersonal behavior include prevention behaviors among co-workers, supervisor and top-management, and also aggressive behaviors, such as bullying and conflicts.

## **The present study**

This thesis presents results from a study that is part of a larger research project concerning workplace violence and threats. The overarching project included a qualitative study using interviews, a study of register-based sick-leave, and the current quantitative study using questionnaires at baseline and follow-up. The overall aim of this large research project was to examine work-related risk factors and protective factors with regard to exposure to workplace violence and threats in high-risk work sectors. A secondary aim was to establish a database from which future studies concerning both intervention and more longitudinal effects may be investigated. This overarching research project was funded by the Danish Work Environment Research Fund, project no. 20-2009-03.

## **BACKGROUND**

### **Definition of workplace violence**

No single uniform definition of workplace violence exist, but a well-known research definition states that workplace violence refers to “Incidents where staff are abused, threatened or assaulted in circumstances related work, including commuting to and from work, involving explicit or implicit challenges to their safety, well-being or health”(Wynne, Clarkin, Cox, & Griffiths, 1997). Schat & Kelloway (2005) suggested that workplace violence should specifically refer to physical aggression (physical assaults or the threat of assault), while aggression is the more general term also encompassing a variety of interpersonal behaviors that may cause psychological harm (Barling, Dupré, & Kelloway, 2009; Schat & Kelloway, 2005). Accordingly, all violent behaviors are, by definition, aggressive whereas not all aggressive behaviors are violent. The current thesis applies both these definitions of workplace violence in that it must take place in relation to work, and refers to behaviors that explicitly or implicitly imply physical harm, i.e. threats of violence and physical violence. Thus, throughout this thesis the term ‘workplace violence’ covers both threats of violence and physical violence.

## **Theories of aggression**

The etiology of aggression may be viewed according to different theoretical perspectives, such as innate urges or personal dispositions, cognitive or emotional processes, externally elicited drives, or social conditions (Baron, 1977). For the present thesis, aggression is situated within a working environment and therefore theory regarding the impact of external conditions, i.e. situational and social conditions will be examined.

### **Frustration-aggression hypothesis**

The frustration-aggression hypothesis proposed by Dollard, Doob, Miller, Mowrer, and Sears (1939) has exerted a tremendous impact on both theory and research concerning aggression (Baron, 1977). Frustration was seen as the result of external aversive conditions, defined as the blocking or thwarting of some ongoing, goal-directed behavior. This frustration induces an instigation toward aggression (aggressive drive), which then facilitates and encourages such behavior. Dollard et al. (1939) asserted that frustration and aggression was inherently linked, which subsequently has been widely criticized considering the variety of reactions to mistreatment (Baron, 1977). One of the authors of the original publication later offered a theoretical model of displaced aggression (Miller, 1984), which posits that if aggressing against a frustrator is inhibited by strong fear of punishment than this aggression will be displaced to other targets resembling the frustrator but with much less capacity to punish. However, what constitutes adequate similarity for displacement is undetermined (Baron, 1977).

Berkowitz has offered some influential revisions and clarifications of the original frustration-aggression theory (Berkowitz, 1965; Berkowitz, 1969; Berkowitz, 1983; Berkowitz, 1989). He clarified that the frustration-aggression hypothesis specifically focuses on hostile (or emotional) aggression, in which the primary goal is to do harm, in contrast to instrumental aggression, where aggressive actions are a means to obtaining other rewards (1989). Furthermore, Berkowitz emphasized the emotional and cognitive processes that link specific environmental conditions (i.e., frustrating or aversive events) with aggression (1989). According to his cognitive neoassociation model “thwartings produce an instigation to aggression only to the degree that they generate negative affect” (1989, p.60). The appraisal of sensory, situational, memory and ideational cues influence the subsequent appraisal of fight or flight tendencies, and if mitigating informa-

tion has been provided this will influence the degree of anger and aggressive tendency (1989). Thus, Berkowitz introduced several moderating factors in addition to proposing negative affect as a mediator of the relationship between frustration and aggression. Fox & Spector (1999) formulated and tested a model of work frustration-aggression, which portrays the sequence of frustrated events (situational constraints), emotional reactions to frustration (e.g. job dissatisfaction), and behavioral reactions (interpersonal and organizational aggression), in organizational work. Their study confirmed the hypothesized relationships, i.e. a positive relationship between employees' experience of situational constraints and aggressive behaviors, mediated by emotional reactions to frustration. Although, their study is limited due to its cross-sectional design, a sample size of 178, and a response rate of 48%, it does give substantial insight to the potential of the revised frustration-aggression hypothesis within an organizational setting.

### **Social-interactionist framework**

In contrast to the frustration-aggression hypothesis, the social interactionist approach interprets aggressive behavior as goal-oriented rather than as an involuntary release of aggressive energy toward the frustrating agent or "displaced" against an unassociated target (Felson, 1992; Felson & Tedeschi, 1993). The social interactionist framework interprets aggressive actions as instrumental behavior, more specifically defined as coercive behavior in which an actor intends to harm another person (unwilling participant), but harming others is a means to various ends, not an end in of itself. The emphasis on social interaction relates to the dynamic interchange between participants in an aggressive encounter. Thus, if someone perceives a rule violation without an adequate explanation for the alleged offense, then this is likely to be punished. Punishing the perceived norm violation constitutes the first attack, which may be retaliated in order to deter future attacks, achieve justice and/or save face. The outcome of an aggressive interchange depends on both the behavior of the instigator and the target, while third parties and the setting also may influence the exchange (Felson, 1992; Felson & Tedeschi, 1993).

The effects of stress on aggression are not easily explained by the social interactionist perspective. However, according to Felson (1992), stressful events indirectly affect aggression through their effect on the targets behavior. Feelings of frustration and being distressed may make it difficult to feign positive emotions and cause less competent work performance and violation of social norms, which others may consider provoca-

tive and thus react aggressively toward the distressed person (Felson, 1992). This interplay is particularly relevant for employees in the human service sectors, where clients may have severe impulse problems due to a variety of diagnoses and/or history of violence. These clients may perceive minor negligence on part of the staff member as norm violations and thus react with escalated aggressive behavior, which the employee may sanction (punish) in order to regain control and deter unwanted behaviour; this may subsequently instigate further counter-attacks. However, the primary punishment may also be the intentional action by the teacher, correctional officer or nurse in order to deter unwanted behavior and to encourage future compliance (Felson, 1999). Felson argues that this type of punishment is aggression given a positive face. He argues that we should avoid defining aggression as a harmful act that we believe is antisocial or wrong; it is more precise to say that we approve of some acts of aggression and disapprove of others. Whether the primary punishment is an intentional action by the staff member or the client, the central point is the perception of and reaction to this punishment, and whether retaliatory reactions are initiated, thus resulting in an escalatory cycle (Felson & Steadman, 1983).

### **An escalatory pattern of aggression**

Felson (1983) studied incidents leading to criminal violence and found a systematic pattern of increasingly aggressive behaviors, from identity attacks, attempts and failures to influence the antagonist, threats and finally physical attack. Prospective data from marital relationships (Murphy & O'Leary, 1989) also suggest a progression from psychological aggression to physical aggression. These findings have inspired a few studies regarding patterning of workplace aggression. Glomb (2002) found that prior to one aggressive incident individuals were more likely to have engaged in less severe behaviors than more severe behaviors; also, Dupre & Barling (2006) found that psychological aggression toward supervisors was positively associated with physical acts of aggression directed toward supervisors. In addition, they found that psychological aggression partially mediated the relationship between interpersonal injustice and physical aggression, also supporting the notion of a progression of violence from less serious to more extreme acts (Dupré & Barling, 2006). Lastly, Lanza and colleagues (2006) found that health care workers who had experienced non-physical violence were 7.17 times more likely to experience physical violence. These studies, however, are limited due to their cross-sectional design, which does not allow for conclusions regarding directionality.



The aforementioned studies, moreover, cannot account for escalation due to accumulation of aggressive incidents over a period of time (Andersson & Pearson, 1999). This accumulation may be understood in terms of a “triggering mechanism” or “tipping point”, in that one incident after a series of aggravating encounters may cause an employee or client to lose motivation to maintain control over his or her actions. Thus, the tipping point prompts a more intense behavioral response, such as evolving from non-physical aggression to threats of assaults and further to physical assault (Andersson & Pearson, 1999; Schat & Kelloway, 2005).

Dollard and colleagues (1939) also commented on possible accumulation effects, such that each thwarting might leave some residual instigation to aggression, which presumably become added together, so that prior frustrations can intensify the aggressive reaction evoked in the immediate situation. Berkowitz (1989) added that this accumulated effect should be understood as a lowering of a response threshold, such that the person is sensitized by prior frustrations and thus more readily react with aggression. In light of possible accumulation effects, there is a need for a longitudinal study testing the possible progression of workplace aggressive behaviors and whether less intense aggression mediates more extreme aggressive (violent) behaviors (Barling et al., 2009).

### **Are escalating patterns of aggressive behavior target-specific?**

Studies on patterns of escalating aggressive behavior have almost exclusively focused on behaviors within the same victim-perpetrator relationship, implying that escalating patterns may be target-specific (Dupré & Barling, 2006; Felson & Steadman, 1983; Glomb, 2002; Murphy & O'Leary, 1989). However, Lanza and colleagues (2006) showed that when the perpetrator of the most recent non-physical violence was a staff member, the perpetrator of the most recent physical violence was almost as likely to be a patient as a staff member. Although this result is cross-sectional and correlational it does suggest an association between acts committed by employees and acts committed by clients, which may reflect a release of aggression among unassociated targets, i.e. displaced aggression (Berkowitz, 1989; Dollard, Doob, Miller, Mowrer, & Sears, 1939; Miller, 1984).

The issue of non-specific and target-specific escalation may also pertain to the hypothesized mediating role of negative affect or strain (Berkowitz, 1989; Felson, 1992; Fox & Spector, 1999). In a work-setting, frustrations may result in emotional exhaustion,

which is a dimension of burnout that resembles job stress, reflecting a depletion of emotional and physical resources (Maslach, Schaufeli, & Leiter, 2001). A positive relationship between emotional exhaustion and interpersonal aggression was found by Winstanley and Whittington (2002). They postulated a cyclical relationship between aggressive encounters and burnout, and suggested that other sources of burnout such as workload and working conditions may equally contribute to more vulnerability to aggression through the effect of burnout on behavior (Winstanley & Whittington, 2002). This implies a non-specific increased vulnerability to aggression.

Winstanley and Whittington (2002) also found that the most significant differences in burnout were related to being exposed to workplace aggression multiple times. As such, they argued that aggressive encounters can have a cumulative effect upon levels of burnout, which will make employees more vulnerable to aggression. The cyclical model could not be tested within Winstanley and Whittington's cross sectional study, and thus there is need for a longitudinal study on accumulated aggression, burnout and possible target-specificity.

### **Theories of aggression: Summary and implications**

According to the theories of aggression that I have presented above, aggression may be an involuntary response to aversive events directed at the source of frustration or "displaced" against unassociated targets; or, aggression may be a purposeful response in order to infuse social control in cases of perceived rule violation. Further studies are needed to investigate the hypothesized pattern of escalating aggressive behaviors in a work setting, and whether escalating behaviors only occur in target-specific encounters or whether escalation may occur among unassociated targets as a function of emotional exhaustion. The emphasis on external aversive events as antecedents of aggression presents a relatively optimistic view on prevention, in that a reduction of frustrating conditions will decrease incidents of aggression; furthermore, the introduction of cognitions and emotions by Berkowitz implies that training how to think and act in situations may counter-act an urge to retaliate and thus escalate a potentially high-risk situation.

## **Violence-prevention behavior**

In the following, I will present the construct of violence prevention-climate, which offers a comprehensive frame for violence-prevention. Further, I will comment on the complexity of prevention and identifying risk factors associated with workplace violence.

### **Violence prevention-climate**

For over 30 years a strong theoretical and empirical base has been developed under the rubric of safety climate, which refers to shared perceptions among members of the organization regarding safety policies, procedures, and practices (Zohar & Luria, 2005). Evidence shows that safety climate is important for predicting individual safety behaviour, industrial accidents, and treatment errors in healthcare (Silva, Lima, & Baptista, 2004; Cooper & Phillips, 2004; Johnson, 2007; Naveh, Katz-Navon, & Stern, 2005).

Spector and colleagues (2007) were the first to extend the idea of safety climate to the context of workplace violence, and they coined the term 'perceived violence-prevention climate'. They defined a positive perceived violence-prevention climate as when management emphasizes the control and elimination of violence and verbal aggression (pp.119-120). This covered such aspects as assault/violence prevention training, policies regarding these behaviors, policies for reporting incidents, and whether or not management takes violence and verbal aggression seriously. Their study of 198 female nurses showed that violence climate was significantly and negatively related to violence, verbal aggression, injury, and perceived danger.

Kessler and colleagues (2008) refined the violence climate construct by developing it as a multidimensional construct: policies and procedures, practices and responses, and pressure for unsafe practice. The policies dimension refers to an employee's awareness of the formal regulations, where the practices and responses dimension refers to how management adheres to these formal regulations and their response to violent incidents. While the former two dimensions were included in the original perceived violence-prevention climate construct, Kessler and colleagues added the latter dimension, which refers to employee's perception of pressure to ignore the violence prevention policies and procedures in order to meet other demands. Their study of 216 full-time

employees from a variety of jobs and industries showed that the dimension of practices and responses may be the most important predictor of physical violence, whereas policies and procedures may be more relevant for exposure to verbal aggression. They concluded that the response of supervisors to violent behaviors might well be more effective in curtailing violence than prevention policies alone.

Chang and colleagues (2012) conceptualized poor violence-prevention climate as stressors associated with increased strain and reduced prevention motivation. They explored the relationship between violence-prevention climate, prior exposure to aggression or violence, and engaging in prevention behaviors, while testing possible mediation effects of motivation and strain. Based on their study of 172 employee and co-worker dyads, they concluded that the practices and responses dimension may be the most important element, considering that it was linked to prevention behavior through both strains and motivation. Again, this finding was related to the importance of management reactions to assaults. Although this study has important contributions, it does not link engaging in prevention behavior to reduced risk of exposure to violence or aggression. Furthermore, all of the above studies on violence-prevention climate use cross-sectional designs and most lack adequate information about response rates; moreover, the heterogeneity of the participants is questionable.

Yang and colleagues (2012) conducted the only longitudinal study of violence-prevention climate and they found that only the dimension of pressure for unsafe practice was significantly and positively associated with exposure to physical violence over six months (odds ratio 1.69). This result contradicts findings from former studies, where the dimension of practices and responses is suggested as the more important element of violence-prevention climate. However, there are important limitations to this longitudinal study. Although they invited 1565 nurses to participate, only 176 nurses completed both surveys, which corresponds to a follow-up response rate of only 11%. Thus, there is still a need for a longitudinal study examining the effects of violence-prevention climate on exposure to workplace violence, particularly investigating the potential effects of prevention behaviors inherent to the dimension of practices and responses.

### **Prevention behavior as the enactment of formal violence prevention policies**

Interventions aimed at preventing workplace violence can be categorized as environmental (e.g. bullet-proof glass), organizational and administrative (e.g. developing training programs and safe work practices) and behavioral/interpersonal (e.g. training staff to anticipate, recognize, and respond to conflict and actual violence) (Merchant & Lundell, 2001). However, these categories may be mixed, such that a behavioral dimension includes the practice of organizational and administrative policies. This corresponds to the practices and responses dimension in the violence-climate construct (Chang et al., 2012; Kessler, Spector, Chang, & Parr, 2008; Yang, Spector, Chang, Gallant-Roman, & Powell, 2012), which was defined as management's adherence to policies on violence prevention and response to workplace violence incidents. In theory, these violence prevention behaviors by management are linked to fewer incidents of workplace violence by indicating how employees should prioritize and what consequences to expect from their (in)actions (Zohar & Luria, 2004). For example, if supervisors consistently ignored reports of threats and/or violence than employees would regard violence prevention as a low priority. Conversely, if supervisors were adamant about reporting then ignoring to report incidents would be perceived as warranting sanctions. Behavior expectancies are particularly important in situations with conflicting demands, such as spending time with a client or filling out administrative reports. Thus, the true effect of violence prevention policies depends on its enacted counterpart.

Evidence from research on safety climate has shown that both top level management and supervisor level management may have significant effects on employee behavior (Zohar & Luria, 2003; Zohar & Luria, 2005). However, the practices and responses dimension does not distinguish between levels of management. Furthermore, while both Kessler and colleagues and Chang and colleagues emphasize the response to incidents in order to effectively curtail violence, the dimension of practices and responses does not include social support. In theory, social support may reduce future risk by alleviating victim's symptom of strain (Schat & Kelloway, 2003; Leather, Lawrence, Beale, & Dickson, 1998), given that various strains may reduce capabilities to comply with prevention policies (Chang et al., 2012) and may increase aggressive outburst due to a lack of mental resources (Aquino & Thau, 2009; Felson, 1992). Moreover, some studies have incorporated support from co-workers in their safety climate measure and found negative associations with prevalence of verbal abuse (Gimeno, Barrientos-Gutierrez, Burau, & Felknor, 2012; Gimeno, Felknor, Burau, Delclos, & Barrientos-Gutierrez, 2007).

These latter results imply a potential preventive role of co-workers (Gimeno et al., 2007; Gimeno et al., 2012; Schat & Kelloway, 2003). The influence of co-workers may be of considerable strength if informal groups or informal leadership has developed; these informal work groups serve as guides to correct behavior and may exercise pressure to conform to these group standards and norms (Schein, 2010; Hussein, 1989); thus, influencing the potential preventive effects of enacted policies.

In sum, while the practices and responses dimension has much to offer with regard to analyzing enacted policies and the potential preventive effects, there are empirical and theoretical reasons for refining categories; this concerns specifying prevention behaviors at different levels within an organizational hierarchy, e.g. co-workers, supervisors and top management, and including the aspect of social support.

### **The complexity of prevention and identifying risk factors**

A review of the literature on intervention effectiveness shows that most violence prevention interventions concern training how to cope with combative clients and avoid injury, and to a lesser extent organizational policies or environmental design (Wassel, 2009). Further, this review showed that there is much variability among studies in the types and effectiveness of training. In fact, training has both been related to 50% decreases in violent interaction at 3-month follow-up, although this returned to baseline levels at 6-months (Fernandes et al., 2002), while another finding showed two-fold increases in the frequency of assaults when comparing data 12-month prior to the training and 11 months after training (Wilkinson, 1999). A study on organizational policies showed significant reduced risk (OR= 0.5) related to 'zero tolerance' for violence and a list of prohibited violent behaviors (Nachreiner et al., 2005); however, the policy of 'zero tolerance' has also been related to an increase of reporting incidents by 85% during the following year ([www.arbejdsmiljoviden.dk](http://www.arbejdsmiljoviden.dk), 2013). Incident reporting is viewed as an integral part of violence prevention programs, both as a means of following up on incidents (tertiary intervention) and thereby informing opportunities to reduce incidents (primary intervention) (Brooks et al., 2010). Paradoxically, interventions may cause a spontaneous increase in reporting in the follow-up period due to a general under-reporting of incidents (Arnetz & Arnetz, 2000; Gifford & Anderson, 2010; Snyder, Chen, & Vacha-Haase, 2007), which complicates measuring the effectiveness of interventions.

The complexity of prevention effect is parallel to the complexity of possible and nu-

merous risk factors associated with workplace violence. As mentioned in the introduction to this thesis, multiple risk factors have been identified at different levels, such as individual, workplace level, and structural level. However, studies reveal that these risk factors do not consistently increase risk (Andersen, Hogh, Biering, & Gadegaard, 2015; Hogh & Viitasara, 2005; Viitasara, Sverke, & Menckel, 2003). In particular, factors that proved to be a risk factor in one setting did not necessarily manifest itself as a general risk factor for all occupational groups (Viitasara et al., 2003) or across human service sectors (Andersen et al., 2015). Thus, when studying and/or managing workplace violence there should be a comprehensive framework that illustrates that no single factor can explain incidents of workplace violence (Viitasara et al., 2003; Viitasara & Menckel, 2002; Hogh & Viitasara, 2005; Brooks et al., 2010).

### **Violence-prevention behavior: Summary and implications**

Violence-prevention climate is defined as shared perceptions among members of the organization regarding violence prevention policies and procedures, practices and responses, and pressure for unsafe practice. Empirical evidence suggests that the dimension of practices and responses may be the more important element in preventing workplace violence. However, theoretical and empirical literature suggests refining categories of this dimension. Thus, the current thesis specifies this dimension as prevention behaviors at different levels within an organizational hierarchy, e.g. co-workers, supervisors and top management, while including the aspect of social support. By emphasizing the dimension of practices and responses as opposed to the entire climate construct, this thesis focuses on individual employee's perception of prevention behaviors, as opposed to shared perceptions of multiple sources constituting an aggregate climate. Although these prevention behaviors may indicate a broader climate, it is not the subject under study. In recognizing the complexity of prevention and multiple risk factors associated with workplace violence, the following section presents a framework of reference for the three studies conducted for this thesis.

## Frame of the thesis

Figure 1 presents a framework of reference for the three papers conducted for this thesis. This framework is adapted from the work by Viitasara and Menckel (2002), who developed a model for identifying individual and organizational risk factors for the prevention of workplace violence. This framework promotes the idea that violence is the culmination of a process, not an isolated event. Workplace violence occurs in a specific situation, but broader situational and structural factors shape a context/setting for what takes place. As such, this framework integrates different levels of factors associated with workplace violence.

Viitasara and Menckel (2002) defined a structural level of risk factors in terms of organizational features, such as the type of local-government unit to which the organization belongs, management, direction and control, policy, financing, both physical and psychosocial work-environments, personnel, and education/training. Many of these factors will vary considerably among different human service sectors, thus by stratifying for plausible sector differences, the estimates and relationships explored represent more specific conditions, which may relate to the impact of workplace violence. In particular, paper I, revolves around the impact of work sector, on estimates such as frequency of violence and threats, perpetrators, degree of reporting incidents, self-rated seriousness of the incidents, and attitudes about workplace violence.

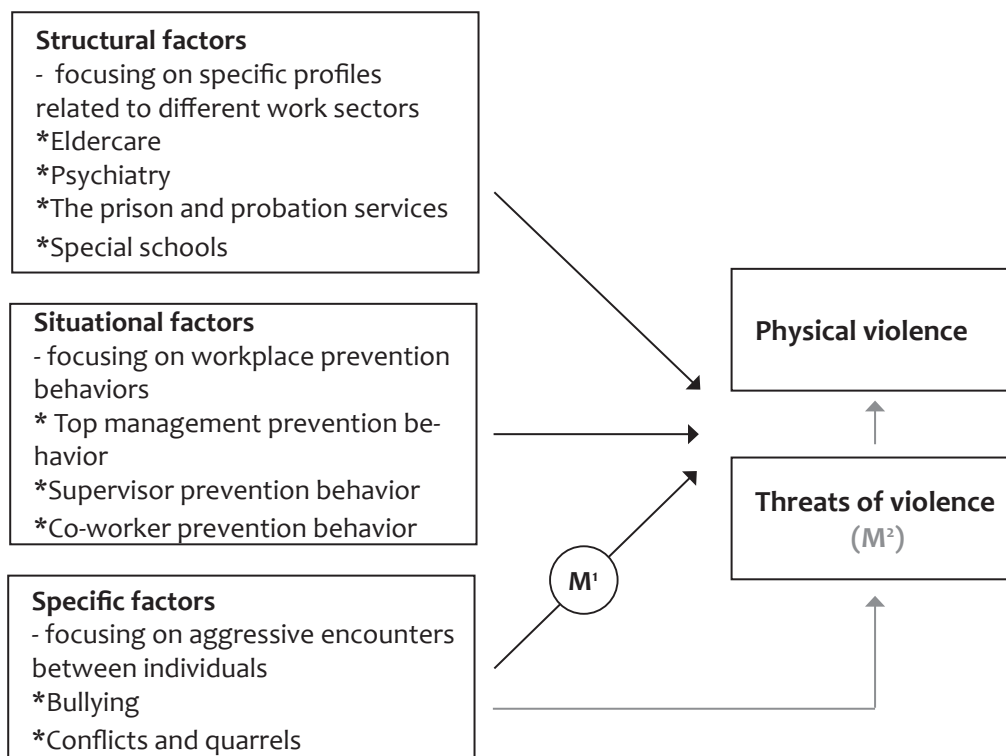
Further, Viitasara and Menckel (2002) defined a situational level of risk factors as a collection of external conditions or circumstances in a work context. This contains various work-related factors, such as work activities, work conditions, and supportive functions. Study II revolves around this situational level, in that it focuses on the impact of prevention behaviors on exposure to workplace violence at 1-year follow-up.

Lastly, according to Viitasara and Menckel (2002), the specific level refers to the actual occurrence of workplace violence, in which individual risk factors are analyzed. These include factors such as age, gender, and previous experience, and also the interaction between the parties involved. These authors note that violence in a specific situation may be the result of sequences of events, although, according to their literature search, this has received only little research interest. Paper III takes up this challenge, in that it explores a hypothetical escalatory pattern of aggression by focusing on the relationship between aggressive encounters at baseline and exposure to violence at 1-year follow-up.



In sum, the three papers conducted for this thesis may be categorized within a framework of multiple layers of risk factors associated with workplace violence. Although, each study may primarily refer to a particular level of risk, the analyses may involve factors at other levels. Study I relates the impact of the structural level, work sector, to factors at the individual level, i.e. characteristics of specific incidents such as perpetrators and self-rated seriousness, and the situational level, i.e. workplace activities such as degree of reporting. Study II analyzes the situational level, prevention behaviors, but includes the structural level by stratifying according to work sector, while also addressing factors at the individual level by adjusting for gender and seniority. Study III more explicitly focuses on the specific level by investigating the relationship between aggressive encounters, and further adjusting for gender and age. This latter study also includes testing possible mediation effects of emotional exhaustion and threats.

**Figure 1. Framework of multiple layers of factors associated with workplace violence explored in the three studies**



M<sup>1</sup>: Testing emotional exhaustion as a mediator of the relationship between bullying or conflicts and violence or threats

M<sup>2</sup>: Testing threats as a mediator of the relationship between bullying or conflicts and violence

## **Aims of the thesis**

This thesis has two main aims

1. Describe and compare sector specific profiles with regard to estimates on workplace violence.

More specifically, study I compares four human service sectors on the following estimates: frequency of workplace violence, perpetrators, degree of reporting incidents, self-rated seriousness of the incidents, and attitudes about workplace violence.

2. To analyze aspects of interpersonal behavior that may either be associated with decreased risk or increased risk of exposure to workplace violence.

More specifically, study II examines how violence-prevention behaviors among co-workers, supervisor and top-management are associated with exposure to workplace violence at one-year follow-up. This relationship is explored stratified for sector differences.

Furthermore, study III investigates the hypothesized escalating pattern of aggression by examining whether employees exposed to bullying or conflicts will report higher exposure rates of workplace violence at one-year follow-up. In addition, possible mediation effects of threats and emotional exhaustion are explored.

# **MATERIALS AND METHODS**

## **Materials**

### **Research design and Participants**

The study was conducted as a prospective study, in which participants were given a questionnaire at baseline followed by a reduced version of the same questionnaire 12 months later.

Participants of this study were employees at worksites within four areas of human service work, namely psychiatry, eldercare, prison and probations services, and special schools (schools for pupils, from five to eighteen years of age, who are affected by autism, attention deficit/hyperactivity disorder (ADHD) or general learning disabilities (mentally retarded). These sectors were chosen on the basis of existing national reports (NRCWE, 2006), which indicate high frequencies of workplace violence in these sectors. However, at the time this project started not much literature existed on special schools, and these were included on the basis of non-scientific observations.

### **Criteria for inclusion and exclusion**

Employees without client contact, who had been absent from the worksite more than three weeks prior to receiving the questionnaire, or had been employed less than three weeks at the worksite were excluded from the study. These last criterions were to ensure that employees were sufficiently aware of the present working environment. In exchange for participation each worksite was promised a status report on their psychosocial work environment; however this required a minimum of 15 employees in order to ensure confidentiality (Kristensen, 2008). Thus, in practice this was also an inclusion criterion. Eligible for the follow-up study were those employees still at the same worksite, still in jobs with client contact and no more than three weeks absence at the time of survey distribution.

## **Recruitment**

The participants working at psychiatric wards, special schools and in the eldercare were recruited using convenience sampling methodology. The research group had meetings with the top managerial level, which is in the municipal for the eldercare and counties for psychiatry; eight out of eleven municipalities decided to participate, and two of three counties accepted to participate. Hereafter local leaders were assembled and invited to participate. Four psychiatric worksites did not meet the inclusion criteria, but all other worksites were included. Special schools are organized somewhat differently, therefore, each school was directly approached. Fourteen agreed to participate in the study, two declined. With regard to the prison and probations services, the research group had a meeting with top management who accepted participation on behalf of all employees in this sector. All participating worksites sent employee records to the researchers, which included addresses, and civil registration numbers. The latter was to ensure accurate matching of questionnaires between the two rounds of data collection.

Throughout the recruitment practice it was important to ensure managerial commitment to the project, particularly since questionnaires were to be distributed and filled out during work hours.

## **Methods**

### **Data collection**

The baseline data collection took place in the period between May and October 2010 and the follow-up was conducted in the same period in 2011. A web-based questionnaire was used for participants in the prison and probations services; participants from the other work sectors received and filled out paper-and-pencil questionnaires during a planned meeting at the worksite. A researcher attended these meetings and completed questionnaires were returned to the researcher at the end of the meeting. Employees who did not participate in the meeting were asked to fill out and send the questionnaire directly to the researchers. Three reminders were sent to participants' home address and with the third reminder a new questionnaire was attached. In recognizing difficulties in getting high response rates in web-surveys (van Gelder, Bretveld, & Roeleveld, 2010), four reminders were sent to participants from the prison and probations services .

It was stated in the cover letter of the questionnaire that participation in the study was voluntary and that the data would be treated confidentially. The study was approved by the Danish Data Protection Agency, and followed the regulations for data storage and protection. Respondents were identified by questionnaire numbers, which only members of the research group could link to civil registration numbers. Data collection procedures were the same for the follow-up study, however more worksites had difficulty scheduling a meeting, and therefore more questionnaires were filled out at the employees own discretion. The study was carried out according to the Helsinki declaration of ethics.

## Measures

In the following, the main outcome and predictors are described. For further details on control variables and scaling, please see the relevant papers.

### Workplace violence

The present study included an 18-item frequency based check-list covering incidents experienced at the current worksite during the past 12 months, also used by Menckel and Viitasara (2002). The following acts of threatening behaviors were listed: threats of beatings, written threats, threats in a scolding manner, threats in an insulting manner, threats over the phone, threats involving objects, and indirect threats (toward family). Acts of physically violent behaviors included: spitting, hitting, hitting with object, scratching/pinching, shoving, being held, punching with a fist, kicking, biting, having a hard object thrown at you, and use of a weapon or weapon like object. Response options were: (1) Yes, daily; (2) Yes, weekly; (3) Yes, monthly; (4) Yes, now and then; and (5) No, never. In paper III, the threat dimension was modified, such that 'threats in a scolding manner' and 'threats in an insulting manner' were excluded. This was to minimize a conceptual overlap with quarrels or conflicts. Please see relevant papers, for more information on scaling properties and the dichotomizing of this measure. Also, please see paper I for details on items concerning perpetrator, formal reporting of incidents, self-rated seriousness of the worst incident, and attitudes about physical violence and threats.

### Violence-prevention behaviors, paper II

Prevention behaviors were defined according to different levels within an organizational hierarchy, e.g. co-workers, supervisors and top management. Three items inspired by Zohar & Luria's (2005) scale for measuring Organizational-Level Safety Climate were used to measure top management prevention behavior. Item example: (top-management) "considers violence-prevention in decisions concerning staffing and intake of clients". Supervisor prevention behavior was measured with three items from Spector and colleagues (2007). We added an item concerning supervisory support inspired by Vegchel and colleagues (2004). Thus, these items revolved around encouraging reporting incidents of threats and violence, taking these reports seriously and giving support after incidents of workplace violence. Co-worker prevention behavior was construed as identical to supervisor behavior, except for the item concerning taking reports seriously.

The items were translated into Danish. It has been suggested that persons mastering both languages should discuss and define the translation, and this translation should further be discussed by a panel of potential participants (Thor, 2005). For the current thesis, I invited a native English speaker living in Denmark for many years to translate items, I also translated the items, and we discussed our translations. Further, I discussed these items with representatives from all work sectors, mainly to ensure context-specific organizational terms for the relevant supervisor or top management. See paper II for further details on the scoring and use of this measure.

### **Bullying and conflicts at work, paper III**

Bullying and conflicts were measured using items from the second version of the Copenhagen Psychosocial Questionnaire (COPSOQ-II) (Pejtersen, Kristensen, Borg, & Bolyard, 2010). Respondents were given the following introduction to bullying: “Bullying means that a person repeatedly is exposed to unpleasant or degrading treatment and that the person finds it difficult to defend him or herself against it”. Subsequently, respondents were asked “Have you been exposed to bullying at your workplace during the last 12 months”? One item was used for conflicts and quarrels: “Have you been involved in quarrels or conflicts at your workplace during the last 12 months”? Response options were similar for both items: Yes, daily; Yes, weekly; Yes, monthly; Yes, a few times; No. Furthermore, respondents were asked: “If yes, with whom? (You may tick off more than one); Colleagues; Manager/supervisor; Subordinates; Clients/patients”.

### **Emotional exhaustion, paper III**

COPSOQ-II (Pejtersen et al., 2010) also has a dimension referred to as burnout. We used three of the four items: “How often have you been physically exhausted”?; “How often have you been emotionally exhausted”?; “How often have you felt tired”? These items reflect a state of emotional exhaustion as opposed to the depersonalization component of burnout, and therefore we label this dimension as emotional exhaustion. Response options were: All the time; A large part of the time; Part of the time; A small part of the time; Not at all.

## **Statistical analyses**

Frequencies and/or means and standard deviations were used as descriptive statistics (all papers).

### **Paper I**

This paper was mainly based on descriptive analyses. A one-way between-subjects ANOVA was used to test the differences in exposure to threats and to physical violence in the four areas of human service work. A Bonferroni-correction was used to control for multiple testing error and the significance level was set at 0.01. Pearson's product-moment correlation was computed to measure the associations between threats or violence and attitudes towards threats and violence in the workplace. SPSS 18 was used to conduct the statistical analysis.

### **Paper II**

This paper used longitudinal logistic regression. Associations were estimated by odds ratios (OR) and 95% confidence intervals. We were particularly interested in whether OR's were less than 1 indicating that prevention behaviors were negatively related to high levels of violence or threats – as opposed to low levels of violence or threats. The analyses were stratified according to sector and adjusted for gender, seniority, and baseline levels of violence or threats. SPSS 20 was used to conduct the statistical analysis.

### **Paper III**

One-way ANOVAs were preliminarily performed in order to explore the relationship between levels in emotional exhaustion according to either the frequency of bullying and conflicts or by who were involved in these behaviors. The Games-Howell post hoc procedure was used due to unequal group sizes and different population variances. The main analysis used hierarchical and longitudinal logistic regression. Associations were estimated by odds ratios (OR) and 95% confidence intervals. All analyses were



adjusted for age and gender. The analysis consisted of three main steps. In step 1, conflicts and bullying were tested as antecedents of threats or violence. In step 2, we added our potential mediator, emotional exhaustion. In the analyses concerning conflicts and bullying as antecedents of violence, we also tested possible mediation effects of threats. These possible mediators were introduced in separate steps in order to explore their unique contribution. Mediation was judged by whether or not a significant association in step 1, became insignificant when adding the mediator in step 2 (or step 2.1). This would account for perfect mediation (Baron & Kenny, 1986). Partial mediation was judged by whether the odds ratio in step 1 decreased more than 10 % after entering the potential mediator variable (Rothman & Greenland, 1998). Finally, in step 3, we controlled for the dependent variable at T1, thus ruling out the influence of the dependent variable at T1 on increased levels of the dependent variable at T2. All statistical analyses were conducted using SPSS 21.



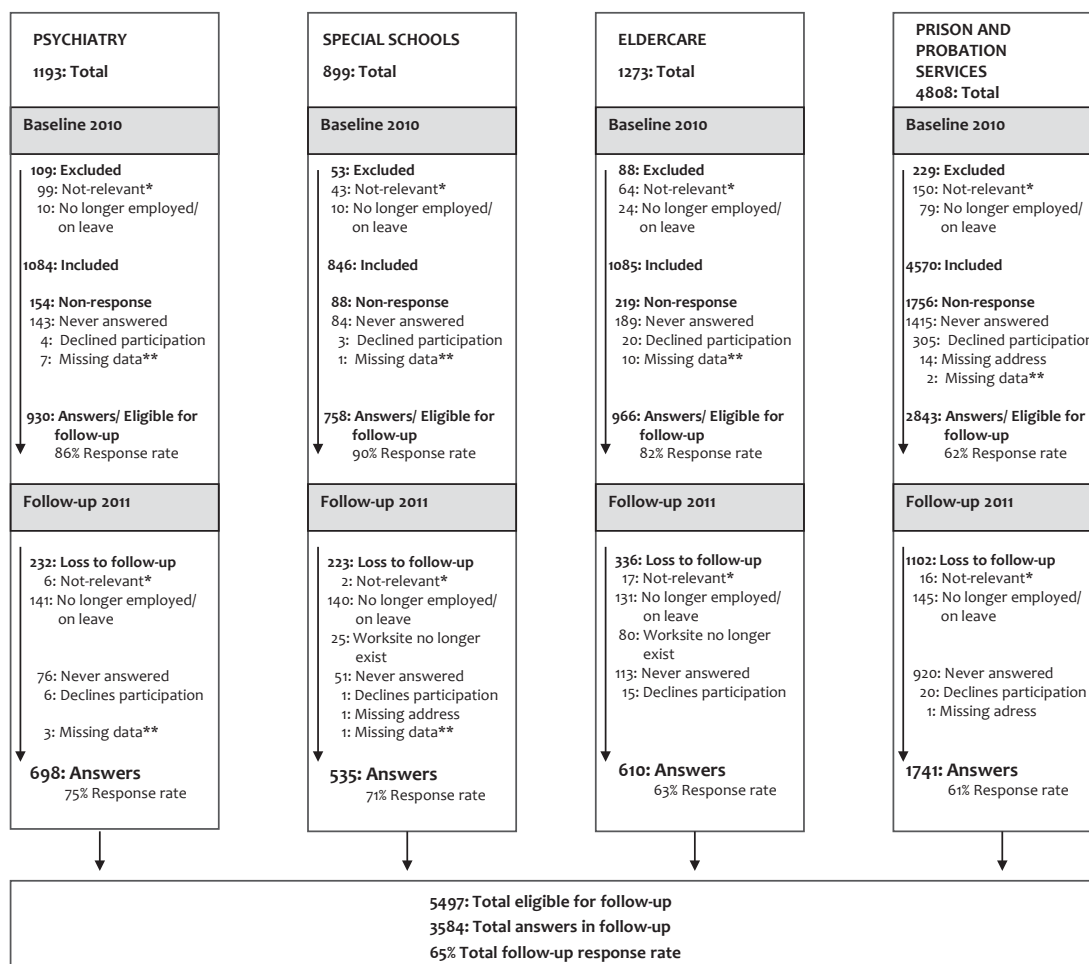
## **RESULTS**

The results presented in this section include supplementary results concerning differences between non-responders and responders, and a summary of the results presented in the three papers in this thesis. Flowchart showing participation, dropout and answering rates will be presented first. An overview of main findings concludes this section.

### **Participation and flowchart**

Figure 2 shows the flowchart of participation and dropout for both baseline and follow-up surveys. The baseline total of eligible participants reflects those employee records that were sent to the research group from participating workplaces. However, when distributing the questionnaire some employees were no longer employed or on leave, and others were excluded due to prolonged absence just prior to the time of survey distribution. Of those participants still included some declined participation, or never replied and a few were deleted due to less than 2 % answered of the total questionnaire. Response rates according to included participants were distributed in the following manner: 86% in psychiatry, 90% in special schools, 82% in eldercare, and 62% in the prison and probations services. Response rates according to those eligible for the follow-up survey were distributed in the following manner: 75% in psychiatry, 71% in special schools, 63% in eldercare, and 61% in the prison and probations services. The total participation for all work sectors consisted of 5497 eligible for follow-up, 3584 answers at follow-up, and thus a total response rate of 65%. Sample characteristics are described in the three papers; however, a supplementary overview of type of profession in each sector is presented in the appendix of this thesis. Overall, response rates were acceptable, however, the question of selection bias should be examined, and thus supplementary results on the differences between responders and non-responders will be presented in the following sections.

**Figure 2. Flowchart of datacollection and sample**



\*'Not-relevant' in this study was defined as: 1) Three weeks (or more) absence from work at time of survey distribution, 2) less than 3 week's employment (only baseline), and 3) no client contact.

\*\* Missing data: Respondent deleted due to less than 2% answered of total questionnaire.

## **Supplementary analyses**

Data from these supplementary analyses can be found in tables presented in the appendix of this thesis.

### **Non-responders at baseline**

Baseline response rates in psychiatry, special schools, and in eldercare were all very high, and therefore the possibility of selection bias is low. However, in the prison and probation services the response rate was markedly lower, which may cause selection bias. To examine this possible selection bias a comparison on available background data was made between non-responders and responders at baseline. This concerns age, gender and occupation. To determine significant differences an a priori criterion was set at 5 %, thus differences between non-responders and responders of 5% or more would signify a potential bias.

Age and gender were similar for non-responders and responders, while available information on profession revealed that all groups, except surveillance (a subgroup of 'other personnel in uniform'), were similar for non-responders and responders at baseline (see Table E). It is possible that access to a computer during work hours was particularly difficult when working in surveillance, such that responding to a web survey involved too much of a hassle. These results imply that overall the baseline prison and probation services' sample was representative for the entire sector, although one may be cautious to generalize to the group working in surveillance.

### **Non-responders at follow-up**

To ascertain possible selection bias in the follow-up sample it was examined whether non-respondents and respondents at follow-up differ on some characteristics measured at baseline, such as age, gender, seniority, and exposure to workplace violence. Again, the a priori criterion was used, such that differences between non-responders and responders of 5% or more would signify a potential bias. There were no significant differences on these measures when comparing non-responders and responders in the entire sample (see Table F). Sector specific comparisons on the above mentioned

baseline characteristic showed no significant differences between non-responders and responders at follow-up (see Tables G-I), although in the prison and probation services there was almost a 5% difference between non-responders and responders with regard to 'no violence'. This would suggest that more responders had never been exposed to physical violence. However, the overall result implies that the follow-up sample(s) are representative of the study population(s) on these main variables of interest.

## **Summary of results from the papers**

### **Paper I: Threats and Physical Violence in the Workplace: A Comparative Study of four areas of Human Service Work**

The aims of this study were 1) to investigate threats and physical violence in the workplace by comparing four areas of human service work, and 2) to compare on the following estimates: frequency of threats and of physical violence, perpetrators, degree of reporting incidents, self-rated seriousness of the incidents, and attitudes about workplace violence. The study sample was 930 employees from psychiatry, 966 employees from eldercare, 758 employees from special schools, and 2.843 employees from the prison and probation services. A total of 5.497 respondents.

Using descriptive statistics the results showed that the most frequent types of threats across all four sectors were 'threats in a scolding manner' and 'threats in an insulting manner'. Special schools and psychiatry had higher frequencies of threats compared to eldercare and the prison and probation services. Descriptive statistics also showed that physical violence was more frequent in special schools than in any other sector. Psychiatry also had a relatively high degree of occasional violence, while employees in the prison and probation services were the least exposed to both frequent and occasional violence. Overall, threats had higher frequencies than physical violence. Results from the one-way ANOVA revealed that these differences in the frequency of threats and violence between the four human service sectors were statistically significant, except for eldercare and the prison and probation services, who were similar with regard to exposure to threats. Please see overview tables 1 and 2 for further results on perpetrators, degree of reporting incidents, self-rated seriousness, and attitudes that reflect accept of workplace threats and violence.

## **Paper II: Effects of Violence Prevention Behavior on Exposure to Workplace Violence and Threats: A Follow-up Study**

The aims of this longitudinal study were 1) to analyze how violence-prevention behaviors are associated with exposure to violence and threats at follow-up, and 2) to explore possible differences in the relationship between violence prevention behaviors and exposure to violence or threats across different work sectors. In this study all those with supervisory responsibilities at both line and top management level were excluded, seeing that perception of management was of main interest; thereby the study sample consisted of 617 employees from psychiatry, 577 employees from eldercare, 511 employees from special schools, and 1.311 employees from the prison and probation services. A total of 3.016 respondents.

Descriptive statistics for the cumulative frequency of threats and violence across sectors showed a similar pattern of relative sector profiles as found in paper I. Longitudinal logistic regression analyses adjusted for seniority, gender, and baseline exposure showed that prevention behaviors were negatively associated with threats and violence at 1-year follow-up – in the prison and probation services, eldercare, and in psychiatry, while no significant associations were found for special schools. Odds ratios for these results are presented in the overview tables 1 and 2.

## **Paper III: A longitudinal study of the possible escalation of aggressive behaviors - from bullying and conflicts to workplace violence. Is emotional exhaustion a mediator?**

The aims of this longitudinal study were 1) to explore the hypothesized escalatory pattern of aggressive behaviors by investigating whether bullying or conflicts are antecedents of threats of violence and physical violence, 2) to explore whether threats mediate the relationship between bullying or conflicts and physical violence, and 3) to explore whether conflicts and bullying are indirectly linked to threats and violence through the effect on strain (emotional exhaustion). This study sample consisted of 3.584 employees.

Descriptive statistics on perpetrators showed that clients were involved in the majority of conflicts and incidents of workplace violence, indicating a similar victim-perpetrator relationship between these types of aggressive incidents. Bullying and incidents of workplace violence, however, did not involve the same victim-perpetrator relationship, in that bullying most often involved other employees. Results of the one-way ANOVA

showed that higher frequencies of both bullying and conflicts were related to increased levels of emotional exhaustion. Results from hierarchical and longitudinal logistic regression analyses adjusted for age, gender, possible mediation effects, and baseline exposure showed that conflicts, not bullying, at baseline were significantly related to higher self-rated exposure rates of threats and violence at follow-up. There were no mediation effects by emotional exhaustion; however, threats were a significant partial mediator of the relationship between conflicts and violence. Odds ratios for these results are presented in the overview tables 1 and 2.



Table 1. Threats of violence. Overview of main findings

	Variables of interest	General trends	ELDERCARE	PSYCHIATRY	SPECIAL SCHOOLS	PRISON AND PROBATION SERVICES
<b>Baseline</b>	Frequency	Eldercare and the prison and probation services were not statistically significant different	Lowest overall level	Second highest overall level	Highest overall level	Lowest overall level
	Item example: 'Threats of beatings' [n (%)]		908 (21.9)	896 (50.8)	733 (55.6)	2732 (20.6)
	Perpetrators	≥ 90% from clients				
	Reporting 'no reporting'	Less exposure was related to less reporting	58.3 %	30.6 %	35.8 %	47.0 %
	Seriousness (scale from 1 to 10)	All ratings were within the moderate range. Seriousness was not consistently reflected in frequency level.	4	6	5	5
	Attitudes – both violence and threats.	Accepting attitudes were not consistently reflected in frequency level. Stronger negative associations between attitudes and threats than between attitudes and violence	Least agreement with accepting attitudes	Second least agreement with accepting attitudes	Most agreement with accepting attitudes	Second most agreement with accepting attitudes
	Prevention behavior	Significant preventive effects for three of four work sectors	(OR=0.75, CI=0.57-0.996)	(OR=0.58, CI=0.43-0.80)	(OR=0.94, CI=0.66-1.34)	(OR=0.81, CI=0.67-0.98)
	Top management					
	Prevention behavior Supervisor	More similar frequency levels of threats between eldercare and the prison and probation services may explain the similar preventive effects	(OR=0.64, CI=0.47-0.89)	(OR=1.30, CI=0.91-1.86)	(OR=1.10, CI=0.76-1.59)	(OR=0.58, CI=0.47-0.72)
	Prevention behavior Co-worker		(OR=0.68, CI=0.53-0.87)	(OR=1.01, CI=0.70-1.42)	(OR=1.34, CI=0.94-1.88)	(OR=0.62, CI=0.49-0.78)
<b>Follow-up</b>	Bullying as risk factor	No significant associations 70% of perpetrators of bullying were other employees	-	-	-	-
	Conflicts and quarrels as risk factor	Occasional conflicts: (OR=3.14, CI=2.09-4.73) Frequent conflicts: (OR=4.98, CI=3.19-7.76) 70% of perpetrators of conflicts were clients	-	-	-	-
	Emotional exhaustion as a mediator of the relationship between bullying or conflicts and threats	No mediation effect (Higher frequencies of both bullying and conflicts were related to increased levels of emotional exhaustion)	-	-	-	-

Table 2. Physical violence. Overview of main findings

	Variables of interest	General trends	ELDERCARE	PSYCHIATRY	SPECIAL SCHOOLS	PRISON AND PROBATION SERVICES
<b>Baseline</b>	Frequency	The frequency of physical violence was statistically significantly different among the four work sectors	Second lowest overall level	Second highest overall level	Highest overall level	Lowest overall level
	Item example: 'Being kicked' [n (%)]		911 (15.1) ≈ 90% from clients	899 (27.4) > 90% from clients	745 (54.6) > 90% from clients	2732 (2.9) 74% from clients
	Perpetrators		53.5 %	23.4 %	25.2 %	48.6 %
	Reporting 'no reporting'	Less exposure was related to less reporting				
<b>Follow-up</b>	Seriousness (scale from 1 to 10)	All ratings were within the moderate range. Seriousness not reflected in frequency level	4	6	5	6
	Attitudes – both violence and threats.	Accepting attitudes were not consistently reflected in frequency level Stronger negative associations between attitudes and threats than between attitudes and violence	Least agreement with accepting attitudes	Second least agreement with accepting attitudes	Most agreement with accepting attitudes	Second most agreement with accepting attitudes
	Prevention behavior		(OR=0.94, CI=0.91-1.03)	(OR=0.69, CI=0.52-0.92)	(OR=0.94, CI=0.66-1.34)	(OR=0.90, CI=0.74-1.10)
	Top management		(OR=0.53, CI=0.35-0.80)	(OR=0.52, CI=0.30-0.89)	(OR=1.10, CI=0.76-1.59)	(OR=0.78, CI=0.63-0.98)
	Prevention behavior Supervisor	Significant preventive effects for three of four work sectors	(OR=0.61, CI=0.44-0.84)	(OR=0.72, CI=0.52-0.98)	(OR=1.33, CI=0.94-1.88)	(OR=0.77, CI=0.60-0.99)
	Prevention behavior Co-worker	More similar frequency levels of violence may explain the similar preventive effects among sectors				
	Bullying as risk factor	Frequent bullying: (OR=0.23, CI=0.09-0.55) 70% of perpetrators of bullying were other employees				
	Conflicts and quarrels as risk factor	Occasional conflicts: (OR=1.77, CI=1.19-2.63) Frequent conflicts: (OR=3.01, CI=1.96-4.76) 70% of perpetrators of conflicts were clients				
	Emotional exhaustion as a mediator of the relationship between bullying or conflicts and threats	No significant mediation effect (Higher frequencies of both bullying and conflicts were related to increased levels of emotional exhaustion)				

## **Discussion**

The discussion is structured according to the three levels of analysis presented in the framework for this thesis, i.e. structural, situational, and specific. The discussion will revolve around sector profiles and interpersonal factors associated with risk of workplace violence, while some of the more specific results are discussed in the relevant papers. The discussion also includes a section on methodological issues.

### **The impact of structural factors**

#### **Sector specific profiles – frequencies of violence and threats**

The results presented in paper I show that eldercare, special schools, psychiatry, and the prison and probation services are all at risk of workplace violence; however, the frequency of exposure differs statistically significantly between these work sectors. Seeing that we included special schools based on observational reports and not on existing scientific literature, it was somewhat surprising that this sector was the most exposed. However, later studies have shown that special education teachers are at a significantly higher risk in comparison to other education workers (Tiesman et al., 2013; Gerberich et al., 2011). Furthermore, it was expected that the prison and probation services would have a more distinct risk profile in that clients in this sector often have a prior history of violence and that the primary task for employees is controlling, restricting and confining clients (Bensley, Nelson, Kaufman, Silverstein, & Shields, 1995; Lanza & Kayne, 1995; Lanza, 1988). However, the existing literature is conflicting. It has previously been shown that prison guards have higher levels of violence in comparison to other occupational groups, but this result was based on 349 cases of persons exposed to violence, of which 13 cases were prison guards (Salminen, 1997). Other studies on exposure rates within the prison and probation services are based on objective reports, such as injury

data (Konda et al., 2013) or compensation claims data (Safran & Tartaglini, 1998), which are difficult to compare to self-report data.

The National Research Centre for the Working Environment (NRCWE) in Denmark monitors workplace violence by use of self-report data, and data collected in 2014 show that the frequency of threats was the highest for police and prison guards (54.0%, N:84), while other occupational groups from the four work sectors also were within the most exposed groups: special social educators (47.9%, N:338), care worker assistants (34.2%, N:791), special education teachers (25.5%, N:87), and nurses (25.4%, N:658)(NRCWE, 2015). The frequency of violence was 38.6% (N:338) for special social educators, 33.6% (N:791) for care worker assistants, 33.3% (N:84) for police and prison guards, 19.3% (87) for special education teachers, and 16.6% (N:658) for nurses. The overall frequency for all occupational groups was markedly lower, i.e. 5.8% for violence and 8.4% for threats (NRCWE, 2015).

The sector specific profiles found in paper I have consequences for the interpretation of these results from NRCWE. First, it should be cautioned to cluster police and prison guards in the same occupational group, seeing that, in the present study, frequencies of threats and particularly violence were lower in the prison and probation services than in other sectors. Although this sample consists of other than prison guards, it does represent 70% of personnel in uniform, and the sample is reasonably representative for the entire sector. Thus, this indicates that structural factors related to police work in contrast to work in the prison and probation services may involve heightened risk of workplace violence. One difference between these work sectors is that police officers work in the field and often have short interactions with civilians (Euwema, Kop, & Bakker, 2004); these structural qualities may entail less predictability and less opportunity to install preventive strategies. Second, although NRCWE recently have distinguished between teachers in general and special education teachers, the latter category also encompasses teachers of music, arts and information technology, which does not represent client groups with special needs as a results of psychological deficits. Third, it should be cautioned to regard general occupational categories such as nurse without specifying the type of work sector in which they are employed. Nurses constitute a third of the participants in the present psychiatry sample, which is the second most exposed sector in the present study. High prevalence rates were somewhat expected in this sector since research shows that nurses, particularly in psychiatric facilities, are at high risk of workplace violence (Hodgson et al., 2004; Lee, Gerberich, Waller, Anderson, & McGovern, 1999; Spector et al., 2014). In contrast, the NRCWE data show that nurses

have lower frequencies of violence and threats than for example police and prison guards. Moreover, the available NRCWE data on sector does not include a category for psychiatry, but offers a general category for hospitals, which covers a wide array of patients groups. In contrast, the present study has defined sector in accordance with similar client groups as structural, situational, and specific factors associated with workplace violence are assumed to vary among different work settings as a function of specific interpersonal challenges and treatment goals. Thus, the current findings suggest that monitoring frequencies of workplace violence should include sector as well as occupation, in addition to defining sector more specifically in relation to type of client, such as psychiatry.

### **Explaining differences between sectors**

Trying to understand these sector specific profiles entails comparing structural qualities between these work sectors that may relate to the differences in self-reported exposure to workplace violence. One possible explanation for the finding that employees in the prison and probation services are the least exposed may be that aggressive behavior toward prison staff entails specific sanctions (i.e. prolonged sentence), which may prevent incidents of physical violence. In addition, most inmates are supposedly of a “sane mind” (in a legal terminology) in comparison to clients in psychiatry, special schools, and elderly clients with dementia, who may not be able to understand the consequences of their actions or to resist their impulses.

The high levels of self-reported exposure to workplace violence in special schools may be due to a less distinct tradition for violence prevention, given that at the time of data-collection there was limited knowledge on the scope of workplace violence in this sector. However, another possible explanation may be that the relationship with students is qualitatively different, in so far as employees may regard themselves as caregivers in a sort of parenting way, and thus the student as someone to protect and not to be protected from. Labeling or pushing aside incidents as violence has been studied by Åkerström (2002), who describes a tendency to determine what a phenomenon is according to who is involved instead of what he or she does. How clients are typified may influence the interpretation of actions thereby also affecting (preventive) reactions. In this context, special school students may be associated with childhood innocence and special needs, which evokes protective urges, sympathy and a professional identity as caretaker of those special needs. Thus, defining the actions of special students as

violence may put professional skills in question, thus deterring defining it as violence. However, Åkerström (2002) showed that nurses working in eldercare also reluctantly use the term violence to cover elderly people's physical aggression. Thus, downplaying violence is not unique for employees in special schools and cannot explain differences in exposure, particularly since sector profiles of special schools and eldercare are at opposite ends with respect to the frequency of workplace violence. In fact, this downplaying may reflect that the elderly (frail) and children (innocent) do not conform to the common cultural script of violent perpetrators, who should be young men, drug abusers or alcoholics, schizophrenics, and/or criminals (Åkerström, 1993). Although employees in both sectors may restrain from labeling aggression as violence, they have qualitatively different objectives when responding to these incidents. Employees in special schools assess the students' developmental and learning goals, while employees in eldercare assess the deterioration of mental capacities. In the latter case, employees cannot change the deterioration but may try dealing with it differently. In special schools, employees have a professional stake in learning objectives and thus may take a more proactive stance on adjusting demands but still challenging the student. These sector specific factors may affect differences in exposure to workplace violence.

Professional identity may also be closely related to the image of the job as dramatic and dangerous, as Åkerström experienced when a police officer indignantly commented that aggressive acts from the elderly in nursing homes were not violence (2002). During the course of the current study, the prison and probation services similarly reacted to the image of being the least exposed to workplace violence. Again, this reflected efforts to define violence according to who is involved instead of what he or she does, and furthermore questions whether aggression from a student, an elderly, a psychiatric patient, and an inmate is sufficiently comparable in order to be labeled violence. This relates to the discussion of determining the seriousness of threats and violence.

### **What is at stake? – sector differences with regard to seriousness of incidents**

Some researchers define violence according to physical or mental consequences (Carmel & Hunter, 1989; Caldwell, 1992); however, studies show that more physical aggression does not necessarily imply more severe consequences. For example, results show that bullying as opposed to threats and (non-fatal) violence involves greater risk of turnover and long-term sickness absence (Clausen, Høgh, & Borg, 2012; Clausen, Høgh,

Carneiro, & Borg, 2013). Research on PTSD has found that the traumatic nature of an event does not necessarily predict levels of symptomatology; indeed, participants with a non-traumatic event, in comparison to those with a traumatic event defined by the DSM-IV-TR, may either score the same or show more severe levels of symptoms (Gold, Marx, Soler-Baillo, & Sloan, 2005; Cameron, Palm, & Follette, 2010). Given that even minor incidents of workplace violence may result in trauma reactions, it may be the perception of threat (potential of harm) in a violent incident, and not merely type of aggression or physical injury, that implies severity of reactions (Whittington & Wykes, 1989).

Results from paper I show that the seriousness of the most serious incident is comparable between sectors, i.e. within 4-6 on a scale from 1 (not serious) to 10 (extremely serious). However, an extremely serious incident in for example special schools may not objectively equal an extremely serious incident in the prison and probation services, and therefore the interpretation of the scale may not be comparable between sectors. Despite this, the self-rated seriousness does represent a subjective account of the impact of violence, which indicates the perceived threat in a given situation. Thus, within the moderate range, employees in eldercare perceive the least fear, while employees in psychiatry overall perceive the most fear. Although the elderly may be perceived as having little strength, and thereby no need to fear harm, this is countered by accounts of “the seniles” having special strength and that nearly every fourth nursing home employee have been afraid of certain patients (Åkerström, 1993; Åkerström, 2002). Similarly, special school students may express special strength, and I myself have observed a situation in which it took three adults to secure an enraged 14-year old girl with autism. This also corresponds to the finding that threats of violence involve similar levels of seriousness for employees in special schools and the prison and probation services. However, physical violence was rated more seriously in the prison and probation services than in special schools, which is expected since facing violent adult criminals – sometimes convicted murderers – is likely to entail (extreme) fear. Further, that seriousness is rated highest overall in psychiatry, with equal ratings of seriousness of physical violence as the prison and probation services, may reflect that some psychiatric patients are also criminals.

In sum, while a higher rating of seriousness of physical violence may reflect a certain type or strength of perpetrator, e.g. an adult inmate/psychiatric patient, this is not consistent for ratings of the seriousness of threats of violence. Albeit, this thesis cannot determine the relative sector profile with regard to the relation between subjective

seriousness and potential consequences of workplace violence. However, comparing these sectors on the frequency of specified aggressive acts visualizes the relative challenges with regard to managing and preventing workplace violence.

## **The impact of situational factors**

### **The effect of prevention behaviors on risk of workplace violence**

One overall aim of this thesis was to analyze interpersonal behaviors that may decrease the risk of workplace violence. To this end, violence prevention behaviors at three organizational levels, i.e. top management, supervisor, and co-worker, were investigated. The results showed that prevention behaviors were significantly and negatively associated with self-reported exposure to workplace violence and threats. This corresponds well with evidence from existing cross-sectional studies (Gimeno et al., 2012; Kessler et al., 2008; Lipscomb et al., 2012; Spector, Coulter, Stockwell, & Matz, 2007). However, the results are not similar to those from the existing longitudinal study, which show no significant associations between the dimension of practices and responses and risk of physical violence (Yang et al., 2012). This difference in effects may relate to the different study populations, where the current study has chosen high-risk sectors in which violence-prevention is expected. Moreover, it is possible that the current study found more significant effects due to the inclusion of social support. In theory, social support may reduce future exposure by alleviating the victim's symptoms of strain. These various strains may reduce capabilities to comply with prevention policies (Chang et al., 2012) and may increase aggressive outburst due to a lack of mental resources (Aquino & Thau, 2009; Felson, 1992). Therefore, the present findings indicate and elaborate on the important role of supervisor and co-worker responses after exposure to violence and threats (Schat & Kelloway, 2003; Leather et al., 1998).

### **Sector specific prevention effects and/or general trends**

Although the study of prevention behaviors revolve around the situational level of analysis, i.e. workplace routines, activities, and supportive functions, the study also included the structural level, i.e. sector difference. This allowed for identifying different and similar



trends in preventive effects across sectors.

No results on special schools were significant and only by controlling for the baseline measure of self-reported exposure did model-fit indices reach significant  $\chi^2$ . This suggests that prevention behaviors, in this sector, do not fit the hypothesized model. This may relate to the former discussion regarding downplaying violence and interpreting prevention more in terms of adjusting learning objectives.

The pattern of significant preventive effects was exactly similar for eldercare and the prison and probation services. In these sectors, supervisor and co-worker prevention behaviors were associated with decreased risk of physical violence and threats, while top management prevention behavior was only significantly associated with decreased risk of threats. For these sectors, prevention behaviors were overall more effective for reducing threats than physical violence. In psychiatry, on the other hand, prevention behaviors were overall more effective for reducing physical violence than threats. Only top management prevention behavior was associated with decreased risk of threats, while all three prevention behaviors were associated with decreased risk of violence.

The similar trend of preventive effects between the prison and probation services and eldercare may reflect more similar frequencies of threats and violence. Thus, top management prevention behavior may not be effective with relatively low exposure levels, such as violence in these sectors. Conversely, top management prevention behavior may be the only prevention behavior that is effective with relatively high exposure levels, such as threats in psychiatry. This pattern may reflect that the high frequency of threats is related to staffing norms and the intake of patients, thereby amenable only to top management prevention behavior (OR = 0.58). Overcrowding and staffing norms have been widely debated in Denmark due to many financial cut-backs in hospitals and long wait-list for psychiatric treatment. Moreover, given the high frequencies of threats, employees and supervisors may tacitly accept that it is not feasible nor necessary to formal report incidents, given that it is very time consuming (Beale, Cox, & Leather, 1996). Conversely, the findings suggest that with a moderate to low exposure level of both threats and violence, supervisors and co-workers may be effective in reducing future exposure. This effect may be related to the impact of frequent prevention-oriented interactions among employees sharing day-to-day working life, in contrast to more seldom interaction with top-managers (Zohar & Luria, 2003; Zohar & Luria, 2005). Thus, low exposure levels may not be communicated to top-management, thus not requesting any action, in contrast to moderate to frequent exposure, where structural changes may be requested and adhered.

In sum, the above findings show differential effects of prevention behaviors across organizational position, i.e. top management, supervisor, and co-worker. Multi-sector comparison suggests that the differential effects of specific prevention behaviors may be related to the frequency of workplace violence and threats.

## **The impact of specific factors on workplace violence**

### **Interpersonal escalating patterns of aggression: from bullying and conflicts to workplace violence.**

Another overall aim of this thesis was to analyze interpersonal behaviors that may increase the risk of workplace violence. To this end, the hypothesized escalating pattern of aggression was examined. It was explored whether non-physical aggression, defined as bullying or conflicts, progresses to threats of violence and physical violence. This analysis pertains explicitly to the specific level of analysis, in that it focuses on aggressive encounters between individuals. The results showed that conflicts and quarrels at baseline were significantly related to higher self-reported exposure rates of threats and violence at follow-up, while this was not the case for bullying. Moreover, threats was a significant partial mediator of the relationship between conflicts and violence, thus confirming an ordered progression from less to more physical aggressive behaviors.

Type of perpetrator relationship may explain differences in significant associations for conflicts and bullying. While conflicts primarily involved clients, bullying primarily involved other employees. Thus, given that clients were almost exclusively reported as perpetrators of violence and threats, the association between conflicts and threats/violence may reflect a more closed circuit of interpersonal escalating and reciprocal behaviors. This result is in line with other studies on escalating aggression, which also find target-specific escalation (Dupré & Barling, 2006; Felson & Steadman, 1983; Glomb, 2002; Murphy & O'Leary, 1989).

The results on bullying imply that pent-up aggression from one context (bullying from employees) was not displaced against unassociated targets (clients). As such, this longitudinal study could not replicate findings from the cross-sectional study by Lanza & colleagues (2006), which suggested an association between being exposed to non-physical aggression by employees and being exposed to physical aggression by clients.

This may be explained by differences in measures and study populations. However, the current results did confirm that non-physical violence is a risk factor for physical violence in the client-employee relationship.

### **The nature of the client-employee relationship**

In many human service and caring industries the task of setting limits for clients is a central job task. Specific situations may involve enforcing smoking rules, requesting patients to go to certain areas or not eat or drink certain foods, and also assisting with activities of daily living (ADL), such as to dress, shower, move from one position to another such as from chair to bed. These situations have been identified as risk factors for assault (Bensley et al., 1995; Lanza & Kayne, 1995; Lanza, 1988). Setting limits may be regarded as a blocking or thwarting of ongoing goal-directed behavior, which results in frustration inducing an instigation toward aggression directed at the employee (Dollard et al., 1939). This suggests that, in contrast to working relationships, an inherent feature of the client relationship may involve risk of conflict and escalating aggression. Moreover, employees may perceive clients' aggression as a result of illness (Åkerström, 2002), which as mitigating information may lessen the degree of frustration, negative affect and aggressive behavior on the part of the employee (Berkowitz, 1989). However, qualitative results from Åkerström's (2002) study on nurses showed that after experiencing aggression many times, it became more difficult to see aggression as an illness. And after a while they would use more stern replies to this behavior. These findings are in line with the current results on the accumulation and escalation of aggressive behaviors. According to the revised theories of Frustration Aggression (Berkowitz, 1989; Fox & Spector, 1999) and the circular model of aggressive encounters and burnout (Winstanley & Whittington, 2002), the effect of accumulating aggression is mediated by accumulated negative affect or burnout.

### **Emotional exhaustion as mediating factor**

The investigation of the hypothesized effect of burnout, more specifically the dimension of emotional exhaustion, confirmed that experiences of bullying and conflicts were associated with increased levels of emotional exhaustion. However, these levels of emotional exhaustion did not mediate the association between neither bullying nor conflicts and threats and violence. With regard to conflicts, this lack of significant

mediation may be due to insufficient levels of emotional exhaustion in order to influence behavior. In fact, the mean level for the emotional exhaustion scale was 32, while the most intense level for conflicts was about 37.9. In contrast, bullying experiences showed by far more taxing levels of emotional exhaustion. These differences in strain may be due to different opportunities to cope with the negative encounters. In a client-related interpersonal conflict, negative affect or burnout may be mitigated by understanding aggression as illness (cognitive appraisal) (Berkowitz, 1989; Chapman, Styles, Perry, & Combs, 2010; Åkerström, 2002), while also getting support from co-workers, thus buffering strain responses (Frese, 1999; Schat & Kelloway, 2003). In contrast, bullying experiences may obstruct sources of intra-organizational support and induce negative feelings of being ostracized, thus intensifying strain responses (Matthiesen & Einarsen, 2010; Zapf & Gross, 2001). However, even rather high levels of emotional exhaustion related to bullying at baseline did not mediate the risk of threats or violence at follow-up. This may again reflect that aggression, despite high strain, may not be displaced among the different perpetrator relationships in question. It may be that targets of bullying have qualitatively different client relationships in comparison to employees involved in ongoing conflicts with clients. Targets of bullying from co-workers may appraise being with clients as their “safe-zone” in contrast to employees in ongoing conflicts with clients.

The current findings on escalating aggression from conflicts to threats and to violence may therefore not be explained by emotional exhaustion as mediator. However, this study cannot ascertain the probable build up of frustration, negative affect and aggressive drive on the part of the client. It may be that some clients continuously instigate conflicts as a result of this build up, and therefore target certain employees who must continuously set limits for this behavior; thereby constituting a negative pattern of escalating aggression. This underlines the importance of relevant coping opportunities for targeted employees, given that more strain is to be expected in a context with inadequate supportive functions (Frese, 1999; Schat & Kelloway, 2003).

### **Preventing escalation of aggression**

Although escalation pertains to reciprocal behaviors (Andersson & Pearson, 1999; Felson & Steadman, 1983; Glomb, 2010), in the client relationships there may not be equal responsibility for the exchange of behaviors. In contrast to co-worker relationships, the de-escalation of a conflict may rest more on one party of the exchange, namely

the employee. Thus, irrespective of the instigation or cause of the conflict, employees may be required to competently de-escalate the situation (Fauteux, 2010). However, the current results (paper III) should be interpreted with caution, so as to not further assign responsibility of victimization on the victim, but rather focus on the role of the workplace in preventing future aggression from clients. As such, worksites may offer training in verbal and physical management of clients (Wassel, 2009). Moreover, worksites should have violence prevention policies and practices, where formal reporting of incidents are encouraged and taken seriously (Chang et al., 2012; Kessler et al., 2008; Spector et al., 2007). The results from paper II indicate that effective violence prevention further entails specific prevention behaviors at top management, supervisor, and co-worker level, which include social support from the latter two levels. Furthermore, findings from paper II show that these behaviors may have preventive effects on both threats and physical violence, which underscore that these aggressive acts are closely intertwined (Lanza, Zeiss, & Rierdan, 2006). This implies that by preventing conflicts and/or threats of violence you may also prevent acts of physical violence, thus putting an end to a possible escalating pattern of aggression.

## **Methodological issues**

### **Participation**

The response rates were high and above mean in comparison to organizational surveys (Baruch & Holtom, 2008), particularly in psychiatry, special schools, and eldercare. Thus, these sectors were reasonably representative of all employees from the participating workplaces. Response rates in the prison and probations services, however, were somewhat lower. This may be explained by the use of web-surveys (van Gelder et al., 2010) and that participation was a top-down decision from the highest level of management, without involving specific institutions. However, analyses of non-responders in the prison and probation services at baseline showed no selection bias according to background information on non-responders and responders at baseline; except for the occupational group of surveillance. This suggests that the sample is reasonably representative for the entire population. Moreover, across all sectors, non-response at follow-up showed no significant selection bias on main descriptives such as age, gender, seniority, or our main outcome variables, violence and threats of violence;

although, the results on the prison and probations services indicate a slight tendency toward an underestimation of workplace violence. These results specify the context for generalization, and thereby strengthen the external validity of our findings.

The use of convenience sampling, in psychiatry, special schools, and eldercare, is primarily valid when the objective is to investigate tendencies and not to generalize to the general public (Nielsen & Einarsen, 2008). The study goal of paper I was to explore tendencies within and across work sectors, thus the use of this sampling method was of less concern. Paper II, showed similar findings between particularly eldercare and the prison and probations services suggesting that sampling procedures may not infer substantial bias for the associations explored. In paper III, the main concern was that 50% of the study sample was from the prison and probations services, which questions whether the associations are more relevant for this sector than the other three sectors. However, as this study investigates behaviors that are more individual-specific than context-specific, it is plausible that the associations are relevant for the entire sample. However, tentative generalization of these findings should only pertain to employees in human service sectors.

## **Study design**

### **Cross-sectional study**

Paper I was based on the baseline study and thus a cross-sectional study. The study did not entail hypothesis testing and therefore did not propose any directionality in relationships, which would have been biased due to measuring both predictor and outcome at the same time-point. However, the correlation analyses concerning attitudes and exposure to workplace violence should be interpreted with caution in that we cannot conclude directionality. Thus, although the paper suggest that changing attitudes about workplace violence may influence incidents of threats and violence, this may indeed be the reversed relationship. However, results also showed that sectors with the highest and lowest levels of workplace violence both had the most agreement with accepting attitudes, indicating that degree of exposure is not the main source of influence on attitudes.

### **Time span**

The optimal time span from baseline to follow-up should represent the 'true' time lag of the underlying causal process; however, we have little information about the 'right'

length of time lags in occupational research (Zapf, Dormann, & Frese, 1996; Tang, 2014; De Lange, Taris, Kompier, Houtman, & Bongers, 2004). In theory, if the time-lag is too short, meaningful effects of interpersonal behaviors may not have sufficiently unfolded. On the other hand, an excessively long time-lag may provide more opportunities for individual adaptation or organizational changes that could negate the anticipated associations. A one year follow-up was chosen since this has been recommended in relation to psycho-social work environment and mental health (De Lange et al., 2004).

### **Follow-up study**

The longitudinal design means that predictors and effects are assessed at independent time-points. In papers II and III, the analyses of the associations between predictors and outcome were longitudinal, and since baseline levels of the outcome were included (adjusted for) in the analyses, we are more confident in the direction of the associations from predictor to outcome. However, ideally, including a third (or more) time-point(s) would have strengthened our results, given that changes from T1 to T2 is by default linear (i.e., a straight line), and it is impossible to determine the form of change over time (Rogosa, 1995). It is merely an increment of difference between two times, and thus we cannot assess whether change was steady or delayed or whether it plateaued and then changed again (Singer & Willett, 2003). In the case of prevention behaviors (Paper II), more time-points could have shown whether fluctuations in frequencies of workplace violence were indeed related to changes in the preventive effects of prevention behaviors. In the case of escalating aggression (Paper III), more time points with shorter intervals might have shown a pattern of upward and downward spiraling aggression (Andersson & Pearson, 1999). However, the study goals of the present studies were not to determine this change over time, and future studies are needed to investigate these issues.

Although more time-points could have strengthened the results, the multi-sector angle of study II, shows consistent results across three different work sectors, which gives strength to the validity of the results. Further, in study III, results show dose-response relationships in that more frequent conflicts are associated with higher levels of workplace violence. In addition, the Nagelkerke estimates show that 40-50% of variance is explained by the models in study III, while this is 30-40% in study II. Thus, despite limitations, the follow-up studies show consistency, a dose-response curve, and considerable variance explained; these aspects represent criteria's from the Bradford Hill list concerning causality (Hill, 1965), however, the aspect of 'consideration of alternate

explanations' may not be sufficiently explored. I will return to this issue under "Issues of confounding".

## **Measures**

### **Self-report and recall bias**

Among the limitations of this study is that all data was drawn solely from retrospective self-reports of employees, potentially resulting in errors arising from recall problems and under- or over-reporting. Figures on self-reported exposure to workplace violence have shown to greatly exceed the number of incidents reported to the workplace due to a general underreporting of incidents (Beale et al., 1996; Gifford & Anderson, 2010; Snyder et al., 2007; Sharipova et al., 2008). However, research on work-related injuries suggests that when recall is not facilitated by previous diary activities, underreporting in retrospective questionnaires will be greater the longer the recall period used (Andersen & Mikkelsen, 2008). Thus, it is unclear whether retrospective self-report of workplace violence is under- or over-reporting due to issues of recall bias and a general underreporting of incidents, and future studies may compare questionnaires, diaries, and internal reporting systems to clarify the subject.

Self-report data of independent and dependent variables also involves the risk of common method variance leading to an inflation of the reported associations due to an uncontrolled third variable (Zapf et al., 1996). Third variables may depend on the method, such as social desirability, or may be independent of the method but the effects are carried over time; that is, the correlation between variables T1 and T2 may be exaggerated. Examples of these more stable third variables may be sociodemographic variables such as age, gender, education (Zapf et al., 1996), or personality traits such as negative affectivity (Bowling & Beehr, 2006). The current study did not adjust for social desirability or personality factors, and this may thus be a limitation, although the approach is consistent with other studies on workplace violence and violence prevention climate (Kessler et al., 2008; Spector et al., 2007; Yang et al., 2012). Further, we considered the issue of over-adjusting, which I will return to under "Issues of confounding".

### **Measuring workplace violence and threats**

The National Research Centre for the Working Environment (NRCWE) in Denmark use self-report data to monitor workplace violence, by use of these two items 'have you



been subject to violence' and 'have you been subject to threats of violence', thus these measures entail subjective individual interpretation of what constitutes threats or violence. Instead of a single item to measure threats or violence, we used an 18-item check-list questionnaire, in which violent and threatening acts are specified; Thus making the answers more objective. This difference may explain that frequencies found in this study are somewhat higher than in the NRCWE (2015) data (see 'Sector specific profiles', pp. 33-34), however, it does not negate the observation that type of sector, in contrast to occupation alone, should be included when monitoring the frequency of workplace violence and threats.

Although the scales were based on different types of acts of violence or threats, it was not possible to distinguish between different types of acts in the interpretation of results. Thus, an act of spitting is weighed similarly to an act of hitting. Sharipova and colleagues (2008) divided these types of violent behaviors into categories of assumed seriousness. However, the seriousness and the potential effects may not be consistently related to an assumed hierarchy of seriousness. For example, the degree of fear in a situation may depend more on type of perpetrator, a history of problematic relations between the perpetrator and employee, the setting (is help available?) and the capabilities of the employee than the type of violent or threatening act by itself. Therefore, the present study did not distinguish between types of acts in the analyses. However, future studies may look at the relative health consequences related to different types of acts of threats and violence, while also considering cumulative effects. This would inform a possible hierarchy of seriousness.

### **Construct validity**

Construct validity refers to the extent to which operational measures of variables match or encompass the intended theoretical construct (Cooligan, 2005). Workplace violence, as defined in this thesis, must take place in relation to work, and refers to behaviors that explicitly or implicitly imply physical harm, i.e. threats of violence and physical violence. Questionnaire items were initiated by a text specifying that behaviors must take place at the current worksite within the past 12 months, matching the theoretical construct. Each item concerning threatening acts included the word 'threat' in some variation, while all items concerning violence involved offensive physical contact. However, these items did not involve perceived intent to harm, which may be considered an important element in the theoretical construct of aggression (Baron, 1977). For several reasons, the role of intent was downplayed in the theoretical definition and

omitted from the operational definition of this thesis. One reason is that it is normally impossible to verify the presence or absence of intent (Baron, 1977; Matthiesen & Einarsen, 2010). Intentions are private, hidden events not open to direct observation, therefore they must be inferred from conditions that both precede and follow alleged acts of aggression (Baron, 1977). Relying on inferences entails substantial subjectivity owing to variability and disagreement about whether a particular act is, in fact, aggressive. Furthermore, in human service work, the professional take on clients may be expressed as “it was the illness – not the person – that did the boxing, kicking, or biting” (Åkerström, 2002). Åkerström notes that the deliberateness of patient actions was the subject of continuous interpretive work, and suspected intent was not something employees willingly admitted. These barriers and the substantial subjectivity makes it little feasible to include intent in a questionnaire survey of the present format.

### **Issues of confounding**

As a way of addressing third variables, or confounders, which may be considered 'alternate explanations' for the outcome in question, researchers frequently control for these variables. However, a considerable limitation to this approach is that by controlling for potential confounding variables, researchers may indirectly partial the variance of many other variables (Breagh, 2005; Spector, Zapf, Chen, & Frese, 2000). Particularly, with a multi-causal phenomenon as workplace violence, it is possible to control for a list of variables, and the consequences of such indirect partialling are difficult to evaluate. For the current study, we chose to control for a minimum of relevant variables. These were individual factors associated with workplace violence, such as age, gender, seniority, and also baseline exposure.

The issue of controlling for baseline exposure has been debated. Glymour and colleagues (2005) suggest that in models of change, baseline adjustment is likely to induce spurious statistical associations between predictor and outcome. However, seeing that low levels of exposure at baseline may be the result of high levels of prevention behaviors at baseline (paper II), the main interest in the follow-up study was on new incidences of workplace violence, thus arguing for the control for baseline. In paper III, we stratified the logistic analysis by high/low baseline levels of threats and violence, in order to examine possible spurious statistical associations between predictor and outcome. This did not change the overall results. However, in the case of occasional bullying we did find differences for high and low baseline exposure groups, but these

results were still not significant.

By including the control for baseline levels, this study confirmed the impact of baseline exposure. As already mentioned, the Nagelkerke estimates show that 40-50% of variance is explained by the models in study III, while this is 30-40% in study II. However, important to note is that without adjusting for baseline levels these estimates would be markedly lower. The sole effect of baseline levels of violence and threats were of such strength that the incremental value in Nagelkerke estimates were close to 20% (also in paper II; data not shown), suggesting that this risk factor may be the most important single factor to explain variance.

### **Statistical considerations**

In paper I, we used a one-way between-subjects ANOVA, however, this test assumes linearity and homoskedasticity, and although violations of these assumptions were more severe with follow-up data, these scales showed similar problems at baseline. However, a non-parametric Kruskal-Wallis test confirmed the original results. Thus, I feel confident in our original conclusions.

The use of dichotomizing measures, i.e. threats and violence, means that we lose some information and therefore we are perhaps simplifying the relationships in question. However, a study comparing the use of dichotomization with the use of continuous variables, found that dichotomization does not necessarily cause a decrease in measured strength of associations; nor do different dichotomization splits greatly affect the conclusions of the most important variables (Farrington & Loeber, 2000). Therefore, the loss of information by use of dichotomized measures in this study may also be limited.

Doing statistics with large sample sizes means that even idiosyncratic differences may become statistically significant, and you run the risk of detecting an effect that is not present (Type 1 error). Confidence intervals give more accurate information about uncertainty than p-values (Hoekstra, Johnson, & Kiers, 2012; Cumming, 2012), and thus papers II and III, use only confidence intervals to both judge significance and show strength of evidence. However, equally important is it to recognize trends in the results, such as dose-response relationships (as in paper II) and whether OR's (also insignificant ones) are in the expected direction (as in paper III). This gives further strength to the conclusions.



# CONCLUSION

## **Sector specific profiles**

The results from the present thesis show that employees in eldercare, psychiatry, special schools, and in the prison and probation services are at considerable risk of workplace violence and threats. Each of these sectors have exposure frequencies higher than for the national average, i.e. 5.8% for violence and 8.4% for threats (NRCWE, 2015), and are thus confirmed as high risk sectors. Moreover, the presented results demonstrate statistically significant differences in exposure frequencies between these sectors, which imply that sector and not occupation alone should be included when monitoring the frequency of workplace violence.

A baseline comparison on sector specific profiles showed that higher formal reporting of incidents was related to higher exposure frequencies, but there was no consistent relationship between formal reporting and self-rated seriousness of incidents nor between exposure and accepting attitudes concerning workplace violence. These latter results indicate that other structural qualities, such as type of client/perpetrator and professional identity, may exert a stronger influence on these estimates than merely the frequency of workplace violence.

## **Interpersonal behaviors that may be associated with decreased risk of self-reported exposure to workplace violence**

Significant preventive effects were found for prevention behaviors at all levels, i.e. top management, supervisor, and co-worker, and across sectors, except in special schools. The results show the same trend in preventive effect across different sectors, which strengthen the results. Moreover, a tentative trend across sectors suggest that similar

frequency levels of violence and threats are related to more similar preventive effects. Thus, supervisor and co-worker prevention behavior may be effective with a relatively moderate degree of violence or threats, while only top-management may affect relatively high levels of threats or violence and may not have any effect on relatively low levels of violence. These findings imply that the same prevention behaviors may be associated with decreased risk of workplace violence across sectors, despite structural and situational differences, although modified by the frequency of workplace violence.

### **Interpersonal behaviors that may be associated with increased risk of self-reported exposure to workplace violence**

The results supported the hypothesized escalation of aggressive behaviors by showing that conflicts and quarrels, not bullying, were significantly associated with increased risk of threats and violence. The escalating pattern was further supported in that threats partially mediated the relationship between conflicts and violence. Accumulation effects were supported in that more frequent conflicts were associated with higher odds ratios. However, emotional exhaustion was not a significant mediator of the relationship between neither bullying nor conflicts and violence or threats; thus, this measure of strain could not explain the accumulation and escalation of aggression in the current study.

Results on the victim-perpetrator relationship showed that significant escalation occurred when the involved parties were similar at both baseline and follow-up. This was the case for conflicts, but not for bullying. This finding suggests that aggression from one context (being bullied by co-workers) was not displaced toward unassociated targets (clients). The escalating pattern of aggression implies that prevention behaviors also should focus on preventing conflicts as a means of ultimately preventing threats and violence.

## **IMPLICATIONS OF THE CURRENT THESIS**

### **Implications for practice**

The findings from this thesis have two main implications for practice. First, to increase the knowledge of workplace hazards such as workplace violence. The current study has contributed to significantly more focus on the topic of workplace violence within special schools, and they have initiated more awareness on this issue. Moreover, the current results on sector profiles may encourage the use of client-related sectors, as well as occupations, in the national monitoring of workplace violence. Second, to inform prevention strategies both with respect to likely sector differences, specific relevant prevention behaviors, and the accumulating and escalating effect of aggressive encounters. This may motivate designing and adhering to violence prevention policies, while also encouraging refining de-escalating techniques to not only cover specific encounters. The latter implies identifying problematic client-employee relationships and pro-actively, before the rise of a new conflict, practice non-aggressive communication in an effort to break a vicious pattern of accumulating and escalating aggressive behavior.

### **Future research**

The findings of this thesis imply several directions for future research. Future study designs may include more time-points in order to identify the form of change over time, and also to explore the issue of length of time lags. Moreover, in order to inform whether self-report questionnaires are under- or over-reporting, future studies may compare multiple data sources, such as questionnaires, diaries, and internal reporting

systems. Another important venue for future research is investigating the preventive effects of prevention behaviors (study II) in an experimental (intervention) design. This would overcome obstacles of controlling for 'alternate explanations' and it would be possible to conclude causal relationships.

The above implications revolve around study methodology; however, topics for future studies may be the relative health consequences related to different types of acts of threats and violence, while also considering cumulative effects. This type of analyses may further be stratified for sector differences in order to identify relative sector profiles related to the consequences of workplace violence. Moreover, more qualitative knowledge on the relationship between violence prevention and workplace violence in special schools is needed. Lastly, escalated employee-client relationships may be further explored, particularly observing possible retaliatory actions and whether either party instigates or seeks out conflicts with the other party.



## **ENGLISH SUMMARY**

### **Background**

Workplace violence and threats of violence have been identified as major occupational health hazards, and exposure rates are particularly high in human service sectors. The complexity of violence prevention parallel the multiple risk factors associated with workplace violence and threats. Recognizing the interpersonal nature of aggression involves identifying interpersonal workplace behaviors that may either prevent or increase exposure rates in high-risk work sectors.

### **Aims**

One aim of this thesis was to compare high-risk works sectors on frequencies of workplace violence and threats. A second aim was to explore aspects of interpersonal behavior that may either be associated with increased risk or decreased risk of violence and threats. These behaviors included prevention behaviors among co-workers, supervisor and top-management, and also aggressive behaviors, such as bullying and conflicts.

### **Material and methods**

The study was conducted as a two-wave prospective study, in which questionnaires were distributed with a 1-year time span. Participants of this study were employees at worksites within four areas of human service work, namely psychiatry, eldercare, prison and probations services, and special schools. The sample consisted of 5.497 respondents at baseline and 3.584 respondents at follow-up. Descriptive statistics, one-way ANOVA's, correlation, and logistic longitudinal regression were used to describe and analyze associations between predictor and outcome (violence and threats).

## **Results**

Differences between non-responders and responders did not imply selection bias. Statistically significant differences were found across sectors with regard to frequencies of violence and threats, although the latter was not significantly different for eldercare and the prison and probations services. These sector profiles show that special schools have the most exposure, thereafter psychiatry, while eldercare had higher levels of violence than the prison and probations services.

Significant preventative effects were found for prevention behaviors at all levels, i.e. top management, supervisor, and co-worker, and across sectors, except in special schools. Moreover, results showed that conflicts, not bullying, at baseline were significantly related to higher rates of threats and violence at follow-up. There were no mediation effects by emotional exhaustion; however, threats were a significant partial mediator of the relationship between conflicts and violence.

## **Conclusion and perspectives**

The results of this thesis underline that sector and not occupation alone should be included when monitoring the frequency of workplace violence.

The positive results on the effects of prevention behaviors stress the importance of the enactment of prevention policies by several actors in an organizational hierarchy, including the aspect of social support. The escalating pattern of aggressive incidents, from conflicts to threats to violence, in the employee-client relationship imply that prevention behaviors also should focus on preventing conflicts as a means of ultimately preventing threats and violence.

## DANSK RESUMÉ

### **Baggrund**

Vold og trusler på arbejdet er identificeret som betydelige arbejdsmiljøproblemer, hvor risikoen er særlig høj for ansatte som arbejder med klienter, patienter, indsatte, kunder m.m. Voldsforebyggelse er kompleks, hvilket hænger sammen med de mange mulige risikofaktorer, som kan føre til vold og trusler. Erkendelsen af at aggressioner opstår i et interpersonelt samspil bevirker et fokus på mulige interaktioner som enten kan forebygge eller øge risikoen for vold og trusler på arbejdet.

### **Formål**

Et formål i denne afhandling var at sammenligne høj-risiko brancher på hyppigheder af vold og trusler, for derved at bidrage til mere viden om det relative omfang af vold og trusler samt den relative udfordring i forhold til voldsforebyggelse.

Et andet formål i denne afhandling var at udforske aspekter af interpersonel adfærd som kan være associeret med mindre eller mere risiko for vold og trusler. Mere specifikt drejer det sig om forebyggelses-adfærd i top ledelsen, nærmeste ledelse, og blandt kolleger, samt betydningen af aggressiv adfærd, såsom mobning og konflikter.

### **Materiale og metoder**

Studiedesignet er en prospektiv spørgeskema-undersøgelse, der omfatter to målinger med 1 års interval. Deltagere var ansatte i psykiatrien, ældreområdet, specialskoler, og kriminalforsorgen. Studiepopulationen omfattede 5.497 respondenter ved baseline og 3.584 ved opfølgning. Deskriptiv statistik, ANOVA'er, korrelation, og logistisk longitudinel regression blev anvendt til at beskrive og analysere sammenhængen mellem prædiktor og udfald (vold og trusler).

## **Resultater**

Forskelle mellem non-respondenter og respondenter viste ikke tegn på selektions bias. Frekvensen af vold og trusler var statistisk signifikant forskellig på tværs af brancher, dog var ældreområdet og kriminalforsorgen ikke forskellige med hensyn til frekvensen af trusler. Dermed viste sig et mønster, hvor specialskoler var mest udsatte, dernæst psykiatrien, imedens ældreområdet havde højere frekvens af vold end kriminalforsorgen.

Forebyggelses-adfærd i top ledelsen, nærmeste ledelse, og blandt kolleger viste signifikante sammenhænge med lavere risiko for vold eller/og trusler, på tværs af brancher, dog undtaget specialskoler. Dertil viste resultater at konflikter, ikke mobning, havde signifikant sammenhæng med højere risiko for trusler og vold. Der var dog ingen mediations effekt af følelsesmæssig udmattelse; derimod var trusler en signifikant delvis mediator i forholdet mellem konflikter og vold.

## **Konklusion og perspektiver**

Resultaterne fra denne afhandling understreger at branche, og ikke udelukkende job kategori, skal inddrages, når man undersøger hyppigheder af vold og trusler.

De positive fund på effekten af forebyggelses-adfærd understreger betydningen af at levendegøre voldspolitikken i interaktioner på tværs af organisationens hierarki, herunder at inkludere social støtte. Det eskalerende mønster fra konflikter til trusler til vold i forholdet mellem ansat og klient antyder at forebyggelses-adfærd også bør fokusere på konflikter, for derved at bremse et mønster af eskalerende aggression.

## REFERENCE LIST

- Åkerström, M. (1993). Våld och hot i sjukvårdsarbeten (Violence and Threats in Medical Settings). Lund: Network for Research in Criminology and Deviant Behavior at Lund University.
- Åkerström, M. (2002). Slaps, punches, pinches - but not violence: Boundary-work in nursing homes for the elderly. *Symbolic interaction*, 25, 515-536.
- Andersen, L. P., Hogh, A., Biering, K., & Gadegaard, C. A. (2015). Work-related threats and violence in human service sectors: The importance of the psychosocial work environment examined in a prospective study. *Work in progress*.
- Andersen, L. P. & Mikkelsen, K. L. (2008). Recall of occupational injuries: A comparison of questionnaire and diary data. *Safety Science*, 46, 255-260.
- Andersson, L. M. & Pearson, C. M. (1999). Tit for tat? The spiraling effect of incivility in the workplace. *Academy of Management Review*, 24, 452-471.
- Aquino, K. & Thau, S. (2009). Workplace victimization: Aggression from the target's perspective. *Annual Review of Psychology*, 60, 717-741.
- Arnetz, J. E. & Arnetz, B. B. (2000). Implementation and evaluation of a practical intervention programme for dealing with violence towards health care workers. *Journal of Advanced Nursing*, 31, 668-80.
- Arnetz, J. E., Arnetz, B. B., & Petterson, I. L. (1996). Violence in the nursing profession: occupational and lifestyle risk factors in Swedish nurses. *Work and stress*, 10, 119-127.
- Barling, J., Dupré, K. E., & Kelloway, E. K. (2009). Predicting workplace aggression and violence. *Annual Review of Psychology*, 60, 671-692.
- Baron, M. R. & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Baron, R. A. (1977). *Human Aggression*. New York: Plenum Press.
- Beale, D., Cox, T., & Leather, P. (1996). Work-related violence - is national reporting good enough? *Work and stress*, 10, 99-103.

- Bensley, L., Nelson, N., Kaufman, J., Silverstein, B., & Shields, J. W. (1995). Patient and staff views of factors influencing assaults on psychiatric hospital employees. *Issues in mental health nursing*, 16, 433-446.
- Berkowitz, L. (1965). The concept of aggressive drive: Some additional considerations. In L. Berkowitz (Ed.), *Advances in experimental psychology* (pp. 301-329). New York: Academic Press.
- Berkowitz, L. (1969). The frustration-aggression hypothesis revisited. In L. Berkowitz (Ed.), *Roots of aggression* (pp. 1-28). New York: Atherton Press.
- Berkowitz, L. (1983). The experience of anger as a parallel process in the display of impulsive, "angry" aggression. In R. G. Geen & E. I. Donnerstein (Eds.), *Aggression: Theoretical and empirical reviews* (pp. 103-133).
- Berkowitz, L. (1989). The frustration-aggression hypothesis: An examination and reformulation. *Psychological Bulletin*, 59-73.
- Bowling, N. A. & Beehr, T. A. (2006). Workplace Harassment From the Victim's Perspective: A Theoretical Model and Meta-Analysis. *Journal of Applied Psychology*, 91, 998-1012.
- Breagh, J. A. (2005). Rethinking the control of nuisance variables in theory testing. *Journal of Business and Psychology*, 20, 429-443.
- Brooks, B., Staniford, A., Dollard, M., & Wiseman, R. J. (2010). Risk factors, consequences, and management of aggression in healthcare environments. In J. Houdmont & L. Stavroula (Eds.), *Contemporary occupational health psychology. Global perspectives on research and practice* (pp. 329-353). Chichester: Wiley-Blackwell, John Wiley & Sons Ltd.
- Caldwell, M. F. (1992). Incidence of PTSD among staff victims of patient violence. *Hospital & Community Psychiatry*, 43, 838-839.
- Cameron, A., Palm, K., & Follette, V. (2010). Reaction to stressful life events: What predicts symptom severity? *Journal of Anxiety Disorders*, 645-649.
- Carmel, H. & Hunter, M. (1989). Staff Injuries from Inpatient Violence. *Hospital & Community Psychiatry*, 40, 41-46.
- Chang, C., Eatough, E. M., Spector, P. E., & Kessler, S. R. (2012). Violence-prevention climate, exposure to violence and aggression, and prevention behavior: A mediation model. *Journal of Organizational Behavior*, 33, 657-677.
- Chapman, R., Styles, I., Perry, L., & Combs, S. (2010). Nurses' experience of adjusting to workplace violence: A theory of adaptation. *International Journal of Mental Health Nursing*, 19, 186-194.
- Clausen, T., Hogh, A., & Borg, V. (2012). Acts of offensive behaviour and risk of long-term sickness absence in the Danish elder-care services: a prospective analysis of register-based outcomes. *International archives of occupational and environmental health*, 85, 85:381-387.

Clausen, T., Hogh, A., Carneiro, I. G., & Borg, V. (2013). Does psychological well-being mediate the association between experiences of acts of offensive behaviour and turnover among care workers? A longitudinal analysis. *Journal of Advanced Nursing*, 69, 1301-1313.

Cole, L. L., Grubb, P. L., Sauter, S. L., Swanson, N. G., & Lawless, P. (1997). Psychosocial correlates of harassment, threats and fear of violence in the workplace. *Scandinavian Journal of Environmental Health*, 23, 450-457.

Cooligan, H. (2005). *Research Methods and Statistics in Psychology*. (3 ed.) London: Hodder & Stoughton Educational.

Cooper, M. D. & Phillips, R. A. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal of Safety Research*, 35, 497-512.

Cumming, G. (2012). *Understanding the new statistics: Effect size, confidence intervals and meta-analysis*. New York: Routledge.

De Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2004). The relationships between work characteristics and mental health: Examining normal, reversed and reciprocal relationships in a 4-wave study. *Work & Stress*, 18, 149-166.

Dollard, J., Doob, N., Miller, N. E., Mowrer, O. H., & Sears, R. R. (1939). *Frustration and Aggression*. New Haven: Yale University Press.

Dupré, K. E. & Barling, J. (2006). Predicting and Preventing Supervisory Workplace aggression. *Journal of Occupational Health Psychology*, 11, 13-26.

Euwema, M. C., Kop, N., & Bakker, A. B. (2004). The behaviour of police officers in conflict situations: how burnout and reduced dominance contribute to better outcomes. *Work and stress*, 18, 23-38.

Farrington, D. P. & Loeber, R. (2000). Some benefits of dichotomization in psychiatric and criminological research. *Criminal Behavior and Mental Health*, 100-122.

Fauteux, K. (2010). De-Escalating Angry and Violent Clients. *American Journal of Psychotherapy*, 64, 195-213.

Felson, R. B. (1992). "Kick'em when they're down": Explanations of the Relationship Between Stress and Interpersonal Aggression and Violence. *The Sociological Quarterly*, 33, 1-16.

Felson, R. B. (1992). "Kick'em when they're down": Explanations of the Relationship Between Stress and Interpersonal Aggression and Violence. *The Sociological Quarterly*, 33, 1-16.

Felson, R. B. (1999). A Social Psychological Approach to Interpersonal Aggression. In V.B. Van Hasselt & M. Hersen (Eds.), *Aggression and Violence*. An Introductory text (pp. 9-22).

- Felson, R. B. & Steadman, H. J. (1983). Situational Factors in Disputes Leading to Criminal Violence. *Criminology*, 21, 59-74.
- Felson, R. B. & Tedeschi, J. T. (1993). *Social interactionist perspectives on aggression and violence: An introduction*. Washington, DC, US: American Psychological Association.
- Felson, R. B. & Steadman, H. J. (1983). Situational factors in disputes leading to criminal violence. *Criminology: An Interdisciplinary Journal*, 21, 59-74.
- Fernandes, C. M., Raboud, J. M., Christenson, J. M., Bouthillette, F., Bullock, L., Ouellet, L. et al. (2002). The effect of an education program on violence in the emergency department. *Annals of Emergency Medicine*, 47-55.
- Fox, S. & Spector, P. E. (1999). A model of work frustration-aggression. *Journal of Organizational Behavior*, 915-931.
- Frese, M. (1999). Social support as a moderator of the relationship between work stressors and psychological dysfunctioning: A longitudinal study with objective measures. *Journal of Occupational Health Psychology*, 4, 179-192.
- Gerberich, S. G., Nachreiner, N. M., Ryan, A. D., Church, T. R., McGovern, P. M., Geisser, M. S. et al. (2011). Violence against educators: A population-based study. *Journal of occupational and environmental medicine*, 53, 294-302.
- Gifford, M. L. & Anderson, J. E. (2010). Barriers and motivating factors in reporting incidents of assault in mental health care. *Journal of the American psychiatric nurses association*, 16, 288-298.
- Gimeno, D., Barrientos-Gutierrez, T., Burau, K. D., & Felknor, S. A. (2012). Safety climate and verbal abuse among public hospital-based workers in Costa Rica. *Work: Journal of Prevention, Assessment & Rehabilitation*, 42, 29-38.
- Gimeno, D., Felknor, S. A., Burau, K. D., Delclos, G. L., & Barrientos-Gutierrez, T. (2007). Association of occupation and safety practices with work-injury absence among public hospital employees in Latin America: a study from Costa Rica. *Injury Prevention*, 13, 264-269.
- Glomb, T. M. (2002). Workplace Anger and Aggression: Informing Conceptual Models with data from specific encounters. *Journal of Occupational Health Psychology*, 7, 20-36.
- Glomb, T. M. (2010). Predicting workplace aggression: reciprocal aggression, organizational, and individual antecedents. *International Journal of Organization Theory and Behavior*, 13, 249-291.
- Gold, S., Marx, B., Soler-Baillo, J., & Sloan, D. (2005). Is life stress more traumatic than traumatic stress? *Journal of Anxiety Disorders*, 687-698.
- Hill, A. B. (1965). The environment and disease: Association or causation? *Proceedings of the Royal Society of Medicine*, 295-300.



- Hodgson, M. J., Reed, R., Craig, T., Murphy, F., Lehmann, L., Belton, L. et al. (2004). Violence in Healthcare Facilities: Lessons From the Veterans Health Administration. *Journal of occupational and environmental medicine*, 46, 1158-1165.
- Hoekstra, R., Johnson, A., & Kiers, H. A. (2012). Confidence Intervals Make a Difference: Effects of Showing Confidence Intervals on Inferential Reasoning. *Educational and Psychological Measurement*, 72, 1039-1052.
- Hogh, A., Borg, V., & Mikkelsen, K. L. (2003). Work-related violence as a predictor of fatigue: a 5-year follow-up of the Danish work environment cohort study. *Work and stress*, 17, 182-194.
- Hogh, A. & Viitasara, E. (2005). A systematic review of longitudinal studies of nonfatal workplace violence. *European journal of work and organizational psychology*, 14, 291-313.
- Hussein, R. T. (1989). Informal groups, leadership and productivity. *Leadership & Organization Development Journal*, 10, 9-16.
- Johnson, S. E. (2007). The predictive validity of safety climate. *Journal of Safety Research*, 38, 511-521.
- Kessler, S. R., Spector, P. E., Chang, C., & Parr, A. D. (2008). Organizational violence and aggression: development of the three-factor violence climate survey. *Work and stress*, 22, 108-124.
- Konda, S., Reichard, A. A., & Tiesman, H. M. (2012). Occupational injuries among U.S. correctional officers, 1999-2008. *Journal of Safety Research*, 43, 181-186.
- Konda, S., Tiesman, H., Reichard, A., & Hartley, D. (2013). U.S. Correctional Officers Killed or Injured on the Job. *Corrections Today*, 75, 122-125.
- Kristensen, T. S. (2008). *Vejledning i brugen af Tre-dækker spørgeskemaet. Det mellem-lange spørgeskema*. MuninTech ApS.
- Lanza, M., Zeiss, R., & Rierdan, J. (2006). Non-Physical Violence. A Risk Factor for Physical Violence in Health Care Settings. *American Association of Occupational Health Nursing Journal*, 397-402.
- Lanza, M. L. (1988). Factors relevant to patient assault. *Issues in mental health nursing*, 9, 239-257.
- Lanza, M. L. & Kayne, H. L. (1995). Patient assault: A comparison of patient and staff perceptions. *Issues in mental health nursing*, 16, 129-141.
- Lawoko, S., Soares, J. J. F., & Nolan, P. (2004). Violence towards psychiatric staff: a comparison of gender, job and environmental characteristics in England and Sweden. *Work and stress*, 18, 39-55.
- Leather, P., Lawrence, C., Beale, D., & Dickson, R. (1998). Exposure to occupational violence and the buffering effects of intra-organizational support. *Work and stress*, 12, 161-178.

- Leather, P. & Zarola, T. (2010). *Violence at work*. Wiley-Blackwell.
- Lee, S. S., Gerberich, S. G., Waller, L. A., Anderson, A., & McGovern, P. (1999). Work-related assault injuries among nurses. *Epidemiology*, 685-691.
- Lipscomb, J. A., London, M., Chen, Y. M., Flannery, K., Watt, M., Geiger-Brown, J. et al. (2012). Safety climate and workplace violence prevention in state-run residential addiction treatment centers. *Work*, 47-56.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397-422.
- Matthiesen, S. B. & Einarsen, S. (2010). Bullying in the workplace: definition, prevalence, antecedents and consequences. *International Journal of Organization Theory and Behavior*, 13, 202-248.
- Menckel, E. & Viitasara, E. (2002). Threats and violence in Swedish care and welfare - magnitude of the problem and impact on municipal personnel. *Scandinavian journal of caring science*, 16, 376-385.
- Merchant, J. A. & Lundell, J. A. (2001). Workplace Violence Intervention Research Workshop, April 5-7, 2000, Washington, DC. Background, rationale, and summary. *American Journal of Preventive Medicine*, 20, 2, 135-140.
- Miller, N. E. (1984). Theory and experiment relating psychoanalytic displacement to stimulus-response generalization. *Journal of Abnormal and Social Psychology*, 155-178.
- Murphy, C. M. & O'Leary, K. D. (1989). Psychological aggression predicts physical aggression in early marriage. *Journal of Consulting and Clinical Psychology*, 57, 579-582.
- Nachreiner, N. M., Gerberich, S. G., McGovern, P. M., Church, T. R., Hansen, H. E., Geisser, M. S. et al. (2005). Relation between policies and work related assault: Minnesota nurses' study. *Occupational and Environmental Medicine*, 675-681.
- Naveh, E., Katz-Navon, T., & Stern, Z. (2005). Treatment Errors in Healthcare: A Safety Climate Approach. *Management Science*, 51, 948-960.
- Nielsen, M. B. & Einarsen, S. (2008). Sampling in research on interpersonal aggression. *Aggressive Behavior*, 34, 265-272.
- NRCWE. (2006). Lønmodtager undersøgelsen 2004-2005. The (Danish) National Research Centre for the Working Environment. <http://olddata.arbejdsmiljoforskning.dk/Nationale%20Data/3DII.aspx?lang=da>.
- NRCWE. (2015). Arbejdsmiljøet i tal. 2012-2014. The (Danish) National Research Centre for the Working Environment. <http://www.arbejdsmiljoforskning.dk/da/arbejdsmiljoe-data/arbejdsmiljoe-og-helbred-20/arbejdsmiljoet-i-tal>.
- Pejtersen, J. H., Kristensen, T. S., Borg, V., & Bolyard, R. (2010). The second version of the Copenhagen Psychosocial Questionnaire. *Scandinavian journal of public health*, 38, 8-24.

- Piquero, N. L., Piquero, A. R., Craig, J. M., & Clipper, S. J. (2013). Assessing research on workplace violence, 2000-2012. *Aggression and Violent Behavior, 383-394*.
- Roche, M., Diers, D., Duffield, C., & Catling-Paull, C. (2010). Violence Toward Nurses, the Work Environment, and Patient Outcomes. *Journal of Nursing Scholarship, 42, 13-22*.
- Rogosa, D. R. (1995). Myths and Methods: "Myths about longitudinal research" plus supplemental questions. In J.M.Gottman (Ed.), *The analysis of change* (pp. 3-66). Mahwah, NJ: Lawrence Erlbaum.
- Rothman, K. & Greenland, S. (1998). *Modern Epidemiology*. (2 ed.) Lippincott-Raven.
- Safran, D. A. & Tartaglino, A. J. (1998). Workplace violence in an urban jail setting. In G.R.Vandenbos & E. Q. Bulatao (Eds.), *Violence on the job. Identifying risks and developing solutions* (pp. 207-216). Washington,DC: American psychological association.
- Salminen, S. (1997). Violence in the Workplaces in Finland. *Journal of Safety Research, 28, 123-131*.
- Schat, A. C. & Kelloway, E. K. (2003). Reducing the adverse consequences of workplace aggression and violence: the buffering effects of organizational support. *Journal of Occupational Health Psychology, 8, 110-122*.
- Schat, A. C. H. & Kelloway, E. K. (2005). Workplace Aggression. In J.Barling, E. K. Kelloway, & M. Frone (Eds.), *Handbook of Work Stress* (pp. 189-218). Thousand Oaks, CA: Sage.
- Schein, E. H. (2010). *Organizational Culture and Leadership*. (4th ed.) Jossey-Bass.
- Sharipova, M., Borg, V., & Hogh, A. (2008). Prevalence,seriousness and reporting of work-related violence in the Danish elderly care. *Scandinavian journal of caring science, 22, 574-581*.
- Sharipova, M., Hogh, A., & Borg, V. (2010). Individual and organizational risk factors of work-related violence in the Danish elder care. *Scandinavian journal of caring science, 24, 332-340*.
- Silva, S., Lima, M. L., & Baptista, C. (2004). OSCI: An organisational and safety climate inventory. *Safety Science, 42, 205-220*.
- Singer, J. D. & Willett, J. B. (2003). *Applied longitudinal data analysis*. New York: Oxford University Press.
- Snyder, L. A., Chen, P. Y., & Vacha-Haase, T. (2007). The underreporting gap in aggressive incidents from geriatric patients against certified nursing assistants. *Violence and victims, 22, 367-379*.
- Soares, J. J. F., Lawoko, S., & Nolan, P. (2000). The nature, extent and determinants of violence against psychiatric personnel. *Work and stress, 14, 105-120*.

- Spector, P. E., Coulter, M. L., Stockwell, H. G., & Matz, M. W. (2007). Perceived violence climate: A new construct and its relationship to workplace physical violence and verbal aggression, and their potential consequences. *Work and stress*, 21, 117-130.
- Spector, P. E., Zapf, D., Chen, P. Y., & Frese, M. (2000). Why negative affectivity should not be controlled in job stress research: don't throw the baby out with the bath water. *Journal of Organizational Behavior*, 79-95.
- Spector, P. E., Zhou, Z. E., & Che, X. X. (2014). Nurse exposure to physical and nonphysical violence, bullying, and sexual harassment: A quantitative review. *International Journal of Nursing Studies*, 51, 72-84.
- Tang, K. (2014). A reciprocal interplay between psychosocial job stressors and worker wellbeing? A systematic review of the "reversed" effect. *Scandinavian Journal of Work, Environment & Health*, 40, 441.
- Thor, H. (2005). Spørgeskemaer i klinisk forskning. Fokus på oversættelse, tilpasning og afprøvning af fremmedsprogede spørgeskemaer. <http://fysio.dk/fafo/Forskning/Metode-artikler/Oversattelse-af-sporgeskemaer/>.
- Tiesman, H., Konda, S., Hendricks, S., Mercer, D., & Amandus, H. (2013). Workplace violence among Pennsylvania education workers: Differences among occupations. *Journal of Safety Research*, 65-71.
- van Gelder, M. M. H. J., Bretveld, R. W., & Roeleveld, N. (2010). Web-based questionnaires: the future in epidemiology? *American journal of epidemiology*, 172, 1292-1298.
- Vegchel, N. V., Jonge, J. D., Söderfeldt, M., Dormann, C., & Schaufeli, W. (2004). Quantitative Versus Emotional Demands Among Swedish Human Service Employees: Moderating Effects of Job Control and Social Support. *International Journal of Stress Management*, 11, 21-40.
- Viitasara, E. & Menckel, E. (2002). Developing a framework for identifying individual and organizational risk factors for the prevention of violence in the health-care sector. *Work*, 19, 117-123.
- Viitasara, E., Sverke, M., & Menckel, E. (2003). Multiple risk factors for violence to seven occupational groups in the Swedish caring sector. *Relations Industrielles*, 58, 202-231.
- Wassel, J. T. (2009). Workplace violence intervention effectiveness: A systematic literature review. *Safety Science*, 1049-1055.
- Whittington, R. & Wykes, T. (1989). Invisible injury. *Nursing Times*, 85, 30-32.
- Wilkinson, C. L. (1999). An evaluation of an educational program on the management of assaultive behaviors. *Journal of Gerontological Nursing*, 6-11.
- Winstanley, S. & Whittington, R. (2002). Anxiety, burnout and coping styles in general hospital staff exposed to workplace aggression: A cyclical model of burnout and vulnerability to aggression. *Work & Stress*, 16, 302-315.

www.arbejdsmiljoviden.dk. (2013). Nul tolerance oeger voldsstatistik. <http://www.arbejdsmiljoviden.dk/Aktuelt/Nyheder/2013/05/17-Nul-tolerance-oeger-voldsstatistik> .

Wynne, R., Clarkin, N., Cox, T., & Griffiths, A. (1997). *Guidance on the prevention of violence at work*. Luxembourg: European Commission, DG-V.

Yang, L. Q., Spector, P. E., Chang, C. H., Gallant-Roman, M., & Powell, J. (2012). Psychosocial precursors and physical consequences of workplace violence towards nurses: A longitudinal examination with naturally occurring groups in hospital settings. *International Journal of Nursing Studies*, 49, 1091-1102.

Zapf, D., Dormann, C., & Frese, M. (1996). Longitudinal studies in organizational stress research: A review of the literature with reference to methodological issues. *Journal of Occupational Health Psychology*, 1, 145-169.

Zapf, D. & Gross, C. (2001). Conflict escalation and coping with workplace bullying: A replication and extension. *European journal of work and organizational psychology*, 10, 497-522.

Zohar, D. & Luria, G. (2003). The use of supervisory practices as leverage to improve safety behavior: A cross-level intervention model. *Journal of Safety Research*, 34, 567-577.

Zohar, D. & Luria, G. (2004). Climate as a Social-Cognitive Construction of Supervisory Safety Practices: Scripts as Proxy of Behavior Patterns. *Journal of Applied Psychology*, 89, 322-333.

Zohar, D. & Luria, G. (2005). A multilevel Model of Safety Climate: Cross-Level Relationships Between Organization and Group-level Climates. *Journal of Applied Psychology*, 90, 616-628.



# **PAPER I**

## **Threats and Physical Violence in the Workplace: A Comparative Study of Four Areas of Human Service Work**

**PUBLISHED IN JOURNAL OF INTERPERSONAL VIOLENCE**

**2013**

**28(13) 2749–2769**

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Article

# Threats and Physical Violence in the Workplace: A Comparative Study of Four Areas of Human Service Work

Journal of Interpersonal Violence  
28(13) 2749–2769  
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sagepub.com/journalsPermissions.nav  
DOI: 10.1177/0886260513487987  
jiv.sagepub.com



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## Abstract

The aim of this study was to investigate threats and physical violence in the workplace by comparing four areas of human service work, namely psychiatry, eldercare, the Prison and Probation Service (PPS), and special schools (SS). The results revealed that there were statistically significant differences in the frequency of threats and violence among these areas of human service work. In particular, employees in SS were frequently exposed. More exposure was related to a higher degree of reporting incidents in writing to the workplace. However, exposure was not consistently related to self-rated seriousness of the incidents or attitudes that reflect accept of workplace threats and violence. Both threats and physical violence were rated within a moderate range of seriousness in all these areas of work. PPS and SS expressed more accept (attitude) of workplace threats and violence in comparison to psychiatry and eldercare. Conclusion: workplace threats and violence toward staff in areas of human service work is a widespread phenomenon. There is a particular need for better prevention in SS, more

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research on the seriousness of threats in general, and more knowledge about the relationship between work environment and attitudes about workplace threats and violence.

**Keywords**

threats, physical violence, human service work, self-rated seriousness, attitudes of violence

Threats and physical violence in the workplace has been recognized as a particularly prevalent problem in the human services sector. The higher percentages of workplace violence can be attributed to the working environment, where workplaces have much higher percentages of working directly with the public and working with unstable or violent persons (U.S. Department of Labor, U.S. Bureau of Labor Statistics, 2005). Therefore, this study on workplace violence and threats has chosen to further examine areas of human service work.

The purpose of this article is to compare and explore estimates of workplace violence and threats between high-risk areas. Within the literature on workplace violence three areas are regarded as particularly affected, namely psychiatry, eldercare, and the Prison and Probation Service (PPS; Høgh & Viitasara, 2005). However, in the course of a literature search on workplace violence, it became clear that there were no studies specifically concerned with workplace violence or threats among special education staff; despite evidence that suggests that special education educators are at an increased risk in comparison to classroom educators (Gerberich et al., 2011). We included special schools (SS) in order to examine the prevalence in comparison to areas traditionally regarded as high-risk within the human service sector.

Previous studies show that the prevalence of threats and violence varies considerably (Schat & Kelloway, 2005). For instance, evening workers in the Danish eldercare were subjected to 43.1% and 35.1% threats and violence respectively (Nabe-Nielsen, Tüchsen, Christensen, Garde, & Diderichsen, 2009), in comparison to nurses/nursing personnel in U.S. care institutions, who had a prevalence of 19.4% and 19.9% for physical and psychological violence respectively (Campbell et al., 2011). In a Canadian study of teachers, 80% indicated that they had experienced some type of violence in their career, with covert violence being the most frequently reported type of violence (75.2%; Wilson, Douglas, & Lyon, 2011). Some studies have highlighted particular subgroups of employees that are particularly at risk, such as

special education teachers, who are almost five times more at risk than classroom educators (Gerberich et al., 2011), or nurses in psychiatry, who are almost twice as much at risk of any workplace violence than nurses in pediatrics (Campbell et al., 2011). Despite violence once being seen as exclusively a problem for occupations like prison officers, there are no recent studies on the prevalence among employees in prisons. A study from 1998 reported that 26% of prison officers in an American urban jail were subjected to violence, and 20% reported being exposed to more than two incidents (Safran & Tartaglino, 1998).

Trying to compare estimates of work-related violence in areas of human service work is complicated, because studies use different definitions of workplace violence, use different methods and collect data at different time points. One definition of workplace violence includes consequences of the violent incident, such as sick leave or bruising (Carmel & Hunter, 1993; Klein et al., 1997). A second way of defining workplace violence is by asking respondents to assess a range of violent and/or threatening behavior (Leather, Lawrence, Beale, & Dickson, 1998; Sharipova, Borg, & Hogh, 2008). Also, studies use different time periods for assessing violence/threats, that is, previous year or entire career (Menckel & Viitasara, 2002; Wilson et al., 2011). Several studies do not distinguish between threats and physical violence, but combine them into one question (Hogh, Sharipova, & Borg, 2008; Lawoko, Soares, & Nolan, 2004; Menckel & Viitasara, 2002). Furthermore, studies differ in their objectives, which entails that fatal, non-fatal, physical, or verbal (threats) violence may or may not be included in the definition of workplace violence.

The fact that studies are difficult to compare is a problem, because it is not possible to determine if estimates such as frequencies, perpetrators, degree of reporting, self-rated seriousness or attitudes about workplace violence are more or less similar in areas of human service work. Most studies have adopted an approach, where one occupation or one risk sector, that is, the health care sector, is examined. This approach may be preferred since being subject to violence at work involves a complex set of antecedents (Hogh & Viitasara, 2005). However, this makes it difficult to compare different areas of work or sectors.

Reporting systems are an integral part of violence prevention policies; also, reporting is a formal requirement in the case of absence from work due to incidents of workplace violence (The Danish Work Environment Authority). The issue of reporting incidents of threats and/or physical violence is relevant when comparing different areas of human service work, because some researchers have found that more frequent exposure to violence was related to more reporting (Sharipova et al., 2008). Sharipova et al. (2008) investigated whether type of perpetrator was related to

reporting, and found that reporting was more frequent when the violence was performed by someone other than clients. Furthermore, they found that reporting was dependent on the degree of self-rated seriousness of the incident, which in turn may be related to the type of client, that is, a psychiatric patient, an elderly client, an inmate, or a pupil with a behavioral problem. The study, however, only included employees in eldercare and a measure of physical violence, thus the association between the frequency of physical violence and of threats, reporting, self-rated seriousness, and type of perpetrator in different areas of human service work still needs to be addressed.

Very few studies have investigated beliefs or attitudes about threats and violence in the workplace—and these studies only include health care staff (Åkerström, 2002; Bilgin & Buzlu, 2006; Poster, 1996). Poster (1996), as well as Bilgin and Buzlu (2006), found that a great majority of the staff expect to be assaulted at some time in their careers. In addition, Poster (1996) found that nurses exposed more than three times were more likely to agree that assaults were to be expected. These beliefs coexisted with a significant underreporting, in which half of the nurses did not report the incidents (Bilgin & Buzlu, 2006). One possible explanation for this underreporting could be that patient's aggressive actions are often downplayed or accepted with reference to the patient's illness. In fact, Åkerström (2002) suggests that workers in the caring occupation avoid framing incidents as "violence" in order to keep and continue to work with patients. In contrast, Åkerström writes: "No one expects service providers in prisons to like or respect prisoners, but one does expect staff in mental hospitals to understand their patients . . ." (Åkerström, 2002, p. 533). This raises the question whether these occupations are, in fact, different concerning their attitudes about workplace violence, which in turn, may influence the degree of reporting and self-rated seriousness. In particular, attitudes that reflect a form of accept of workplace violence could imply lower self-rated seriousness and lower reporting of incidents.

Our study intends to compare the four areas of human service work on the following estimates: frequency of threats and of physical violence, perpetrators, degree of reporting incidents, self-rated seriousness of the incidents, and attitudes about workplace violence. This comparison is possible because data is collected within the same methodology, use of the same definitions of threats and physical violence, and in the same time period.

## **Method**

### *Research Design and Participants*

This article presents descriptive findings comparing four areas of human service work. The study is the first part of a large prospective

1-year follow-up survey, in which participants were given a questionnaire at baseline, which will be followed by a shorter version of the same questionnaire 12 months later.

Criteria for inclusion in the project were *employees at worksites within the four areas of human service work, namely psychiatry, eldercare, PPS, and SS* (schools for pupils, from 5 to 18 years of age, who are affected by autism, attention deficit/hyperactivity disorder (ADHD) or general learning disabilities (mentally retarded). Each *worksite should have a minimum of 18 employees*. Furthermore, employees without client contact, who had been absent from the worksite more than 3 weeks prior to receiving the questionnaire, or had been employed less than 3 weeks at the worksite were excluded from the study.

In order to recruit participants we had meetings with the top managerial level, which is in the municipal for the eldercare and counties for psychiatry; eight out of 11 municipalities decided to participate, and two of the three counties accepted to participate. Hereafter local leaders were assembled and invited to participate. Four psychiatric worksites did not meet the inclusion criteria, but all other worksites were included. SS are organized somewhat differently, therefore, each school was directly approached. Fourteen agreed to participate in the study, two declined. With regard to the PPS all the staff was included in the project.

### **Data Collection—Baseline Survey**

A web-based questionnaire was used for participants in the PPS; participants from the other areas of work received and filled out paper-and-pencil questionnaires during a planned meeting at the worksite. A researcher attended these meetings and completed questionnaires were returned to the researcher at the end of the meeting. Employees who did not participate in the meeting were asked to fill out and send the questionnaire directly to the researchers. It was stated in the cover letter of the questionnaire that participation in the study was voluntary and that the data would be treated confidentially. All questionnaires were collected in the period between May 2010 and October 2010. The study was carried out according to the Helsinki declaration of ethics.

### **Study Sample**

The response rate was 86% ( $n = 930$ ; 35 worksites) for the psychiatry, 82% ( $n = 966$ ; 29 worksites) for the eldercare, 62% ( $n = 2,843$ ; 83 worksites) for the PPS, and 90% ( $n = 758$ ; 14 worksites) for SS. A total of 161 work sites

**Table 1.** Description of Study Sample (%).

	Eldercare	Psychiatry	SS	PPS
<b>Total sample</b>	N: 966	N: 930	N: 758	N: 2843
<b>Gender: women</b>	96.7	80.8	71.6	46.2
<b>Age</b>	(N = 941)	(N = 916)	(N = 757)	(N = 2842)
<30	9.1	9.7	12.0	8.9
30-39	17.4	26.1	34.3	32.8
40-49	29.3	28.5	30.1	31.9
50-59	36.6	28.5	20.5	21.1
>60	7.5	7.2	3.0	5.2

Note: SS = Special schools. PPS = Prison and Probation Service.

and 5,497 respondents. Data on gender and age was retrieved from the survey (Table 1).

It is clear that staff in eldercare, psychiatry, and SS is predominantly female. The percentages are comparable to U.S. statistics that show that 88.2 % in nursing, psychiatric, and home health aides are women, and that 85.1 % of special education teachers are women (U.S. Department of Labor, U.S. Bureau of Labor Statistics, 2011). However, the PPS have almost equal numbers of men and women, which is unlike U.S. statistics, where only 26.1% of bailiffs, correctional officers, and jailers are women.(U.S. Department of Labor, U.S. Bureau of Labor Statistics, 2011) Some of this difference can be attributed to the fact that 18.1% of the employees in the PPS work as health personnel, teachers, social workers, and other job functions. However, it does seem that there is a gender difference, which could be due to cross-cultural differences in the protective service occupations.

## Measures

The questionnaire includes one section that inquires about threats and another section that deals with physical violence. Each section was introduced by the question "Have you been exposed to threats (physical violence) at your current workplace within the past 12 months" followed by a list of threatening and violent behavior respectively. Threatening behaviors included: threats of beatings, written threats, threats in a scolding manner, threats in an insulting manner, threats over the phone, threats involving objects, and indirect threats (toward family). Types of physically violent behaviors were: spitting, hitting, hitting with object, scratching/pinching, shoving, being held, punching with a fist, kicking, biting, having a hard object thrown at you, and use of a weapon

or weapon-like object (Menckel & Viitasara, 2002). A 5-point response-scale was given for each question: “No”, “Yes, now and then”, “Yes, monthly”, “Yes, weekly”, and “Yes, daily”. In the analyses, “now and then” and “monthly” were categorized as *occasional*, while “weekly” and “daily” were categorized as *frequent*. In order to test for significant differences we collapsed the items into a threat scale and a physical violence scale, where a high number indicate a high frequency. Both scales had high Cronbach’s  $\alpha$  of 0.79 and 0.88, indicating a high internal consistency of the scales. These scales were also used to examine the correlation of exposure and attitudes.

The exposed participants were asked who the perpetrator(s) were: “A client”, “A relative to the client”, “A coworker”, “A superior”, “A subordinate”, and “Other people”. This item was made to fit the specific area of work by exchanging “client” with either “pupil”, “patient”, “elderly citizen”, or “inmate”. It was possible to report several perpetrators.

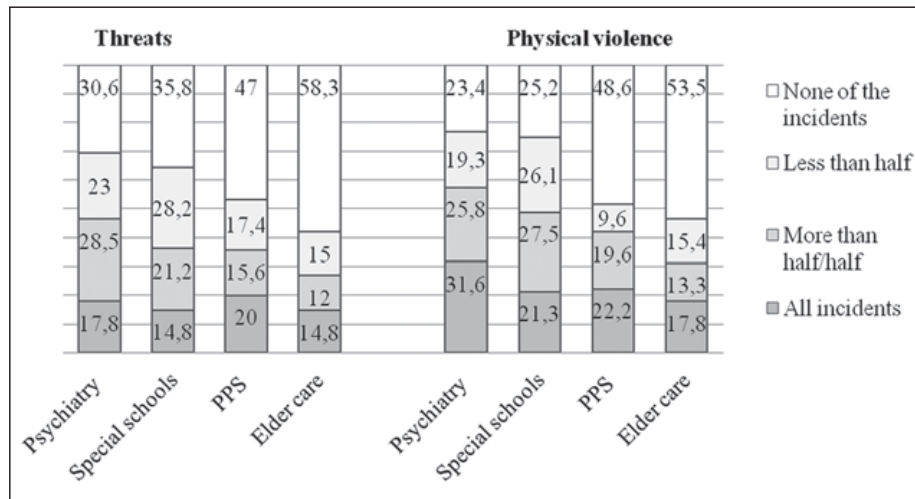
The questionnaire included two items on reporting incidents, “Have these threatening (or violent) incidents been reported in writing at the workplace?”. Participants were asked to state the degree of reporting incidents: “None”, “Less than half”, “Half”, “More than half”, or “All”. “Half” and “More than half” were collapsed into one category.

The degree of seriousness was measured by one question: “How serious would you rate the worst incident at the time that it occurred”. This item was measured on a scale from 1 to 10, where 1 was labeled “not serious” and 10 labeled “Extremely serious” (Sharipova et al., 2008). The question was repeated for both threats and physical violence.

Finally, the questionnaire included five items concerning attitudes about physical violence and threats; both nonexposed and exposed participants were requested to answer. They were asked to what degree they agreed with the following statements: “Threats and violence are a part of the job”, “You get use to it”, and finally “You have to accept the risk”. Possible answers were: “Totally agree”, “Somewhat agree”, “Neither/nor agree”, “Somewhat disagree”, and “Totally disagree”. In the analyses these responses were collapsed into the categories *agree*, *disagree*, and *neutral*.

## Statistics

Statistical analyses were performed in SPSS, version 18. The results are mainly based on descriptive analyses. In a one-way between-subjects ANOVA, we tested the differences in exposure to threats and to physical violence in the four areas of human service work. To control for multiple testing error we also did the analysis with a Bonferroni-correction and the



**Figure 1.** Degree of reporting.

significance level was set at 0.01; this did not change the statistical significant differences in exposure. Pearson's product-moment correlation was computed to measure the associations between threats or violence and attitudes towards threats and violence in the workplace.

## Results

### *Degree of Reporting Incidents*

The degree of reporting threats and physical violence in writing at the workplace varied somewhat between the four areas of work (see Figure 1). The eldercare had the highest degree of "not reporting" of both threats (58.3%;  $N = 501$ ) and of physical violence (53.5%,  $N = 473$ ); similarly, almost half of the respondents in the PPS did not report neither threats (47%,  $N = 1,584$ ) nor physical violence (48.6%,  $N = 461$ ). In comparison, about one third did not report threats and about one fourth did not report physical violence in SS and in psychiatry. The latter also had the highest degree of reporting "all" incidents of physical violence (31.6%,  $N = 602$ ), while the PPS had the highest degree of reporting "all" threats (20.0%,  $N = 1584$ ).

**Table 2.** One Year Frequency of Different Types of Threats (%).

Frequency of Exposure	Eldercare	Psychiatry	SS	PPS
<b>Written threats</b>				
	N: 898	N: 871	N: 718	N: 2709
Frequent <sup>1</sup>	0	0	0.1	0.1
Occasional <sup>2</sup>	0.6	4.8	2.2	3.0
<b>Threats over the phone</b>				
	N: 899	N: 879	N: 731	N: 2712
Frequent	0	0.6	0	0
Occasional	1.3	14.2	1.5	2.8
<b>Threats of beatings</b>				
	N: 908	N: 896	N: 733	N: 2732
Frequent	5.6	2.9	17.5	0.5
Occasional	16.3	47.9	38.1	20.1
<b>Threats in a scolding manner</b>				
	N: 935	N: 913	N: 738	N: 2778
Frequent	10.1	16.5	34.7	5.0
Occasional	38.3	64	42.5	48.7
<b>Threats in an insulting manner</b>				
	N: 907	N: 907	N: 732	N: 2759
Frequent	6.7	13.8	29.5	4.6
Occasional	29.8	61.3	41.3	40.6
<b>Threats involving objects</b>				
	N: 898	N: 887	N: 736	N: 2717
Frequent	1.0	0.8	11.7	0
Occasional	11.1	37.5	45.7	9.7
<b>Indirect threats (toward family)</b>				
	N: 891	N: 884	N: 729	N: 2736
Frequent	0	0.8	0.5	0.6
Occasional	0.4	27.6	9.6	19.4

Note: SS = Special schools. PPS = Prison and Probation Service. <sup>1</sup>Frequent: "weekly" and "daily". <sup>2</sup>Occasional: "now and then" and "monthly"

### Frequency of Threats and Physical Violence

The most frequent type of threat across all four human service areas of work was threats in a scolding manner, and the second most frequent was threats in an insulting manner (Table 2). The least frequent threats were written threats and threats over the phone.



There seems to be a difference between the four areas of work, in which SS and psychiatry had higher frequencies of threats compared to the eldercare and the PPS. However, among the less frequent threats (written threats, threats over the phone, and indirect threats) psychiatry and the PPS were relatively more exposed.

Physical violence was more frequent in SS than in any of the other area of work (Table 3). Especially scratching/pinching (15.4%), shoving, (12.1%), and hitting (17%). In addition, SS were more exposed to occasional violence, where 57% were exposed to shoving, 49.6% to having a hard object thrown at you, and 46.1% to hitting. Psychiatry also had a relatively high degree of occasional violence, that is, shoving (43%). In the eldercare the most frequent types of occasional violence were: scratching/pinching (28.9%), hitting (21.5%), and shoving (20.2%). Staff in the PPS were the least exposed to both the frequent and occasional violence. In the latter, the most frequent types were: shoving (11.9%), having a hard object thrown at you (7.5%), and spitting (6.5%). Tables 2 and 3 also show that threats had higher frequencies than physical violence. In particular, threats were more common than physical violence in the PPS.

To test whether the differences in exposure were statistically significant an oneway-ANOVA was performed. The test showed that psychiatry and SS differed significantly to other areas with respect to exposure to threats, while eldercare and the PPS were not significantly different from each other (Table 4). However, we found statistically significant differences on exposure to physical violence among all areas of human service work.

### *Perpetrators of Threats and of Physical Violence in the Workplace*

In all areas of human service work about 90% of perpetrators of threats and physical violence were clients, with the exception of the PPS where only 73.7% (physical violence) were clients. In particular, SS reported that 99.8% of both threats and physical violence were from pupils (clients). In all four areas of work, threats were more common than physical violence from client's relatives; 10.1% reported threats from relatives in psychiatry, 8.0% in the PPS, 7.8 % in elder care, and 1.8% in SS. Few were exposed to threats or physical violence from colleagues or superiors (0-3.2%); however, the PPS and the eldercare had more than twice as many threats from colleagues (2.4% and 1.7%) than the other two areas of work. In addition, the PPS had more than four times as many threats from a superior (3.2%) and was the only area

**Table 3.** One Year Frequency of Different Types of Physical Violence (%).

Frequency of Exposure	Eldercare	Psychiatry	SS	PPS
<b>Spitting</b>				
	N: 905	N: 904	N: 734	N: 2736
Frequent	1.2	0	5.7	0
Occasional	13.7	34.3	39.5	6.5
<b>Scratching/pinching</b>				
	N: 912	N: 906	N: 738	N: 2735
Frequent	4.8	1.5	15.4	0
Occasional	28.9	35.5	45.8	3.9
<b>Biting</b>				
	N: 905	N: 904	N: 734	N: 2728
Frequent	0.4	0.2	1.4	0
Occasional	6.9	8.4	28.7	1.1
<b>Being held</b>				
	N: 911	N: 898	N: 726	N: 2733
Frequent	2.2	0.2	0.3	0.1
Occasional	10.9	9.1	5.0	1.5
<b>Shoving</b>				
	N: 907	N: 904	N: 742	N: 2748
Frequent	2.3	0.9	12.1	0
Occasional	20.2	43.0	57.0	11.9
<b>Kicking</b>				
	N: 911	N: 899	N: 745	N: 2732
Frequent	1.3	0.6	11.0	0
Occasional	13.8	26.8	53.6	2.9
<b>Hitting</b>				
	N: 908	N: 913	N: 739	N: 2740
Frequent	3.2	0.8	17.6	0
Occasional	21.5	27.2	46.1	3.0
<b>Hitting with hard object</b>				
	N: 903	N: 900	N: 730	N: 2733
Frequent	0.2	0.1	3.2	0
Occasional	5.8	6.7	30.4	0.7
<b>Having a hard object thrown at you</b>				
	N: 907	N: 903	N: 736	N: 2741
Frequent	0.3	0.2	5.4	0
Occasional	6.7	33.8	49.6	7.5
<b>Punching with a fist</b>				
	N: 909	N: 904	N: 727	N: 2739
Frequent	1.2	0.2	5.4	0
Occasional	10.3	11.0	27.4	2.2
<b>Use of a weapon or weapon like object</b>				
	N: 902	N: 892	N: 732	N: 2731
Frequent	0	0	0.3	0
Occasional	0.3	4.6	10.1	2.2

Note: SS = Special schools. PPS = Prison and Probation Service.

**Table 4.** Differences in Exposure to Threats and Exposure to Physical Violence Among the Four Areas of Human Service Work.

N <sup>i</sup>	Mean	95% CI (Mean)	Post Hoc Test	Mean Difference	95% CI (Difference)	P Value (ANOVA)
<b>Exposure to threats</b>						
Eldercare (N = 900)	1.25	[1.23; 1.28]	Eldercare vs. psychiatry	-0.35*	[-0.40; -0.29]	.000*
			Eldercare vs. SS	-0.50*	[-0.56; -0.44]	.000*
			Eldercare vs. PPS	-0.04	[-0.08; 0.01]	.150
Psychiatry (N = 896)	1.60	[1.57; 1.63]	Psychiatry vs. eldercare	0.35*	[0.29; 0.40]	.000*
			Psychiatry vs. SS	-0.15*	[-0.21; -0.09]	.000*
			Psychiatry vs. PPS	0.31*	[0.27; 0.36]	.000*
SS (N = 733)	1.75	[1.70; 1.80]	SS vs. eldercare	0.50*	[0.44; 0.56]	.000*
			SS vs. psychiatry	0.15*	[0.09; 0.21]	.000*
			SS vs. PPS	0.46*	[0.41; 0.51]	.000*
PPS (N = 2731)	1.29	[1.27; 1.30]	PPS vs. eldercare	0.37	[-0.01; 0.08]	.150
			PPS vs. psychiatry	-0.31*	[-0.36; -0.27]	.000*
			PPS vs. SS	-0.46*	[-0.51; -0.41]	.000*
<b>Exposure to physical violence</b>						
Eldercare (N = 906)	1.19	[1.16; 1.21]	Eldercare vs. psychiatry	-0.06*	[-0.09; -0.02]	.001*
			Eldercare vs. SS	-0.41*	[-0.51; -0.43]	.000*
			Eldercare vs. PPS	0.15*	[0.12; 0.18]	.000*
Psychiatry (N = 904)	1.24	[1.22; 1.26]	Psychiatry vs. eldercare	0.06*	[0.02; 0.09]	.001*
			Psychiatry vs. SS	-0.15*	[-0.45; -0.37]	.000*
			Psychiatry vs. PPS	0.20*	[0.17; 0.23]	.000*
SS (N = 739)	1.65	[1.61; 1.70]	SS vs. eldercare	0.47*	[0.43; 0.51]	.000*
			SS vs. psychiatry	0.41*	[0.37; 0.45]	.000*
			SS vs. PPS	0.61*	[0.58; 0.65]	.000*
PPS (N = 2737)	1.04	[1.03; 1.04]	PPS vs. eldercare	-0.15	[-0.18; -0.12]	.000*
			PPS vs. psychiatry	-0.20*	[-0.23; -0.17]	.000*
			PPS vs. SS	-0.61*	[-0.65; -0.58]	.000*

Note: SS = Special schools. PPS = Prison and Probation Service. \* $P \leq .05$ . <sup>i</sup>Cases are excluded listwise.

that reported physical violence from a superior (0.3%). Only the eldercare and the PPS reported threats or physical violence from subordinates, while psychiatry reported more threats (1.3%) and the PPS more violence (0.7%) from others in comparison to the other areas of work.

**Table 5.** Attitudes About Workplace Violence (%).

N = 5055	1	2	3	4	5
1. Threats of violence	1	.657	-.275	-.276	-.109
2. Physical violence	.657	1	-.17	-.201	-.074
3. "Threats and violence are a part of the job"	-.275	-.17	1	.563	.514
4. "You get used to it"	-.276	-.201	.563	1	.459
5. "You have to accept the risk"	-.109	-.074	.514	.459	1

### Self-Rated Seriousness of the Most Distressing Incident

On a scale of 1 to 10, where 1 was labeled "not serious" and 10 labeled "extremely serious" the mean score was used to compare results from the four areas of work. The most distressing threat in the eldercare ( $n = 495$ ) was rated 4, in both SS ( $n = 605$ ) and the PPS ( $n = 462$ ) it was rated 5, and in psychiatry ( $n = 766$ ) it was rated 6. The most distressing physical violence was rated 6 in both the PPS ( $n = 462$ ) and psychiatry ( $n = 568$ ), while in SS ( $n = 591$ ) it was rated 5, and in the eldercare ( $n = 402$ ) rated 4.

### Attitudes About Workplace Violence

A comparison of attitudes and the four areas of work showed that the majority of respondents in the eldercare and in psychiatry disagreed with the statement "Threats and violence are a part of the job", while more disagreed (47%) than agreed (38.8%) in the PPS (Table 5). In contrast, more respondents in SS agreed (45.5%) than disagreed (40%) with the above statement. The majority disagreed with the statement "You get use to it" in the eldercare, psychiatry, and the PPS. In the case of SS, 42.9% agreed and 46.1% disagreed. More than half of the respondents in eldercare and in psychiatry disagreed with the statement "You have to accept the risk", while more agreed than disagreed in the PPS and SS.

A correlation analysis of the overall association between attitudes and threats and/or violence—using all four areas of work as a combined sample—showed a significant association between the different attitudes and exposure to threats or violence (Table 6). We found exposure to threats to be more strongly associated with these attitudes than exposure to violence. And stronger associations between exposure and "getting used to" and "threats and violence being part of the work" than of "you have to accept the risk".

**Table 6.** Correlation Analysis of Exposure to Threats or Violence and Attitudes Towards Threats or Violence.

Responses	Eldercare	Psychiatry	SS	PPS
<b>1. "Threats and violence are a part of the job"</b>				
	N: 945	N: 923	N: 749	N: 2754
Agree	19.9	31.5	45.5	38.8
Neutral	11.0	10.9	13.9	13.9
Disagree	69.1	57.5	40.6	47.5
<b>2. "You get use to it"</b>				
	N: 944	N: 925	N: 750	N: 2743
Agree	14.6	17.4	42.9	27.3
Neutral	9.4	11.7	10.9	15.4
Disagree	76.0	70.9	46.1	57.3
<b>3. "You have to accept the risk"</b>				
	N: 941	N: 920	N: 750	N: 2753
Agree	27.3	34.8	46.5	47.5
Neutral	12.0	11.2	14.0	13.6
Disagree	60.7	54.0	39.5	38.9

Note: SS = Special schools. PPS = Prison and Probation Service.

## Discussion

The results of the present study show that threats and physical violence is prevalent in human service work. Thus, this discussion will focus on whether the frequency of threats and violence, self-rated seriousness, perpetrator and/or attitudes are related to the degree of reporting incidents to the worksite.

### *Frequency of Threats and/or Physical Violence and Reporting Incidents*

Our results showed that frequency is indeed related to reporting, since for example SS had significantly more incidents of both threats and physical violence than other areas of work, while they also reported more incidents. At the opposite end, the eldercare and the PPS had lower frequencies of threats/violence and a higher degree of "no reporting". This is consistent with findings from Sharipova et al. (2008). An explanation for this general finding could be that more frequent exposure entails an increase of attention and a reduced tolerance toward aggressive incidents.

The present study contributes to the literature by showing that employees in SS are more exposed to threats and physical violence in comparison to

other areas of human service work. This finding cannot be readily explained since there are no studies specifically concerned with identifying risk factors and perceptions of threats or physical violence in SS. One possible explanation may be that in comparison to psychiatry, eldercare, and the PPS no campaigns or otherwise focus on work-related threats/violence have been carried out, which implies that prevention has not been prioritized. In addition, it is possible that the relationship with pupils is qualitatively different, because the employees play a part in the child's upbringing, and as such, may regard themselves as caregivers in a sort of parenting way, and thus the pupil as someone to protect and not to be protected from. In order to improve prevention of threats/violence in SS, further studies are needed to discover the contextual factors related to this work setting.

Furthermore, the result showing that employees in the PPS were the least exposed was somewhat surprising, since criminals are more likely to have a history of violence, which might foster an aggressive environment. One explanation may be that aggressive behavior toward prison staff entails specific sanctions (i.e., prolonged sentence), which may prevent incidents of threats/violence. In addition, most inmates are supposedly of a "sane mind" (in a legal terminology) in comparison with clients in psychiatry, SS, and elderly clients with dementia, who may not be able to understand the consequences of their actions or to resist their impulses. This is also the case when comparing pupils in SS to pupils in other schools.

### *Self-Rated Seriousness, Reporting, and Perpetrators*

In the present study self-rated seriousness was not consistently related to higher reporting of threats or physical violence, which was in contrast to findings by Sharipova et al. (2008). The PPS had a relative high degree of "not reporting", but they rated the incidents as serious as or more serious than any other area of work. However, in all other areas of work the relationship between reporting and the self-rate of seriousness was consistent with the findings by Sharipova et al. (2008). These results suggest that contextual factors may prevent employees in the PPS from reporting threats and violence despite rating these incidents as relatively serious. An explanation may be found in the concept of safety climate or violence climate, which refers to the employees perceptions of organizational policies, practices, and procedures to prevent aggression in the workplace (Brooks, Staniford, Dollard, & Wiseman, 2010; Kessler, Spector, Chang, & Parr, 2008). Central to this concept is the important role of supervisors, for example by modeling civil behaviors, encouraging employees to report, and taking these reports seriously. Thus, if employees in the PPS regard reporting as futile, because their

supervisor does not take the reports seriously, then this could explain why employees do not report even serious incidents. While we need further studies to discover the specific contextual factors for the lack of reporting in the PPS, our results do show that these employees are more exposed to threats and physical violence from superiors suggesting that there is a negative safety or violence climate in the PPS.

Our comparison of self-rated seriousness showed that threats are rated with a similar degree of seriousness as physical violence both within and across areas of work; all incidents fall in between 4 to 6 on the 10-point scale, which could be called the moderate range. This is somewhat surprising since physical violence is often regarded as the more severe trauma, while non-physical incidents are seen as less likely to be experienced as highly threatening to one's wellbeing (Snyder et al., 2007). It is possible that respondents view these scales as having qualitatively different endpoints, in which the worst threat does not equal the worst incident with physical violence. Furthermore, contextual factors within each area of work may influence norms and thereby the rating of what is perceived as a more or less serious incident. However, evidence indicates that threats and physical violence are similarly related to long-term sickness absence (Clausen, Høgh, & Borg, 2011), which suggest that threats do indeed entail consequences comparable to physical violence. These results suggest that definitions of workplace violence that require visible bruises are not sufficient to capture the full impact of threats and physical violence in the workplace. Indeed, there is a need for more studies specifically concerned with the impact of threats.

Previous research indicates that reporting is more frequent when the violence is performed by someone other than clients (Sharipova et al., 2008), which our results did not support. The PPS had more incidents with threats and violence performed by someone else than clients, which was not reflected in higher reporting. As mentioned earlier, this may be explained by a negative safety or violence climate in the PPS, where employees may not trust their supervisors to take reports seriously and/or the supervisors themselves are the perpetrators.

### *Attitudes Toward Threats/Violence and Reporting*

The three statements "Threats and violence are a part of the job", "You get use to it", and "You have to accept the risk" reflect a form of accept or tolerance of threats/violence, and the results show that employees in the eldercare and in psychiatry expressed similar—relatively low levels of accept, since the majority disagreed with these three statements. Employees in the PPS expressed more accept, while employees in SS were the most tolerant with

incidents of threats/violence. This pattern of attitudes does not relate to the frequency of reporting incidents. Interpreting these statements as attitudes of accept or tolerance implies that our results do not confirm Åkerström's (2002) view that employees in caring occupations downplay or accept patient's aggressive actions—in contrast to staff in prisons. One possible explanation for these findings is that psychiatry and eldercare have had an increasing focus on violence prevention, which has provided employees with effective tools to reduce incidents of threats/violence, thereby contributing to the belief that incidents need not be accepted since they may be prevented. This has not yet been the case for SS.

The pattern of attitudes did not consistently relate to exposure. For instance SS and PPS expressed similar high accept of workplace threats/violence, although being at opposite ends concerning degree of exposure. Despite these differences between areas of work our correlation analysis showed that the overall tendency is that attitudes and exposure are significantly related. Indeed, threats seem particularly affected by these attitudes in comparison to exposure to violence. Thus, one could hypothesize that a change in attitudes would more strongly influence incidents of threats than of violence. Furthermore, the notion that “you have to accept the risk” seems to be less dependent on exposure, therefore changing this attitude would not affect exposure to the same degree as a change in “threats and violence is part of the job” and “you get used to it”. These hypotheses could be tested in an intervention design, tailored to a specific area of work, which we are in the process of planning.

## Strengths and Limitations

A major strength of this study is the presence of four major areas of human service work, where the risk of threats and violence is high. Another strength is the high response rate among employees from especially psychiatry, eldercare, and SS. However, the study also has limitations. One was the relatively lower (but still acceptable) response rate in the PPS, which may be partly due to the use of a web-based questionnaire (van Gelder, Bretveld, & Roeleveld, 2010). Another limitation is the use of questionnaires, where data are dependent upon participant's subjective self-reporting, which were not confirmed by other measurements, such as interviews. However, we are in the process of conducting interviews, and these results will be published later.

A further limitation is that the total sample is not representative; therefore, it is not possible to generalize findings. Indeed, the PPS was the only area of work where we included all the staff, making this sample more valid in comparison to other areas, where each worksite chose to participate. This variety



in the sampling procedure may explain some of the differences found in frequencies, since we do not know if worksites chose to participate, because they were more exposed (wish to raise awareness) or perhaps less exposed (wish to strengthen focus on existing programs). According to (Nielsen & Einarsen, 2008) this type of convenience sampling is valid when the objective is to investigate tendencies and not to generalize to the general public. Therefore, we feel the current study still contributes to our understanding of patterns related to threats and physical violence in human service work. Lastly, the four occupational arenas differ in several ways (staff education, type of client, organizational culture, etc.), so further studies should also focus on specific contextual factors.

## **Conclusions**

This comparative study reveals that there are significant differences in the frequency of workplace violence among different areas of human service work, namely psychiatry, eldercare, SS, and the PPS. In particular, employees in SS were frequently exposed. Areas of work with more exposure also had a higher degree of reporting. However, all areas of work had a significant under-reporting of both threats and physical violence, which was not consistently related to self-rated seriousness. Both threats and physical violence were rated within a moderate range of seriousness in all these areas of work. Staffs in SS and in the PPS expressed more accept of workplace threats/violence; when comparing areas of work there were no consistent relationships between attitudes and neither exposure, self-rated seriousness, nor reporting of workplace violence. However, attitudes and exposure were significantly related when analyzing all areas of work as a combined sample. More knowledge is needed to understand the relationship between exposure, work environment, and attitudes about workplace threats and violence.

Workplace threats and violence toward staff in human service work is a widespread phenomenon that requires continued research and strategies aimed at decreasing its scope and consequences. Further studies should focus on the impact of threats, and also more research is needed on threats and violence in SS. Furthermore, studies exploring risk factors in a prospective design are needed in order to improve the prevention of threats and physical violence in the workplace.

## **Acknowledgment**

The authors would like to thank Dorte Raaby Andersen for her help in administrating the survey. We would also like to thank the participating worksites for their involvement in the study.

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was funded by The Danish Working Environment Research Fund.

### References

- Åkerström, M. (2002). Slaps, punches, pinches—but not violence: Boundary-work in nursing homes for the elderly. *Symbolic Interaction, 25*, 515-536.
- Bilgin, H., & Buzlu, S. (2006). A study of psychiatric nurses' beliefs and attitudes about work safety and assaults in Turkey. *Issues in Mental Health Nursing, 27*, 75-90.
- Brooks, B., Staniford, A., Dollard, M., & Wiseman, R. J. (2010). Risk factors, consequences, and management of aggression in healthcare environments. In J. Houdmont & L. Stavroula (Eds.), *Contemporary occupational health psychology. Global perspectives on research and practice* (pp. 329-353). Chichester, UK: Wiley-Blackwell, John Wiley.
- Campbell, J. V., Messing, J. T., Kub, J., Agnew, J., Fitzgerald, S., Fowler, B., & Bolyard, R. (2011). Workplace violence. Prevalence and risk factors in the safe at work study. *Journal of Occupational and Environmental Medicine, 53*, 82-89.
- Carmel, H., & Hunter, M. (1993). Staff injuries from patient attack: Five years' data. *Bulletin of the American Academy of Psychiatry & the Law, 21*, 485-493.
- Clausen, T., Hogh, A., & Borg, V. (2011). Acts of offensive behaviour and risk of long-term sickness absence in the Danish elder-care services: A prospective analysis of register-based outcomes. *International Archives of Occupational and Environmental Health*. Advance online publication. <http://dx.doi.org/10.1007/s00420-011-0680-1>
- Gerberich, S. G., Nachreiner, N. M., Ryan, A. D., Church, T. R., McGovern, P. M., Geisser, M. S., & Pinder, E. D. (2011). Violence against educators: A population-based study. *Journal of Occupational and Environmental Medicine, 53*, 294-302.
- Hogh, A., Sharipova, M., & Borg, V. (2008). Incidence and recurrent work-related violence towards healthcare workers and subsequent health effects. A one-year follow-up study. *Scandinavian Journal of Public Health, 36*, 706-712.
- Hogh, A., & Viitasara, E. (2005). A systematic review of longitudinal studies of nonfatal workplace violence. *European Journal of Work and Organizational Psychology, 14*, 291-313.
- Kessler, S. R., Spector, P. E., Chang, C., & Parr, A. D. (2008). Organizational violence and aggression: Development of the three-factor violence climate survey. *Work and Stress, 22*, 108-124.

- Klein, P. J., Gerberich, S. G., Gibson, R. W., Maldonado, G., Kruttschnitt, C., Larntz, K., & Renier, C. (1997). Risk factors for work-related violent victimization. *Epidemiology*, *8*, 408-413.
- Lawoko, S., Soares, J. J. F., & Nolan, P. (2004). Violence towards psychiatric staff: A comparison of gender, job, and environmental characteristics in England and Sweden. *Work and Stress*, *18*, 39-55.
- Leather, P., Lawrence, C., Beale, D., & Dickson, R. (1998). Exposure to occupational violence and the buffering effects of intra-organizational support. *Work and Stress*, *12*, 161-178.
- Menckel, E., & Viitasara, E. (2002). Threats and violence in Swedish care and welfare—Magnitude of the problem and impact on municipal personnel. *Scandinavian Journal of Caring Science*, *16*, 376-385.
- Nabe-Nielsen, K., Tüchsen, F., Christensen, K. B., Garde, A. H., & Diderichsen, F. (2009). Differences between day and non-day workers in exposure to physical and psychosocial work factors in the Danish eldercare sector. *Scandinavian Journal of Work, Environment, and Health*, *35*, 48-55.
- Nielsen, M. B., & Einarsen, S. (2008). Sampling in research on interpersonal aggression. *Aggressive Behavior*, *34*, 265-272.
- Poster, E. C. (1996). A multinational study of psychiatric nursing staff's beliefs and concerns about work safety and patient assault. *Archives of Psychiatric Nursing*, *10*, 365-373.
- Safran, D. A., & Tartaglino, A. J. (1998). Workplace violence in an urban jail setting. In G. R. Vandenbos & E. Q. Bulatao (Eds.), *Violence on the job. Identifying risks and developing solutions* (pp. 207-216). Washington, DC: American Psychological Association.
- Schat, A. C. H., & Kelloway, E. K. (2005). Workplace aggression. In J. Barling, E. K. Kelloway & M. Frone (Eds.), *Handbook of work stress*. (Chap. 8, pp. 189-218). Thousand Oaks, CA: SAGE.
- Sharipova, M., Borg, V., & Høgh, A. (2008). Prevalence, seriousness, and reporting of work-related violence in the Danish elderly care. *Scandinavian Journal of Caring Science*, *22*, 574-581.
- Snyder, L. A., Chen, P. Y., & Vacha-Haase, T. (2007). The underreporting gap in aggressive incidents from geriatric patients against certified nursing assistants. *Violence & Victims*, *22*, 367-379.
- U.S. Department of Labor, U.S. Bureau of Labor Statistics (2005). *Survey of workplace violence prevention*. Retrieved from <http://www.bls.gov/iif/home.htm>
- U.S. Department of Labor, U.S. Bureau of Labor Statistics (2011). *Women in the labor force: A databook* (2011 ed., Table 11). Retrieved from <http://www.bls.gov/cps/wlf-databook2011.htm>
- van Gelder, M. M. H. J., Bretveld, R. W., & Roeleveld, N. (2010). Web-based questionnaires: The future in epidemiology? *American Journal of Epidemiology*, *172*, 1292-1298.
- Wilson, C. M., Douglas, K. S., & Lyon, D. R. (2011). Violence against teachers: Prevalence and consequences. *Journal of Interpersonal Violence*, *26*, 2353-2371.

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## **PAPER II**

**Effects of Violence Prevention Behavior on Exposure to Workplace Violence and Threats: A Follow-up Study**

**RESUBMITTED TO JOURNAL OF INTERPERSONAL VIOLENCE**

**2015**

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*Effects of Violence Prevention Behavior on Exposure to Workplace Violence and Threats: A Follow-up Study*

**Abstract**

This longitudinal study investigates the relationship between enacted violence prevention policies (prevention behaviors) at top management level, supervisor level and among co-workers and exposure to workplace violence and threats across four different high risk work sectors: psychiatry, special schools, eldercare, and the prison and probation services. Logistic regression analysis of a 1-year follow-up sample of 3.016 employees from these four sectors shows that prevention behaviors are significantly negatively associated with a lower level of self-reported exposure to workplace violence and threats – in the prison and probation services, eldercare, and in psychiatry, while no significant associations are found for special schools. The results therefore show clear sector differences with regard to the preventative effect of violence prevention behaviors. Further, this multi-sector comparison suggests that overall prevention behaviors may be more effective in relation to a relatively moderate frequency of violence and threats, and that only top management prevention behavior may prevent very frequent incidents (OR=0.58), while it may not affect infrequent exposure to workplace violence.

These results imply that when managing workplace violence in high-risk areas of human service work there should be emphasis on the use of violence prevention behaviors from top management, supervisor and among co-workers. However, type of sector and the frequency of workplace violence should be analyzed in order to evaluate the potential impact of prevention behaviors.

**Keywords:**

Threats, physical violence, human service work, follow-up study, prevention behavior

## Introduction

Workplace violence and threats of violence are considered one of the principal occupational health hazards for many people at work (Leather & Zarola, 2010). Reviews have shown that exposure to workplace violence and threats is particularly high in service and human service sectors, such as healthcare, education, public safety, retail, and justice industries (Hogh & Viitasara, 2005; Piquero, Piquero, Craig, & Clipper, 2013; Spector, Zhou, & Che, 2014). The literature shows exposure rates as high as 66.9% for nonphysical violence and 36.4% for physical violence for nurses (Spector et al., 2014), and among special educators 42.3% for nonphysical violence and 21.7% for physical violence (Tiesman, Konda, Hendricks, Mercer, & Amandus, 2013). Further, among U.S. correctional officers, from 1999-2008, there were 125,200 non-fatal injuries and 113 fatal injuries of which 38-40% were due to assaults and violent acts (Konda, Reichard, & Tiesman, 2012). These exposure estimates all warrant preventative action, however, a review of the literature on intervention effectiveness shows that there is much variability among studies in the types and effectiveness of intervention (Wassel, 2009). In fact, training has both been related to 50% decreases in violent interaction at 3-month follow-up (Fernandes et al., 2002) and two-fold increases in the frequency of assaults when comparing data 12-month prior to the training and 11 months after training (Wilkinson, 1999). A study on organizational policies showed significant reduced risk (OR= 0.5) related to 'zero tolerance' for violence and a list of prohibited violent behaviors (Nachreiner et al., 2005). However, the policy of 'zero tolerance' has also been related to an increase of reporting incidents by 85% during the following year ([www.arbejdsmiljoviden.dk](http://www.arbejdsmiljoviden.dk), 2013). Thus, more research is needed to uncover effective prevention of workplace violence.

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Over more than 30 years, a strong theoretical and empirical base has been developed under the rubric of safety climate, which refers to shared perceptions among members of the organization regarding safety policies, procedures, and practices (Zohar, 1980; Zohar & Luria, 2003; Zohar & Luria, 2005; Zohar, 2010). Evidence shows that safety climate is important for predicting individual safety behaviour, industrial accidents, and treatment errors in healthcare (Silva, Lima, & Baptista, 2004; Cooper & Phillips, 2004; Johnson, 2007; Naveh, Katz-Navon, & Stern, 2005). Spector and colleagues (2007) were the first to extend the idea of safety climate to the context of workplace violence, and they coined the term perceived violence prevention climate (Spector, Coulter, Stockwell, & Matz, 2007). Their study of 198 female nurses showed that violence prevention climate was significantly and negatively related to violence, verbal aggression, injury, and perceived danger. Kessler and colleagues (2008) refined the violence prevention climate construct by developing it as a multidimensional construct: Policies and procedures, Practices and responses, and Pressure for unsafe practice (Kessler, Spector, Chang, & Parr, 2008). The policies dimension refers to an employee's awareness of the formal regulations and formal distribution of information, such as through training, whereas the practices and responses dimension refers to how management adheres to these formal regulations and their response to violent incidents. Thus, policies represent espoused priorities and desired behaviors, while practices and responses represent the enacted counterpart. Kessler and colleagues suggested that practices may supersede policies when management chooses to ignore or even contradict policy. The former two dimensions were included in Spector and colleagues' original construct, while Kessler and colleagues added the latter dimension, which refers to employees' perception of pressure to ignore the violence prevention policies and procedures in order to meet other demands. Their study of 216 psychology students, who also had at least 31 hours employment within a variety of jobs and work sectors, showed that the dimension of practices and responses may be the most important predictor of physical violence,



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whereas policies and procedures may be more relevant for exposure to verbal aggression. They concluded that the response of supervisors to violent behaviors might well be more effective in curtailing violence than prevention policies alone. Chang and colleagues (2012) conceptualized poor violence prevention climate as a stressor associated with increased strain and reduced prevention motivation (Chang, Eatough, Spector, & Kessler, 2012). Their study of 172 employee and co-worker dyads showed that the practices and responses dimension may be the most important element, considering that it was linked to prevention behavior (complying with and participation in prevention) through both strains and motivation. Again, this finding was related to the importance of management reactions to assaults. The above studies on violence prevention climate are limited due to the use of cross-sectional designs, questionable heterogeneity, and lack of adequate information about response rates. However, one longitudinal study on violence prevention climate has been conducted (Yang, Spector, Chang, Gallant-Roman, & Powell, 2012). This study found that only the dimension of 'Pressure for unsafe practice' was related to risk of being exposed to physical violence over six months (odds ratio 1.69). This result contradicts findings from the former studies, where the dimension of practices and responses is seen as the more important element of violence prevention climate. However, there are important limitations to this longitudinal study. Although they invited 1565 nurses to participate, only 176 nurses completed both surveys, which corresponds to a follow-up response rate of only 11%. Thus, there is still a need for a longitudinal study examining the effects of violence prevention climate on exposure to workplace violence, particularly investigating the potential effects of prevention behaviors inherent to the dimension of practices and responses.

Although both Kessler and colleagues (2012) and Chang and colleagues (2012) emphasize the response to incidents of violence in order to effectively curtail violence, the dimension of practices and responses does not include social support after incidents of violence.

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This is surprising, considering findings on the important role of social support from supervisor (and co-workers) after exposure to violence and threats (Schat & Kelloway, 2003; Leather, Lawrence, Beale, & Dickson, 1998). However, the absence of support may relate to the original construct of safety climate in relation to industrial accidents, where individual factors and accident proneness has little effect on future accidents (Guastello, 1993). Conversely, findings from research on workplace violence show that prior exposure significantly increases the risk of reoccurrence (Beale, Clarke, Cox, Leather, & Lawrence, 1999; Nachreiner et al., 2012; Hogh, Sharipova, & Borg, 2008). Thus, a history of workplace violence is of concern, which warrants preventative attention. In theory, social support may reduce future exposure by alleviating the victim's symptoms of strain. These various strains may reduce capabilities to comply with prevention policies (Chang et al., 2012) and may increase aggressive outbursts due to a lack of mental resources (Aquino & Thau, 2009; Felson, 1992). In particular, Schat & Kelloway (2003) found that supervisor and co-worker support after incidents of violence can alleviate the negative effects on employees' emotional well-being, somatic health, and job-related affect. Other studies have incorporated support from co-workers in their safety climate measure and found negative associations with prevalence of verbal abuse (Gimeno, Barrientos-Gutierrez, Burau, & Felknor, 2012; Gimeno, Felknor, Burau, Delclos, & Barrientos-Gutierrez, 2007). In sum, theory and evidence suggests that effective violence prevention policies and the enacted counterpart, prevention behaviors, should include social support after incidents of workplace violence.

Kessler and colleagues (2012) and Chang and colleagues (2012) also emphasize the role of management in order to effectively curtail violence. However, the violence prevention climate construct does not distinguish between levels of management, e.g. supervisor or top management. Evidence from research on safety climate has shown that both top level management and supervisor level management may influence employee behavior (Zohar & Luria, 2003; Zohar &

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Luria, 2005). In particular, supervisory safety practices must be supported by higher-level management through communication of safety priorities, even under increased work pressure. In the context of workplace violence, top management may prevent future employee exposure to violence directly by for example considering prevention in decisions concerning staffing and intake of clients. In contrast to top management, supervisors have day-to-day interaction with employees and may thus directly affect future exposure by encouraging formal reporting of incidents and taking reports seriously, thereby informing specific prevention strategies. Moreover, the above results concerning social support also provided evidence for the potential preventative role of co-workers (Gimeno et al., 2007; Gimeno et al., 2012; Schat & Kelloway, 2003). The influence of co-workers may be of considerable strength if informal groups or informal leadership has developed; these informal work groups serve as guides to correct behavior and may exercise pressure to conform to these group standards and norms (Schein, 2010; Hussein, 1989). Thus, if an informal group of co-workers value violence prevention, this may directly affect the frequency of engaging in prevention behaviors, thereby also influencing the potential preventative effects of enacted policies.

No studies on violence prevention climate have been stratified in order to test for sector differences, which is likely to overlook structural and organizational differences (Tobin, 2001). Viitasara and Menckel (2002) described a structural level of risk factors associated with workplace violence, which involves type of local-government unit to which the organization belongs, management, direction and control, policy, financing, both physical and psychosocial work-environments, personnel, and education/training. Although human service sectors broadly are related to increased risk of workplace violence (Piquero et al., 2013; Hogh & Viitasara, 2005), structural factors in these sectors may vary considerably as a function of specific interpersonal challenges related to type of client and treatment goals. Indeed, a comparative study of four high-risk sectors, showed significant differences in the frequency of threats and violence (Rasmussen,

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Hogh, & Andersen, 2013), thus implying plausible effects related to sector. Therefore, more specific prevention effects may be investigated when stratifying for sector difference.

In sum, while the practices and responses dimension has much to offer with regard to analyzing enacted policies and the potential preventative effects, there are empirical and theoretical reasons for refining categories; this concerns specifying prevention behaviors at different levels within an organizational hierarchy, e.g. co-workers, supervisors and top management, and including the aspect of social support. The current study allows for a multi-sector comparison investigating the following research questions:

1. What is the association between violence-prevention behaviors and self-reported exposure to violence or threats at follow-up?
2. Which differences in the relationship between violence-prevention behaviors and self-reported exposure to violence or threats exists across different work sectors?

## **Method/ Procedure**

### **Participants**

The study population consists of a follow-up sample. The baseline study, described in Rasmussen and colleagues (2013), including 5497 employees from psychiatry, special schools, eldercare, and the prison and probation services. Altogether, 3584 participated in the follow-up study with an overall follow-up response rate of 65% (See Figure 1). However, seeing that this study revolves around the perception of management, we further excluded all those with supervisory responsibilities at both line and top management level. Thus, the study sample consists of: Psychiatry (n=617), special schools (n=511), eldercare (n=577), and the prison and probation services (n=1311); a total of 3016 participants.

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Figure 1 about here

### Data collection

A web-based questionnaire was used for participants in the prison and probation services; participants from the other work sectors completed written questionnaires during a planned meeting at the worksite. It was stated in the cover letter of the questionnaire that participation in the study was voluntary and that the data would be treated confidentially. The baseline data collection took place in the period between May and October 2010 and the follow-up was conducted in the same period in 2011. The study was approved by the Danish Data Protection Agency, and followed the regulations for data storage and protection. Respondents were identified by questionnaire numbers, which only members of the research group could link to civil registration numbers. This procedure was to ensure accurate matching of questionnaires from the two rounds of data collection.

### Measures

#### Prevention behaviors measured at baseline

Three items inspired by Zohar & Luria's (2005) scale for measuring Organizational-Level Safety Climate were used to measure employees' perception of top management prevention behavior. Item example: "(top management) Considers violence-prevention in decisions concerning staffing and intake of clients". Perception of supervisor prevention behavior was measured with four items from Spector and colleagues (2007). Item example: "Your supervisor encourages staff to report *physical* violence". We added an item concerning supervisory support inspired by Vegchel and colleagues (2004), item text: "Your supervisor gives sufficient help and support after a violent or threatening incident". Co-worker prevention behaviors were construed similar to items on supervisor behavior (Spector et al., 2007), with the exception of "...takes reports of workplace violence seriously".

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Items were translated into Danish and supplemented with a context-specific introduction using organizational terms for the relevant supervisor or top management. Respondents were asked to rate how much they agreed with the statement; using a five-point response scale ranging from “Not at all” to “Very high degree” supplemented with “Do not know”. The “Do not know” response category was used in Spector and colleagues (2007) and scored in between “No” and “Yes”. Conceptually, this means that being unaware of prevention behaviors represents a weak practice concerning violence prevention. For the current study, however, respondents primarily replying “Do not know” were excluded from the main analyses in order to avoid confounding between being unaware of violence prevention, and being aware that there is a lack of violence prevention. The former may be a mere lack of awareness on the part of the individual (possibly about prevention initiatives that are occurring). The latter involves an organization that is failing to engage in violence prevention. The former (lack of awareness), would be a concern, but a worker in an environment where prevention is taking place, but of which they are unaware, may still be protected from violence, by virtue of the organization taking steps to prevent it. However, in the latter context, there is a lack of prevention, which may put the worker at risk. The exclusion of “Do not know” followed the general procedure for missing, in that respondents must answer more than half of the items in a scale to be included in that scale. Thus, the three scales were scored from 0 (“Not at all”) to 4 (“Very high degree”). Items and Cronbach’s alpha for the three scales are shown in table 1.

Table 1 about here

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**Threats of violence and physical violence measured at follow-up**

Respondents were asked whether they had experienced the following acts of threatening behaviors at their current worksite within the past 12 months: threats of beatings, written threats, threats in a scolding manner, threats in an insulting manner, threats over the phone, threats involving objects, and indirect threats (toward family). Similarly, respondents were asked whether they had experienced the following acts of physically violent behaviors: spitting, hitting, hitting with object, scratching/pinching, shoving, being held, punching with a fist, kicking, biting, having a hard object thrown at you, and use of a weapon or weapon like object (Menckel & Viitasara, 2002). Response categories were: (1) Yes, daily; (2) Yes, weekly; (3) Yes, monthly; (4) Yes, now and then; and (5) No, never. Using this as a continuous measure we saw problems with the statistical assumptions of normality and homoskedasticity, therefore the scale was dichotomized. We chose to dichotomize at the 75<sup>th</sup> percentile recognizing that in these high risk work sectors, some exposure to violence or threats is widespread. Thus, the analyses would identify associations with high exposure relative to low exposure. However, due to low frequencies of physical violence in the prison and probation services the violence scale was here collapsed into two categories: (1) Yes, exposed (daily, weekly, monthly, now and then), and (0) Not exposed (never). A descriptive account of the relative frequencies of workplace violence across sectors is given in table 1, using types of violent and threatening behaviours as two continuous measures scored from 0-100. Cronbach's alphas across sectors were 0.7-0.9 for both scales.

The exposed participants were asked who the perpetrator(s) were: "A client", "A relative to the client", "A co-worker", "A superior", "A subordinate", and "Other people". This item was made to fit the specific work sector by exchanging "client" with either "pupil", "patient", "elderly citizen", or "inmate". It was possible to report several perpetrators.

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**Covariates measured at baseline**

While the analyses were stratified for sector differences, we included controls for individual factors such as gender and seniority, as these have been related to risk of workplace violence (Hogh & Viitasara, 2005; Lawoko, Soares, & Nolan, 2004). Seniority, in particular, may also affect engaging in violence-prevention due to more experience concerning policies and participation in various training programmes. We further considered controlling for working permanent night or evening shifts, thus controlling for supposed differences in staff-supervisor interaction rates. However, correlation analyses (not shown) revealed no significant correlations with any of our three predictors (prevention behaviors). Therefore, time of work was not included in the main analyses.

**Data analyses**

As we sought to identify predictors of binary measures of workplace threats and violence, we analyzed our data using logistic regression. Associations were estimated by odds ratios (OR) and 95% confidence intervals. We were particularly interested in whether the OR was less than 1 indicating that strong prevention behavior - as opposed to weak behavior - was negatively related to high violence or threats – as opposed to low exposure. Gender, seniority and baseline exposure were included in all analyses. SPSS 20 was used to conduct the statistical analysis.

**Results**

In eldercare, psychiatry, and special schools 99-100% of threats and violence were perpetrated by clients, while in the prison and probation services 94% of threats and 98% violence were perpetrated by clients. Thus, across sectors exposed participants reported clients to be responsible for almost all incidents of workplace violence. The descriptive account of the relative frequency of threats and violence across sectors shows that special schools have the highest mean values of both threats and violence (Table 2). Psychiatry has the second highest overall mean levels of threats and violence. The prison and probation services have a higher mean value for threats in



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comparison to eldercare, while eldercare has a higher mean value of violence in comparison to the prison and probation services. This pattern is similar to baseline findings (Rasmussen, Høgh, & Andersen, 2013). Descriptive results on prevention behaviors show that top management behavior has the lowest mean level in all sectors (See Table 2). In psychiatry, special schools, and the prison and probation services co-worker prevention behavior have slightly higher means than supervisor behavior.

The logistic bivariate analyses of the odds of physical violence by prevention behavior, gender, seniority, and baseline violence yielded some statistically significant associations (Table 3). In psychiatry, all three types of prevention behaviors were significantly associated with lower self-reported exposure to violence (OR's from 0.52-0.72). In the prison and probation services and eldercare, both supervisor and co-worker prevention behaviors were significantly associated with lower self-reported exposure to violence (OR's from 0.53-0.78). No significant associations were found for special schools.

Table 2 about here

The logistic bivariate analyses of the odds of threats by prevention behavior, gender, seniority, and baseline threats also yielded some statistically significant associations (Table 3). In the prison and probation services and eldercare, all three types of prevention behaviors were significantly associated with lower self-reported exposure to threats (OR's from 0.58-0.81), although top management prevention behavior in the eldercare was borderline significant (OR=0.75, CI=0.57-0.996). In psychiatry, top management prevention behavior was significantly associated with lower self-reported exposure to threats (OR = 0.58). No significant associations were found for special schools.

Table 3 about here

## Discussion

The results of this longitudinal study demonstrate that violence prevention behaviors are significantly and negatively associated with lower self-reported exposure to violence and threats of violence at follow-up (research question 1). This corresponds well with and extends results from existing cross-sectional studies (Chang et al., 2012; Gimeno et al., 2012; Kessler et al., 2008; Lipscomb et al., 2012; Spector et al., 2007). Furthermore, the current results show similar and different trends within and across sectors with regard to the preventative effects of prevention behaviors (research question 2). In psychiatry, prevention behaviors overall had a more preventative effect on physical violence in comparison to threats of violence. This is in line with results from Kessler and colleagues (2008) who found that the dimension of practices and responses was a more important predictor for physical violence than verbal aggression. Furthermore, in psychiatry, top management prevention behavior was the only prevention measure that affected both violence and threats, while in eldercare and the prison and probation services, top management was the only prevention measure that did *not* affect both violence and threats. Moreover, results on eldercare and the prison and probation services showed that prevention behaviors overall had a more preventative effect on threats in contrast to violence. This differed from results on psychiatry. No results on special schools were significant and only by controlling for the baseline measure of self-reported exposure did model-fit indices reach significant  $\chi^2$ . This suggests that prevention behaviors do not fit the hypothesized model indicating that this work sector is qualitatively different from the other three sectors.

The different effects of prevention behaviors may reflect sector specific profiles with regard to structural or organizational qualities and frequencies of threats and violence. The high frequencies of threats and violence in special schools, implying that most employees are at high risk (Rasmussen et al., 2013), may explain why the current analyses did not find significant associations

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with high exposure contrary to low exposure. Moreover, at the time of data-collection there was limited knowledge on the scope of workplace violence in special schools, which may correspond to a less distinct tradition for prevention strategies in comparison to the other three sectors. Later studies, however, have shown that special education teachers are at a significant higher risk in comparison to other education workers (Gerberich et al., 2011; Tiesman et al., 2013). Furthermore, employees in special schools may regard themselves as caregivers in a sort of parenting way, and the student as someone to protect and not to be protected from. Labeling or pushing aside incidents as violence has been studied by Åkerström (2002), who describes a tendency to determine what a phenomenon is according to *who* is involved instead of *what* he or she does. How clients are typified may influence the interpretation of actions thereby also affecting (preventative) reactions. Thus, responding to threatening or violent behavior by a special school student may be perceived in terms of learning objectives in contrast to violence prevention.

In psychiatry, prevention was overall more effective with regard to violence as opposed to threats, which may reflect that it is more difficult to prevent very frequent incidents, such as threats in psychiatry. It may be that the frequency of threats is related to staffing norms and the intake of patients, thereby amenable only to top management prevention behavior (OR = 0.58). Overcrowding and staffing norms have been widely debated in Denmark due to many financial cut-backs in hospitals and long wait-list for psychiatric treatment. Another possible explanation may be that formal reporting of very frequent incidents is very time consuming and therefore it is tacitly accepted that this is not feasible or necessary. Researchers have suggested that if there is a high frequency of incidents then it might be appropriate to periodically have 'reporting weeks', where employees are requested to report all incidents (Beale, Cox, & Leather, 1996). Thus giving a truer picture of the day-to-day frequency of threats and thereby informing relevant prevention strategies.

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In psychiatry, supervisor prevention behavior, surprisingly, was positively associated with self-reported exposure to threats (OR = 1.30), albeit this association was not significant. Thus, although, supervisors may be attentive to violence prevention by encouraging reporting and giving support, it does not prevent exposure to threats. Instead, those employees experiencing supervisor prevention behaviors may also be those consistently being exposed to threats. In contrast, safety research suggests that more frequent supervisory safety-oriented interaction will increase workers' safety behaviors (such as use of protective gear), and that failure to use protective gear accounts for 40% of work accidents (Zohar & Luria, 2003). Thus, the differential effect of supervisory prevention behavior may relate to available intervention and effectiveness of this intervention. The prevention of workplace threats, in contrast to industrial accidents, may not have a technical nor an accessible solution, such as using protective gear, but may involve more complex and time consuming efforts with varying degrees of effectiveness (Wassel, 2009). The positive association between prevention and the reporting of incidents has also been found in an intervention study by Arnetz and Arnetz (2000), in which the intervention group reported 50% more violent incidents than their control group. The authors suggested that this increase in reporting was related to a heightened awareness and possibly a supportive environment to sustain reporting of incidents. This reflects the complexity in measuring the effectiveness of violence prevention.

The similar trends of preventative effects of prevention behaviors between the prison and probations services and eldercare may also reflect their more similar frequencies of threats and violence. Both sectors have non-significant associations between top management prevention behavior and violence, suggesting that with mean exposure levels below 2.7 only supervisors and co-workers are involved in prevention behaviors. Furthermore, the mean levels of threats in eldercare (4.9) and the prison and probations services (7.5) were comparable to the mean level of violence in psychiatry (6.1), suggesting that prevention behaviors are more effective with a

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moderate frequency of incidents. Thus, supervisor and co-worker prevention behavior may be effective with a relatively moderate degree of violence or threats, while only top-management may affect relatively high levels of threats or violence and may not have any effect on relatively low levels of violence.

In the current study we argue that respondents replying primarily “Do not know” to items on the violence prevention scales should be excluded from the main analyses in order to avoid confounding between being unaware of violence prevention, and being aware that there is a lack of violence prevention. However, this negatively affected the size of the analytical sample; particularly with respect to the dimension of top management. It has been suggested that non-response to questions concerning management may be related to people working in loose networks with changing leaders, several leaders or no leaders; implying that questions assuming the “normal” hierarchy at the workplace may face increasing problems with missing values (Kristensen, Hannerz, Høgh, & Borg, 2005). For the current study, we did some supplementary exploratory analyses (data not shown) in order to ascertain possible bias as a consequence of many missing due to the exclusion of “Do not know” on prevention measures. A comparison on demographics between included and excluded respondents showed that the latter consistently had lower seniority. However, this may not have biased our findings seeing that we adjusted for seniority in our main analyses.

Our measures of prevention behaviors are closely related to the practices and response dimension used in studies on violence prevention climate (Kessler et al., 2008; Spector et al., 2007; Yang et al., 2012). The only longitudinal study did not find a statistically significant association between prevention practices at time 1 and violence exposure at time 2 (6 month follow-up). The current study, therefore, contributes to the literature by showing significant associations using a large heterogenic sample and follow-up data with acceptable response rates. Although our

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prevention behavior measures are closely linked to the measures used for the dimension of practices and responses, they are not identical. The current study specified prevention behaviors at different levels within an organizational hierarchy, e.g. co-workers, supervisors and top management, and included the aspect of social support. Descriptive results showed that co-worker prevention behavior had slightly higher means, suggesting that employees perceive co-workers to be the most engaged in prevention behaviors. In terms of informal groups, this type of behavior would be considered a collaboration with the formal organization as a result of a common interest (Hussein, 1989). The preventative effect was parallel to the effect of supervisor behavior, although the latter had a slightly stronger influence on self-reported exposure at follow-up. This again emphasizes the role of supervisors in order to effectively prevent workplace violence and threats, in line with studies on violence prevention climate (Chang et al., 2012; Kessler et al., 2008). Further, it is possible that this study has found more significant effects in comparison to Yang and colleagues (2012) due to the inclusion of social support. By including items on social support this study expands on existing evidence for the important role of supervisor and co-worker responses after exposure to violence and threats (Schat & Kelloway, 2003; Leather et al., 1998). Thus, the present results suggest that violence prevention policies and the enacted counterpart should involve social support from co-workers and supervisors after incidents of threats and violence.

**Strengths and limitations**

A significant strength of the present study is the use of a follow-up sample with acceptable response rates at both baseline and follow-up. Another significant strength is that data allowed for a multi-sector comparison, which provided novel longitudinal evidence for sector differences with regard to the association between prevention behaviors and workplace violence and threats. Also, using a longitudinal design reduces bias among measures.

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However, the study also has limitations. Using only the survey method induces risk of single source bias, however, this approach is consistent with studies on workplace violence and prevention climates (Yang et al., 2012; Spector et al., 2007; Kessler et al., 2008; Gimeno et al., 2012; Lipscomb et al., 2012). Future studies may further explore our findings by use of interviews and intervention designs. Also, dichotomizing measures means that we lose some information and therefore we are perhaps simplifying the relationships in question. However, dichotomizing also has some advantages (Farrington & Loeber, 2000). For example, it makes the interpretation of the results more intuitive because we do not have to translate what a step on a scale equals in practical terms. Further, most research on workplace violence and safety or violence-prevention climate has studied individual experiences of climate, despite climate being conceptualized as shared perception across individuals (Zohar, 2000; Zohar & Luria, 2005; Zohar, 1980; Zohar, 2010). This limitation also has some merit for our findings, though we only explore one aspect of a possible aggregate level climate, namely prevention behaviors. Lastly, while the entire sector of the prison and probation services participated, data from the other three sectors was collected by use of non-random sampling, also described in Rasmussen and colleagues (2013). However, the results show similar findings between particularly eldercare and the prison and probation services, suggesting that sampling procedures may not infer substantial bias for the associations explored.

### **Conclusion and implications**

This longitudinal study confirms that enacted prevention policies (prevention behaviors) at top management level, supervisor level and among co-workers are associated with lower self-reported exposure to workplace violence and threats – in the prison and probation services, eldercare, and in psychiatry, while no significant associations were found for special schools. This multi-sector comparison showed that prevention behaviors overall may be more

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effective with a relatively moderate frequency of exposure, as seen for threats in eldercare and the prison and probation services and for violence in psychiatry. Supervisor and co-worker prevention behaviors may also be effective for infrequent exposure, such as for violence in eldercare and the prison and probation services. Top management, on the other hand, may not affect infrequent exposure, but may be the only prevention behavior to affect very frequent incidents (OR=0.58), such as threats in psychiatry.

These results imply that when managing workplace violence in high-risk areas of human service work there should be emphasis on the use of prevention behaviors from top management, supervisor and among co-workers. However, organizational context and the frequency of workplace violence should be analyzed in order to evaluate the potential impact of prevention behaviors.

Reference List

- Åkerström, M. (2002). Slaps, punches, pinches - but not violence: Boundary-work in nursing homes for the elderly. *Symbolic interaction, 25*, 515-536.
- Aquino, K. & Thau, S. (2009). Workplace victimization: Aggression from the target's perspective. *Annual Review of Psychology, 60*, 717-741.
- Arnetz, J. E. & Arnetz, B. B. (2000). Implementation and evaluation of a practical intervention programme for dealing with violence towards health care workers. *Journal of Advanced Nursing, 31*, 668-80.
- Beale, D., Cox, T., & Leather, P. (1996). Work-related violence - is national reporting good enough? *Work and stress, 10*, 99-103.



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- Beale, D., Clarke, D., Cox, T., Leather, P., & Lawrence, C. (1999). System memory in violent incidents: Evidence from patterns of reoccurrence. *Journal of Occupational Health Psychology, 4*, 233-244.
- Chang, C., Eatough, E. M., Spector, P. E., & Kessler, S. R. (2012). Violence-prevention climate, exposure to violence and aggression, and prevention behavior: A mediation model. *Journal of Organizational Behavior, 33*, 657-677.
- Cooper, M. D. & Phillips, R. A. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal of Safety Research, 35*, 497-512.
- Farrington, D. P. & Loeber, R. (2000). Some benefits of dichotomization in psychiatric and criminological research. *Criminal Behavior and Mental Health, 100*-122.
- Felson, R. B. (1992). "Kick'em when they're down": Explanations of the Relationship Between Stress and Interpersonal Aggression and Violence. *The Sociological Quarterly, 33*, 1-16.
- Fernandes, C. M., Raboud, J. M., Christenson, J. M., Bouthillette, F., Bullock, L., Ouellet, L. et al. (2002). The effect of an education program on violence in the emergency department. *Annals of Emergency Medicine, 47*-55.
- Gerberich, S. G., Nachreiner, N. M., Ryan, A. D., Church, T. R., McGovern, P. M., Geisser, M. S. et al. (2011). Violence against educators: A population-based study. *Journal of occupational and environmental medicine, 53*, 294-302.
- Gimeno, D., Barrientos-Gutierrez, T., Burau, K. D., & Felknor, S. A. (2012). Safety climate and verbal abuse among public hospital-based workers in Costa Rica. *Work: Journal of Prevention, Assessment & Rehabilitation, 42*, 29-38.

*Effects of Violence Prevention Behavior on Exposure to Workplace Violence and Threats: A Follow-up Study*

Gimeno, D., Felknor, S. A., Burau, K. D., Delclos, G. L., & Barrientos-Gutierrez, T. (2007). Association of occupation and safety practices with work-injury absence among public hospital employees in Latin America: a study from Costa Rica. *Injury Prevention, 13*, 264-269.

Guastello, S. J. (1993). Do we really know how well our occupational accident prevention programs work? *Safety Science, 16*, 445-463.

Hogh, A., Sharipova, M., & Borg, V. (2008). Incidence and recurrent work-related violence towards healthcare workers and subsequent health effects. A one-year follow-up study. *Scandinavian journal of public health, 36*, 706-712.

Hogh, A. & Viitasara, E. (2005). A systematic review of longitudinal studies of nonfatal workplace violence. *European journal of work and organizational psychology, 14*, 291-313.

Hussein, R. T. (1989). Informal groups, leadership and productivity. *Leadership & Organization Development Journal, 10*, 9-16.

Johnson, S. E. (2007). The predictive validity of safety climate. *Journal of Safety Research, 38*, 511-521.

Kessler, S. R., Spector, P. E., Chang, C., & Parr, A. D. (2008). Organizational violence and aggression: development of the three-factor violence climate survey. *Work and stress, 22*, 108-124.

Konda, S., Reichard, A. A., & Tiesman, H. M. (2012). Occupational injuries among U.S. correctional officers, 1999-2008. *Journal of Safety Research, 43*, 181-186.

Kristensen, T. S., Hannerz, H., Hogh, A., & Borg, V. (2005). The Copenhagen Psychosocial Questionnaire--A tool for the assessment and improvement of the psychosocial work environment. *Scandinavian Journal of Work, Environment & Health, 31*, 438-449.

*Effects of Violence Prevention Behavior on Exposure to Workplace Violence and Threats: A Follow-up Study*

- Lawoko, S., Soares, J. J. F., & Nolan, P. (2004). Violence towards psychiatric staff: a comparison of gender, job and environmental characteristics in England and Sweden. *Work and stress, 18*, 39-55.
- Leather, P., Lawrence, C., Beale, D., & Dickson, R. (1998). Exposure to occupational violence and the buffering effects of intra-organizational support. *Work and stress, 12*, 161-178.
- Leather, P. & Zarola, T. (2010). *Violence at work*. Wiley-Blackwell.
- Lipscomb, J. A., London, M., Chen, Y. M., Flannery, K., Watt, M., Geiger-Brown, J. et al. (2012). Safety climate and workplace violence prevention in state-run residential addiction treatment centers. *Work, 47*-56.
- Menckel, E. & Viitasara, E. (2002). Threats and violence in Swedish care and welfare - magnitude of the problem and impact on municipal personnel. *Scandinavian journal of caring science, 16*, 376-385.
- Nachreiner, N. M., Gerberich, S. G., McGovern, P. M., Church, T. R., Hansen, H. E., Geisser, M. S. et al. (2005). Relation between policies and work related assault: Minnesota nurses' study. *Occupational and Environmental Medicine, 67*5-681.
- Nachreiner, N. M., Gerberich, S. G., Ryan, A. D., Erkal, S., McGovern, P. M., Church, T. R. et al. (2012). Risk of physical assault against school educators with histories of occupational and other violence: A case-control study. *Work: Journal of Prevention, Assessment & Rehabilitation, 42*, 39-46.
- Naveh, E., Katz-Navon, T., & Stern, Z. (2005). Treatment Errors in Healthcare: A Safety Climate Approach. *Management Science, 51*, 948-960.
- Piquero, N. L., Piquero, A. R., Craig, J. M., & Clipper, S. J. (2013). Assessing research on workplace violence, 2000-2012. *Aggression and Violent Behavior, 383*-394.

*Effects of Violence Prevention Behavior on Exposure to Workplace Violence and Threats: A Follow-up Study*

- Rasmussen, C. A., Hogh, A., & Andersen, L. P. (2013). Threats and physical violence in the workplace: A comparative study of four areas of human service work. *Journal of interpersonal violence, 28*, 2749-2769.
- Schat, A. C. & Kelloway, E. K. (2003). Reducing the adverse consequences of workplace aggression and violence: the buffering effects of organizational support. *Journal of Occupational Health Psychology, 8*, 110-122.
- Schein, E. H. (2010). *Organizational Culture and Leadership*. (4th ed.) Jossey-Bass.
- Silva, S., Lima, M. L., & Baptista, C. (2004). OSCI: An organisational and safety climate inventory. *Safety Science, 42*, 205-220.
- Spector, P. E., Coulter, M. L., Stockwell, H. G., & Matz, M. W. (2007). Perceived violence climate: A new construct and its relationship to workplace physical violence and verbal aggression, and their potential consequences. *Work and stress, 21*, 117-130.
- Spector, P. E., Zhou, Z. E., & Che, X. X. (2014). Nurse exposure to physical and nonphysical violence, bullying, and sexual harassment: A quantitative review. *International Journal of Nursing Studies, 51*, 72-84.
- Tiesman, H., Konda, S., Hendricks, S., Mercer, D., & Amandus, H. (2013). Workplace violence among Pennsylvania education workers: Differences among occupations. *Journal of Safety Research, 65*-71.
- Tobin, T. J. (2001). Organizational determinants of violence in the workplace. *Aggression and Violent Behavior, 91*-102.

*Effects of Violence Prevention Behavior on Exposure to Workplace Violence and Threats: A Follow-up Study*

- Vegchel, N. V., Jonge, J. D., Söderfeldt, M., Dormann, C., & Schaufeli, W. (2004). Quantitative Versus Emotional Demands Among Swedish Human Service Employees: Moderating Effects of Job Control and Social Support. *International Journal of Stress Management, 11*, 21-40.
- Viitasara, E. & Menckel, E. (2002). Developing a framework for identifying individual and organizational risk factors for the prevention of violence in the health-care sector. *Work, 19*, 117-123.
- Wassel, J. T. (2009). Workplace violence intervention effectiveness: A systematic literature review. *Safety Science, 1049-1055*.
- Wilkinson, C. L. (1999). An evaluation of an educational program on the management of assaultive behaviors. *Journal of Gerontological Nursing, 6-11*.
- www.arbejdsmiljoviden.dk. (2013). Nul tolerance oeger voldsstatistik.  
<http://www.arbejdsmiljoviden.dk/Aktuelt/Nyheder/2013/05/17-Nul-tolerance-oeger-voldsstatistik>
- Yang, L. Q., Spector, P. E., Chang, C. H., Gallant-Roman, M., & Powell, J. (2012). Psychosocial precursors and physical consequences of workplace violence towards nurses: A longitudinal examination with naturally occurring groups in hospital settings. *International Journal of Nursing Studies, 49*, 1091-1102.
- Zohar, D. (1980). Safety Climate in Industrial Organizations: Theoretical and Applied Implications. *Journal of Applied Psychology, 65*, 96-102.
- Zohar, D. (2000). A Group-Level Model of Safety Climate: Testing the Effect of Group Climate on Microaccidents in Manufacturing Jobs. *Journal of Applied Psychology, 85*, 587-596.
- Zohar, D. (2010). Thirty years of safety climate research: Reflections and future directions. *Accident Analysis & Prevention, 1517-1522*.

*Effects of Violence Prevention Behavior on Exposure to Workplace Violence and Threats: A Follow-up Study*

Zohar, D. & Luria, G. (2003). The use of supervisory practices as leverage to improve safety behavior: A cross-level intervention model. *Journal of Safety Research, 34*, 567-577.

Zohar, D. & Luria, G. (2005). A multilevel Model of Safety Climate: Cross-Level Relationships Between Organization and Group-level Climates. *Journal of Applied Psychology, 90*, 616-628.

**Table 1** Violence prevention behaviors

<b>Top management</b>	Requires each manager to help improve violence-prevention in his-her department Invests a lot of time and money in violence-prevention training for workers Considers violence-prevention in decisions concerning staffing and intake of clients
<b>Supervisor</b>	Your supervisor encourages staff to report <i>physical</i> violence Your supervisor encourages staff to report <i>threats</i> Your supervisor takes reports of workplace violence seriously Your supervisor gives sufficient help and support after a violent or threatening incident
<b>Co-worker</b>	Among co-workers you are encouraged to report <i>physical</i> violence Among co-workers you are encouraged to report <i>threats</i> Your co-workers give sufficient help and support after a violent or threatening incident

Items were supplemented with a context-specific introduction using organizational terms for the relevant supervisor or top management.

Cronbach's alpha across sectors: 0.7-0.9 for top management, 0.8-0.9 for supervisor, and 0.8-0.9 for co-worker

**Table 2** Descriptive statistics for main study variables

	ELDERCARE	PSYCHIATRY	SPECIAL SCHOOLS	PRISON AND PROBATION SERVICES
Total N (follow-up study sample)	577	617	511	1311
Female [n (%)]	97.0	79.2	72.0	50.0
Age [Mean (SD)]	47 (10)	45 (11)	43 (9)	43 (10)
Seniority [Mean (SD)]	9 (9)	8 (8)	6 (5)	9 (8)
<i>Violence and threats of violence</i>				
Violence scale, follow-up [Mean (SD)]	2.7 (6.6)	6.1 (8.0)	13.7 (13.9)	0.9 (2.9)
Threat scale, follow-up [Mean (SD)]	4.9 (8.4)	14.9 (13.0)	15.8 (14.2)	7.5 (9.3)
High level, violence at follow-up* [n (%)]	108 (19.3)	128 (22.5)	113 (22.6)	210 (16.2)□
High level, violence at baseline* [n (%)]	117 (21.6)	118 (19.8)	115 (23.0)	194 (15.1)□
High level, threats at follow-up * [n (%)]	159 (28.3)	144 (24.0)	122 (24.4)	292 (22.5)
High level, threats at baseline* [n (%)]	126 (23.4)	144 (24.5)	97 (19.7)	274 (21.5)
<i>Violence-prevention behaviors</i>				
Top-management [Mean (SD)]	2.3 (1.2)	2.5 (0.9)	2.2 (1.0)	1.2 (1.2)
Supervisor [Mean (SD)]	3.3 (0.7)	3.3 (0.7)	3.1 (0.7)	3.3 (0.8)
Co-worker [Mean (SD)]	3.3 (0.8)	3.5 (0.7)	3.3 (0.7)	3.5 (0.7)

Data on gender, seniority, and education were retrieved from the baseline survey.

For analytical purposes the dependent variable was dichotomized. We used the 75<sup>th</sup> percentile split for these variables measured both at T1 and T2.

□ Due to low frequencies of physical violence in the prison and probation services the physical violence scale was dichotomized at yes-no, in contrast to the 75<sup>th</sup> percentile.

\* Due to missing values, the total N for each variable may deviate from the total N of the study population.



**Table 3** Logistic regression analyses of the association between prevention behaviors and exposure to physical violence and threats of violence

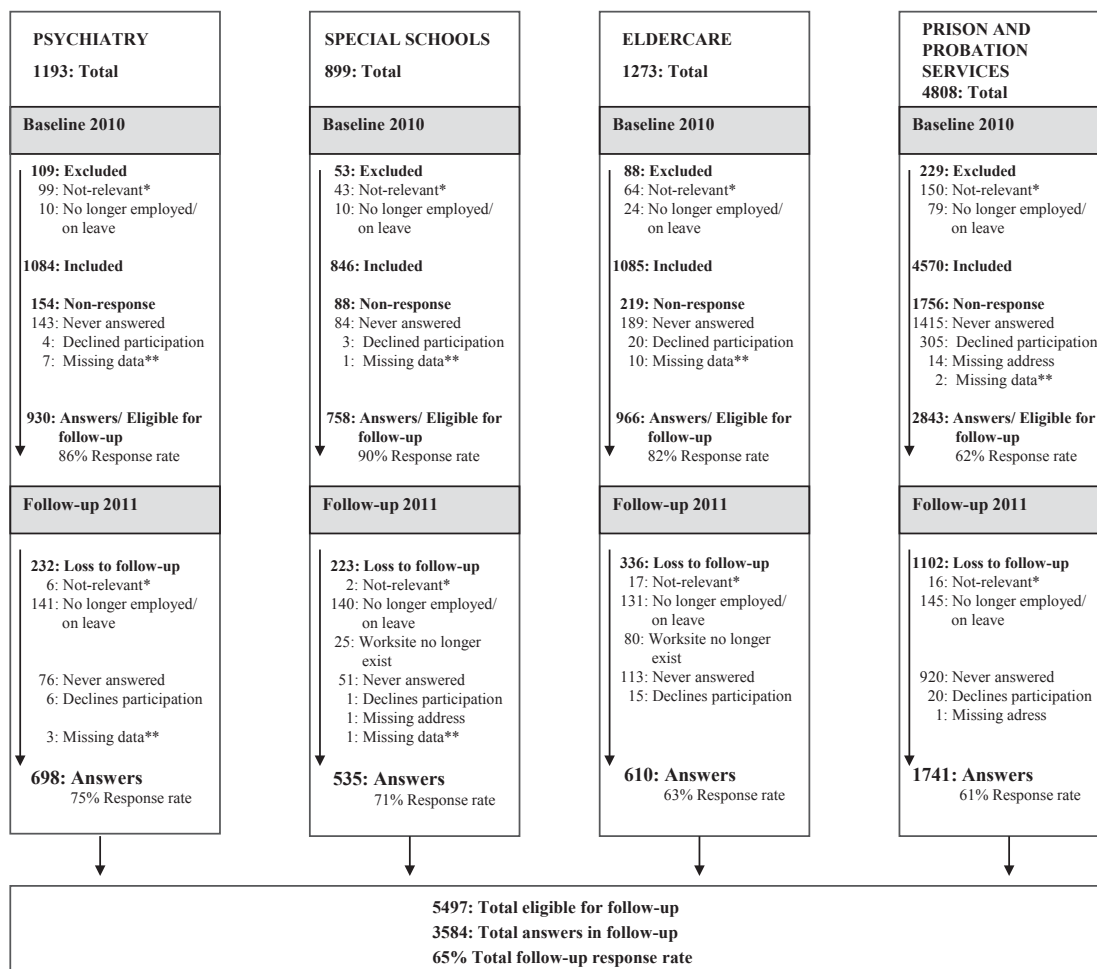
	PSYCHIATRY		SPECIAL SCHOOLS		PRISON AND PROBATION SERVICES <sup>1</sup>		ELDERCARE	
	OR	95 % CI	OR	95 % CI	OR	95 % CI	OR	95 % CI
<b>PHYSICAL VIOLENCE</b>								
	n = 413		n = 230		n = 708		n = 186	
Top management prevention behavior	<b>0.69</b>	<b>0.52 – 0.92</b>	1.01	0.71 – 1.44	0.90	0.74 – 1.10	0.94	0.91 – 1.03
Model $\chi^2$ (4)	83.37***		51.32***		159.37***		29.54***	
R <sup>2</sup> (Nagelkerke)	.27		.31		.33		.24	
	n = 525		n = 410		n = 1026		n = 390	
Supervisor prevention behavior	<b>0.52</b>	<b>0.30 – 0.89</b>	1.05	0.74 – 1.48	<b>0.78</b>	<b>0.63 – 0.98</b>	<b>0.53</b>	<b>0.35 – 0.80</b>
Model $\chi^2$ (4)	105.01***		64.70***		234.89***		71.60***	
R <sup>2</sup> (Nagelkerke)	.27		.22		.34		.32	
	n = 559		n = 468		n = 1136		n = 460	
Co-worker prevention behavior	<b>0.72</b>	<b>0.52 – 0.98</b>	1.00	0.72 – 1.39	<b>0.77</b>	<b>0.60 – 0.99</b>	<b>0.61</b>	<b>0.44 – 0.84</b>
Model $\chi^2$ (4)	112.53***		72.53***		239.67***		81.95***	
R <sup>2</sup> (Nagelkerke)	.27		.22		.32		.31	
<b>THREATS OF VIOLENCE</b>								
	n = 383		n = 230		n = 701		n = 189	
Top management prevention behavior	<b>0.58</b>	<b>0.43 – 0.80</b>	0.94	0.66 – 1.34	<b>0.81</b>	<b>0.67 – 0.98</b>	<b>0.75</b>	<b>0.57 – 0.996</b>
Model $\chi^2$ (4)	107.71***		63.09***		226.87***		44.29***	
R <sup>2</sup> (Nagelkerke)	.36		.35		.40		.28	
	n = 487		n = 404		n = 1013		n = 393	
Supervisor prevention behavior	1.30	0.91 – 1.86	1.10	0.76 – 1.59	<b>0.58</b>	<b>0.47 – 0.72</b>	<b>0.64</b>	<b>0.47 – 0.89</b>
Model $\chi^2$ (4)	112.15***		91.83***		345.03***		68.84***	
R <sup>2</sup> (Nagelkerke)	.31		.30		.43		.22	
	n = 519		n = 462		n = 1123		n = 466	
Co-worker prevention behavior	1.01	0.70 – 1.42	1.33	0.94 – 1.88	<b>0.62</b>	<b>0.49 – 0.78</b>	<b>0.68</b>	<b>0.53 – 0.87</b>
Model $\chi^2$ (4)	120.83.3***		99.58***		365.84***		85.00***	
R <sup>2</sup> (Nagelkerke)	.31		.29		.42		.22	

All analyses are adjusted for seniority, gender and baseline exposure.

\*p < .05, \*\* p < .01, \*\*\* p < .001

<sup>1</sup>Due to low frequencies of physical violence in the prison and probation services the violence scale was dichotomized at yes-no, in contrast to the 75<sup>th</sup> percentile

Figure 1. Flowchart of datacollection and sample



\*'Not-relevant' in this study was defined as: 1) Three weeks (or more) absence from work at time of survey distribution, 2) less than 3 week's employment (only baseline), and 3) no client contact.

\*\* Missing data: Respondent deleted due to less than 2% answered of total questionnaire.

## **PAPER III**

**A longitudinal study of the possible escalation of aggressive behaviors - from bullying and conflicts to workplace violence. Is emotional exhaustion a mediator?**

**SUBMITTED TO *JOURNAL OF OCCUPATIONAL AND ORGANIZATIONAL PSYCHOLOGY*  
2015**

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## **Abstract**

The aim of this longitudinal study was to explore the hypothesized escalatory pattern of aggressive behaviors by investigating whether bullying or conflicts progresses to threats of violence and physical violence. We explored whether conflicts and bullying were indirectly linked to threats and violence through the effect on strain (emotional exhaustion), which may make employees more vulnerable to future victimization. In addition, we explored the hypothesized progression of aggressive behaviors by analyzing threats as a mediator of the relationship between bullying or conflicts and physical violence.

Using a follow-up sample of 3.584 employees from four high risk work sectors, namely psychiatry, special schools, eldercare, and the prison and probation services, it was shown that conflicts, not bullying, at baseline were significantly related to higher exposure rates of threats and violence at follow-up. There were no mediation effects by emotional exhaustion; however, threats were a significant partial mediator of the relationship between conflicts and violence.

Conclusion: This study found that aggressive workplace behaviors do indeed escalate, particularly within a similar victim-perpetrator relationship, such as between employees and clients. The study highlights the need for de-escalation techniques that transcend specific encounters to include more long-term de-escalation, recognizing that aggressive behavior may escalate over time.

## **Introduction**

Workplace violence is widespread, costly and impacts employees within a variety of work sectors. Reviews have shown that exposure to workplace violence and threats is particularly high in service and human service sectors, such as healthcare, education, public safety, retail, and justice industries (Hogh & Viitasara, 2005; Piquero, Piquero, Craig, & Clipper, 2013; Spector, Zhou, & Che, 2014). Exposure rates as high as 66.9% for nonphysical violence and 36.4% for physical violence have been found for nurses (Spector et al., 2014), among special education teachers nearly 40% report verbal abuse (Tiesman, Konda, Hendricks, Mercer, & Amandus, 2013) and 50% report being kicked, while nearly one third of staff in eldercare are pinched or scratched (Rasmussen, Hogh, & Andersen, 2013).

The accumulating empirical literature is, however, characterized by a proliferation of conceptual and operational differences with regard to workplace violence and aggression (Barling, Dupré, & Kelloway, 2009; Piquero et al., 2013). Aggression is any form of behavior directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment (Baron, 1977), whereas workplace violence may be defined as “Incidents where staff are abused, threatened or assaulted in circumstances related work, including commuting to and from work, involving explicit or implicit challenges to their safety, well-being or health” (Wynne, Clarkin, Cox and Griffiths (1997, p.1)). Schat & Kelloway (2005) suggested that workplace violence should specifically refer to physical aggression (physical assaults or the threat of assault), while aggression is the more general term also encompassing a variety of interpersonal behaviors that may cause psychological harm (Barling et al., 2009; Schat & Kelloway, 2005). Accordingly, all violent behaviors are, by definition, aggressive whereas not all aggressive behaviors are violent. The current study applies the above definitions of workplace violence in that it must take place in relation to work, and refers to behaviors that explicitly or implicitly imply physical harm, i.e. threats

of violence and physical violence, while the general term of aggression refers to a variety of interpersonal behaviors that may cause psychological harm to someone who is motivated to avoid such treatment.

Distinguishing between types of aggressive workplace behaviors, such as bullying, harassment, or violence, is supported in light of studies that find distinct associations with prevalence estimates, antecedents and outcomes (e.g., Barling et al., 2009; Clausen, Høgh, & Borg, 2011; Clausen, Høgh, Carneiro, & Borg, 2013; Matthiesen & Einarsen, 2010; Menckel & Viitasara, 2002; Spector et al., 2014). Another important distinction regards the type of relationship in question, i.e. insider- or outsider initiated aggression. Within the literature on workplace violence most studies focus on violence toward employees by service-recipients, such as clients, inmates, customers, or patients (Piquero et al., 2013; Spector et al., 2014). These perpetrators account for more than 50% of non-physical and physical violence within Anglo and European regions (Spector et al., 2014). However, within some domains of aggressive behaviors, such as bullying, studies typically focus on co-worker or supervisor-subordinate relationships (e.g., Matthiesen & Einarsen, 2010).

The potential overlap between varieties of domains within aggressive behaviors may reflect an escalation of aggressive workplace behaviors. Escalation in this context does not refer to increased frequency of behavior, but reflects that behaviors will occur in an orderly fashion progressing from less to more intense aggressive behaviors (Andersson & Pearson, 1999; Dupré & Barling, 2006; Glomb, 2002). This could for example reflect a range of aggressive behaviors from being scolded or bullied to threats of assaults and further to physical assault. Baron and Neuman (1996) suggested that, in the workplace, physical violence is rarely a spontaneous act but more the culmination of escalating patterns of negative interaction between individuals. Limited research exists on the relationship between less and more intense aggressive behaviors at work. However,

Glomb (2002) studied employees at manufacturing companies and found evidence of an escalatory pattern to aggression, in which more severe behaviors were preceded by less severe behaviors within a particular incident. Dupre & Barling (2006) also studied potential escalation of aggression and found that psychological aggression toward supervisors was positively associated with physical acts of aggression directed toward supervisors. In addition, they found that psychological aggression partially mediated the relationship between interpersonal injustice and physical aggression, also supporting the notion of a progression of aggression from less serious to more extreme acts (Dupré & Barling, 2006). Lanza and colleagues (2006) found that health care workers who had experienced non-physical violence were 7.17 times more likely to also have experienced physical violence, which may imply escalation. However, these studies focus on specific incidents and/or use cross-sectional designs, which does not allow for conclusions regarding directionality. Moreover, they cannot account for possible escalation due to the accumulation of aggressive incidents over a period of time (Andersson & Pearson, 1999). This accumulation may be understood in terms of a “triggering mechanism” or “tipping point”, in that one incident after a series of aggravating encounters may cause an employee or client to lose motivation to maintain control over his or her actions. Thus, the tipping point prompts a more intense behavioral response, such as evolving from non-physical aggression to threats of assaults and further to physical assault (Andersson & Pearson, 1999; Schat & Kelloway, 2005). In sum, there is need for a longitudinal study testing the possible progression of aggressive behaviors and whether less intense aggression mediates more extreme aggressive (violent) behaviors.

Different theoretical frameworks may explain the emergence of aggressive workplace behaviors. According to the Frustration Aggression Theory (Berkowitz, 1989; Fox & Spector, 1999), tense and frustrated employees may show more aggressiveness and by venting negative emotions on co-workers, becoming a perpetrator or instigator of aggressive interactions. On the

other hand, frustrations may encourage workplace violence and threats through their indirect effect on the target, as suggested by the social-interactionist framework (Felson, 1992; Felson & Tedeschi, 1993). Feelings of frustration and being distressed may make it difficult to feign positive emotions and cause less competent work performance and violation of social norms, which others may consider provocative and thus react aggressively toward the distressed person. Punishing the perceived norm violation constitutes the first attack, which may be retaliated in order to deter future attacks, achieve justice and/or save face (Felson, 1992). Thus, the perception of and reaction to the primary punishment, and whether retaliatory reactions are initiated, may result in an escalatory cycle of aggressive behavior (Felson & Steadman, 1983). This interplay is particularly relevant for employees in the human service sectors, where clients or patients may have severe impulse problems due to a variety of diagnoses and/or history of violence. These clients may perceive minor negligence as norm violations and thus react with escalated aggressive behavior, which an employee may sanction in order to regain control and deter unwanted behaviour; however, this may instigate further counter-attacks.

These theoretical frameworks emphasize the mediating role of frustration and distress, making both causes and consequences of strain responses relevant for understanding escalating patterns of negative interactions. In the current work-related context, emotional exhaustion is particularly relevant as it is the dimension of burnout that most resembles job stress, reflecting a depletion of emotional and physical resources (Maslach, Schaufeli, & Leiter, 2001). This state of emotional exhaustion may lead to increased depersonalization, which often manifests itself as a withdrawal from work, not only emotionally distancing, but also physically distancing takes place (Maslach et al., 2001; Leiter, 1991). Although depersonalization conceptually should affect the quality of interpersonal relationships, meta-analysis has shown that exhaustion significantly reduces in-role behavior, organizational citizenship behavior, and customer satisfaction, while results on



depersonalization were inconclusive (Taris, 2006). However, Halbesleben and Rathert (2008) found a positive association between emotional exhaustion and depersonalization with the latter being associated with lower patient satisfaction and longer postdischarge recovery time. These results imply that emotional exhaustion may both have direct and indirect relationships with behavioral outcomes. As such, detecting emotional exhaustion may reflect an early stage in a possible escalating pattern of aggressive behaviors. Moreover, the relationship between emotional exhaustion and reduced customer satisfaction is evidence of possible link between employee strain and client frustration, thus implying conditions for aggression from organizational outsiders.

According to Leiter's model of burnout (Leiter, 1991; Leiter, 1989) workload and interpersonal conflicts are the most likely sources of burnout. Although Leiter (1991, 1989) relates interpersonal conflicts to working relationships, Winstanley and Whittington (2002) showed that aggression from patients contributes significantly to employee burnout. Thus, both aggressive encounters with co-workers and clients may contribute to burnout. In their study, Winstanley and Whittington (2002) also found that the most significant differences in burnout were related to being exposed to workplace aggression multiple times. As such, they argued that aggressive encounters can have a cumulative or additive effect upon levels of burnout, which will make employees more vulnerable to aggression from patients who are so predisposed. Subsequently, Winstanley and Whittington (2002) put forward a cyclical model in which interpersonal conflicts may both be a contributor and result of elevated levels of burnout. However, they could not test the circular relationships within their model due to their cross-sectional study design. Although this cyclical model focuses on the relationship between aggressive encounters and burnout, other sources of burnout such as workload and working conditions may equally contribute to more vulnerability to aggression through the effect of emotional exhaustion and depersonalization on behavior

(Winstanley & Whittington, 2002). Thus, the model postulates a general or non-specific increased vulnerability to aggression.

The notion of escalating aggressive workplace behaviors and the cyclical model of burnout and interpersonal aggression both entail a pattern of consecutive aggressive encounters. However, while the model of burnout implies a general risk of victimization – irrespective of the source of frustration, escalating workplace behaviors may be more target-specific. Studies on abusive supervisor-employee relationships have found that employees tend to respond with deviance behavior directed toward the source of perceived mistreatment (Inness, Barling, & Turner, 2005; Mitchell & Ambrose, 2007; Jones, 2009). Furthermore, studies show a positive correlation between the time the perpetrator and target spend together and workplace aggression (Dupré & Barling, 2006; Glomb, 2002), suggesting that long-term relationships with frequent contact, such as working relationships, are more prone to interpersonal conflicts. However, within some human service industries the relationship between employees and clients, patients, students, or inmates are long-term, stretching from weeks to months and even years of daily contact. Results from Lanza and colleagues (2006), showing associations between non-physical and physical violence from patients directed at staff, suggests that client relationships may also involve target-specific escalation. In addition, these researchers found that if the perpetrator of the most recent non-physical violence was a staff member, the perpetrator of the most recent physical violence was almost as likely to be a patient as a staff member (Lanza, Zeiss, & Rierdan, 2006). This result suggests a non-specific increased vulnerability to aggression, as aggression seemingly is displaced among unassociated targets (Berkowitz, 1989; Dollard, Doob, Miller, Mowrer, & Sears, 1939; Miller, 1984). Again, these results do not allow for conclusions regarding directionality, but they do suggest an association between being exposed to non-physical aggression by employees and exposure to physical aggression by clients.

### **Conflicts and bullying as antecedents of workplace violence and threats**

Both bullying and conflicts may be defined as an interaction between two individuals, an individual and a group or two groups in which at least one of the parties feels obstructed or irritated by the other (Baillien & De Witte, 2009; Matthiesen & Einarsen, 2010; van de Vliert, 1998). In terms of aggression, both bullying and conflicts represent interpersonal behaviors that may cause psychological harm to anyone who is motivated to avoid such treatment. Furthermore, both bullying and conflicts are defined in terms of a subjective experience, which does not necessarily have an objective basis (Matthiesen & Einarsen, 2010; van de Vliert, 1998). Although, bullying and conflicts share similar characteristics, there are also important distinctions. Workplace bullying, is by definition long-standing escalated behavior and refers to the outcome of a subsequent number of episodes in which negative acts become more frequent over time (Einarsen, Raknes, & Matthiesen, 1994). In contrast, conflicts may be more or less escalated and thus the magnitude of frustration will vary (van de Vliert, 1998). Moreover, conflicts may be short as well as rather long-standing, including a single episode (e.g., a quarrel regarding unclear procedures that are quickly clarified) or a series of episodes (e.g., a long-lasting debate between a patient and employees regarding no smoking rules) (Baillien & De Witte, 2009). Another important distinction is that workplace bullying involves stigmatization of one particular employee, the target, into an inferior position, which hampers the target's possibilities to counteract the bullying (Einarsen et al., 1994; Zapf & Gross, 2001). Conversely, unequal power is not a defining element of conflicts.

According to Buss (1961) aggressive behavior in general may be conceptualized along three dimensions: physical-verbal, active-passive, and direct-indirect. The aggressive content may vary across bullying cases and social conflicts, but the behaviors would more often be defined by verbal behavior, indirect and passive dimensions (Matthiesen & Einarsen, 2010). In sum, the current study regards both conflicts and bullying as non-physically aggressive behaviors, which

may constitute antecedents of even more extreme behaviors, such as threats of violence and physical violence.

### **Aim and hypotheses**

This study takes on the challenge raised by Barling et al (2009), who in their review encourage future research to examine whether verbal or psychological aggression can escalate into physical aggression. Thus, the current study aims to explore the hypothesized escalatory pattern of aggressive behaviors by investigating whether bullying or conflicts are antecedents of threats of violence and physical violence. Furthermore, this study aims to investigate the possible mediating role of emotional exhaustion, which may constitute a non-specific vulnerability to victimization. As such, we hypothesize that:

*Hypothesis 1:* Employees exposed to bullying or conflicts will report higher exposure rates of threats and violence at one-year follow-up

*Hypothesis 2:* The relationship between bullying or conflicts and exposure rates of threats and violence will be mediated by emotional exhaustion

*Hypothesis 2.1:* The relationship between bullying or conflicts and exposure rates of violence will be mediated by threats.

The findings will also be discussed with respect to non-specific and target-specific escalation of aggressive behaviors.

### **Method**

#### **Design and Participants**

In this study, we applied a longitudinal research design, as it is based on a prospective cohort study of employees within four areas of human services sectors: psychiatry, special schools, eldercare, and the prison and probation services. These work sectors were chosen due to a relatively high risk

of workplace threats and physical violence and that their service users, i.e. patients, elderly, inmates and special education students, all are likely to have a propensity to low impulse control due to various diagnoses and/or history of violence.

The baseline study, described in Rasmussen et al. (2013), consisted of 5497 employees from the above mentioned work sectors. Eligible for the follow-up study were those employees still at the same worksite, still in jobs with client contact and no more than three weeks absence at the time of survey distribution. Altogether, 3584 participated in the follow-up study with an overall follow-up response rate of 65% (See flowchart of the cohort in (Gadegaard, Høgh, & Andersen, 2015). The four work sectors were not equally represented in the total sample, with the prison and probation services (n=1741) representing close to 50% of the full sample, while the other three sectors were more similar in size, i.e. psychiatry (n=698), special schools (n=535), eldercare (n=610).

### **Data collection**

The baseline data collection took place in the period between May and October 2010 and the follow-up was conducted in the same period in 2011. At both rounds of data collection participants in the prison and probation services received a web-based questionnaire, while other participants received and filled out paper-and-pencil questionnaires during a planned meeting at the worksite. It was stated in the cover letter of the questionnaire that participation in the study was voluntary and that the data would be treated confidentially. In Denmark questionnaire surveys do not require approval by ethic committees. However, the study was approved by the Danish Data Protection Agency, and followed the regulations for data storage and protection. Respondents were identified by questionnaire numbers, which only members of the research group could link to civil registration

numbers. This procedure was to ensure accurate matching of questionnaires from the two rounds of data collection.

## Measures

### **Bullying and conflicts at work**

Bullying and conflicts were measured using items from the second version of the Copenhagen Psychosocial Questionnaire (COPSOQ-II) (Pejtersen, Kristensen, Borg, & Bolyard, 2010).

Respondents were given the following introduction to bullying: “Bullying means that a person repeatedly is exposed to unpleasant or degrading treatment and that the person finds it difficult to defend him or herself against it”. Subsequently, respondents were asked “Have you been exposed to bullying at your workplace during the last 12 months”? One item was used for conflicts and quarrels: “Have you been involved in quarrels or conflicts at your workplace during the last 12 months”? This formulation has a negative connotation such that it excludes those conflicts that may reflect a positive, although intense, social exchange. Response options were similar for both items: Yes, daily; Yes, weekly; Yes, monthly; Yes, a few times; No. Furthermore, respondents were asked:” If yes, with whom? (You may tick off more than one); Colleagues; Manager/supervisor; Subordinates; Clients/patients”. For the statistical analyses, exposure categories were collapsed into the following categories: (1) Frequently exposed (daily-weekly); (2) Occasionally exposed (monthly - a few times); and (3) Never exposed.

### **Emotional exhaustion**

COPSOQ-II (Pejtersen et al., 2010) also has a dimension referred to as burnout. We used three of the four items: “How often have you been physically exhausted”?; “How often have you been emotionally exhausted”?; “How often have you felt tired”? These items reflect a state of emotional exhaustion as opposed to the depersonalization component of burnout, and therefore we label this dimension as emotional exhaustion. Response options were: All the time; A large part of the time;

Part of the time; A small part of the time; Not at all. The scale was scored from 0-100. For all analyses, the scale was measured at baseline. Cronbach's alfa: 0.84.

### **Threats and physical violence**

Respondents were asked whether they had experienced the following acts of threatening behaviors at their current worksite within the past 12 months: threats of beatings, written threats, threats over the phone, threats involving objects, and indirect threats (toward family). Similarly, respondents were asked whether they had experienced the following acts of physically violent behaviors: spitting, hitting, hitting with an object, scratching/pinching, shoving, being held, punching with a fist, kicking, biting, having a hard object thrown at you, and use of a weapon or weapon like object (Menckel & Viitasara, 2002). Response categories were: (1) Yes, daily; (2) Yes, weekly; (3) Yes, monthly; (4) Yes, now and then; and (5) No, never. Using this as a continuous measure we saw problems with the statistical assumptions of normality and homoscedasticity, therefore the scale was dichotomized. For the statistical analyses, we chose to dichotomize at the 75<sup>th</sup> percentile recognizing that in these high risk work sectors, some exposure to violence or threats is widespread.

### **Control variables**

Reviews on workplace violence have shown that males are relatively more at risk, although this difference is larger for physical than non-physical forms of aggression (Hogh & Viitasara, 2005; Piquero et al., 2013). Results on whether age is a risk factor are inconsistent (Hogh & Viitasara, 2005), however, for the current analyses, we controlled for both gender and age, measured at baseline.

### **Data analyses**

One-way ANOVAs were preliminarily performed in order to explore the relationship between levels in emotional exhaustion according to either the frequency of bullying and conflicts or by who

are involved in these behaviors. The Games-Howell post hoc procedure was used due to unequal group sizes and different population variances.

The main analysis uses hierarchical logistic regression to compute odds ratios (OR) and 95% confidence intervals (95% CI). Statistical significance was judged by whether or not the 95% confidence interval included the value of 1.00. All analyses were adjusted for age and gender. The analysis consisted of three main steps. In step 1, conflicts and bullying were tested as antecedents of threats or violence (from clients). In step 2, we added our potential mediator, emotional exhaustion. In the analyses concerning conflicts and bullying as antecedents of violence, we also tested possible mediation effects of threats. These possible mediators were introduced in separate steps in order to explore their unique contribution. Mediation was judged by whether or not a significant association in step 1, became insignificant when adding the mediator in step 2 (or step 2.1). This would account for perfect mediation (Baron & Kenny, 1986). Partial mediation was judged by whether the odds ratio in step 1 decreased more than 10 % after entering the potential mediator variable (Rothman & Greenland, 1998). Finally, in step 3, we controlled for the dependent variable at T1, thus ruling out the influence of the dependent variable at T1 on increased levels of the dependent variable at T2. All statistical analyses were conducted using SPSS 21.

## Results

Of the 3584 respondents, 64.4% were female with an average age of 45; at baseline (T1) 60% reported being threatened and about 40 % reported being subject to physical violence (See Table 1). The group with high levels of threats at T1 (n = 826) was slightly larger than at T2 (n = 729). While groups with high levels of physical violence were more similar at T1 (n = 744) and T2 (n = 772). Approximately 85% at both T1 and T2 had never experienced being bullied, while the reverse was true for conflicts, such that at both T1 and T2 approx 80% had experienced conflicts.



These aggressive behaviours also differed concerning who were involved; about 70% of experiences of bullying were from other employees, while about 70% of experiences of conflicts were from clients (See Table 2). Both threats and physical violence were almost exclusively from clients. Thus, clients are involved in the majority of conflicts and incidents of workplace violence, indicating a similar victim-perpetrator relationship between these types of aggressive incidents. Bullying however, does not involve the same victim-perpetrator relationship as the other types of aggressive incidents, in that bullying most often involves other employees

Table 1 and 2 about here

Results of the ANOVA confirmed the expected relationship that higher frequencies of both bullying and conflicts were related to increased levels of emotional exhaustion (See Table 3). Further, the ANOVA showed that there were no significant differences in levels of emotional exhaustion according to who were involved in bullying, while for conflicts there were significantly lower levels of emotional exhaustion related to only clients than only employees or both employees and clients. However, the results also show that the mean levels of emotional exhaustion are similar for 'frequent conflicts' (37.90), 'employees' (37.13) and 'both employees and clients' (37.92). Also, "frequent bullying" showed by far the highest mean levels of emotional exhaustion (52.45) in comparison to the most taxing "by who" category, i.e. "Both employees and clients" (41.99). This indicates that using the "by who" measure would not capture the full range of emotional exhaustion. Thus, these results imply that frequencies of bullying and conflicts will be a good measure for experienced strain irrespective of who are involved.

Table 3 about here

Table 4 shows the results of longitudinal logistic analyses of the association between bullying and conflicts at baseline and likelihood of threats or violence at follow-up. Step 1, for

threats, shows that occasional and frequent conflicts were associated with significantly increased odds ratios for threats, while no associations were significant for bullying. Step 2, shows that associations were not mediated by emotional exhaustion; step 3, shows that the associations were still significant when adjusting for baseline levels of threats. For violence, step 1 shows that occasional and frequent conflicts were associated with significantly increased odds ratios for violence, while no associations were significant for bullying. Step 2, shows that these associations were not mediated by emotional exhaustion, while step 2.1 shows that threats was a significant mediator of the relationship between frequent conflicts and violence in that the association was reduced with more than 10%. Further, step 2.1 revealed an association between frequent bullying and significantly reduced odds ratios for violence. Step 3, shows that the associations were still significant when adjusting for baseline levels of violence.

Table 4 about here

## Discussion

The aim of this study was to explore whether non-physical aggression, defined as bullying or conflicts, are antecedents of threats and physical violence, while also testing for the potential mediating effect of emotional exhaustion. The results showed that conflicts at baseline were significantly related to higher self-reported exposure rates of threats and violence at follow-up, while this was not the case for bullying. Thus, partly giving support for hypotheses 1. Emotional exhaustion was not confirmed as a mediator of the relationship between neither bullying nor conflicts and threats and violence (rejecting hypothesis 2). However, threats partially mediated the relationship between conflicts and violence (partly supporting hypothesis 2.1). The latter result is consistent with the cross-sectional finding by Dupre & Barling (2006), who found that psychological aggression partially mediated the relationship between interpersonal injustice and physical aggression. Although their findings only included employee-supervisor interactions, the

current study has found a similar progression of aggressive behaviors in the relationship between employee(s) and client(s).

One possible explanation for the finding that bullying was not associated with higher levels of threats or violence may be that bullying primarily involved other employees. In contrast, conflicts in this study involved the same victim-perpetrator relationship as violence and threats. The associations between conflicts and threats/violence may therefore reflect a more closed circuit of interpersonal escalating and reciprocal behaviors. This implies that frustration from one source (bullying from employees) was not displaced against unassociated targets (clients). As such, this longitudinal study could not replicate the findings from the cross-sectional study by Lanza & colleagues (2006), which suggested an association between being exposed to non-physical aggression by employees and being exposed to physical aggression by clients. This may be explained by differences in measures and study populations. However, the current results did confirm that non-physical violence is a risk factor for physical violence in the client-employee relationship. In addition, the current findings show that there is an escalation effect, in that behaviors may progress from less to more extreme, i.e. from conflicts to threats and further to violence. The findings also show a dose-response relationship in that higher frequencies of conflicts are associated with higher odds ratios for threats and violence. This indicates a cumulative effect of aggressive behavior. These findings are in line with and expand existing evidence on escalating aggression (Dupré & Barling, 2006; Felson & Steadman, 1983; Glomb, 2002; Murphy & O'Leary, 1989).

The accumulation of aggressive incidents over time may involve specific challenges for employees in the human service sectors. A quotation from a study on nurses' interpretation of violence describes this professional dilemma (Åkerström, 2002):

When I first got here and encountered it [aggression] for the first thousand times, I felt sorry for them and really tried to keep calm. You wanted to see it as an illness. But we're not more than humans: After a while you too begin to say things like "No that wasn't nice, was it?" [In a stern voice] to those you think are not confused.

This quotation highlights both the accumulating and escalating dimensions, while also portraying the professional take on clients as ascribing aggressive behavior to illness. The latter would constitute a mitigating circumstance that may counteract the degree of frustration, negative affect and aggressive tendency (Berkowitz, 1989). However, as the above quote implies, this mitigating circumstance may be moderated by the accumulation of aggressive incidents. The one-year time-span of the present study suggests that this accumulation and escalation of incidents may persist over an extensive time frame.

Moreover, inherent in many human service and caring industries is the task of verbal or physical limit setting for clients, which according to both the Frustration Aggression Theory (Berkowitz, 1989; Fox & Spector, 1999) and the social interactionist framework (Felson, 1992; Felson & Tedeschi, 1993) may constitute an aversive event for the client, which he/she may react to with escalated aggression. Risk of assault has been associated with situations such as enforcing smoking rules, requesting patients to go to certain areas or not eat or drink certain foods, and also assisting with activities of daily living (ADL) (Bensley, Nelson, Kaufman, Silverstein, & Shields, 1995; Lanza & Kayne, 1995; Lanza, 1988). This suggests that irrespective of employee distress, these working situations may involve risk of conflicts and escalation to violence. Furthermore, although escalation pertains to reciprocal behaviors, in the client relationships there may not be equal responsibility for the exchange of behaviors. In contrast to co-worker relationships, the de-escalation of a conflict may rest more on one party of the exchange, namely the employee. Thus, irrespective of the instigation or cause of the conflict, employees may be required to competently

de-escalate the situation (Fauteux, 2010). However, results from the current study should be interpreted with caution, so as to not further assign responsibility of victimization on the victim but rather focus on the role of the workplace in preventing future aggression from clients. As such, workplaces may offer training in verbal and physical management of clients (Wassel, 2009). Moreover, worksites should have violence prevention policies and practices, where formal reporting of incidents are encouraged and taken seriously (Chang, Eatough, Spector, & Kessler, 2012; Kessler, Spector, Chang, & Parr, 2008; Spector, Coulter, Stockwell, & Matz, 2007; Yang, Spector, Chang, Gallant-Roman, & Powell, 2012). Also, victims of aggression should receive social support from supervisors and co-workers, thus alleviating strain responses (Schat & Kelloway, 2003; Leather, Lawrence, Beale, & Dickson, 1998). Thus, the current findings may be used by organizations to inform effective prevention by recognizing the accumulating and escalating nature of aggression in the client relationship.

As expected, this study found that experiences of bullying and conflicts were associated with increased levels of emotional exhaustion, although surprisingly, this did not explain the increased risk of threats or violence. With regard to conflicts, this lack of significant mediation may be due to insufficient levels of emotional exhaustion in order to influence behavior. In fact, the mean level for the emotional exhaustion scale was 32, while the most intense level for conflicts was about 37.9. In contrast, bullying experiences showed by far more taxing levels of emotional exhaustion. These differences in strain may be due to different opportunities to cope with the negative encounters. In a client-related interpersonal conflict, an employee may refer to a professional understanding of the client's problems (cognitive appraisal) (Chapman, Styles, Perry, & Combs, 2010), while also getting support from co-workers, thus buffering strain responses (Frese, 1999; Schat & Kelloway, 2003). In contrast, bullying experiences may obstruct sources of intra-organizational support and induce negative feelings of being ostracized, thus intensifying

strain responses (Matthiesen & Einarsen, 2010; Zapf & Gross, 2001). However, even rather high levels of emotional exhaustion related to bullying at baseline did not mediate the risk of threats or violence at follow-up. In contrast, the results may reflect that targets of bullying, although experiencing high strain, may have qualitatively different client relationships in comparison to employees involved in ongoing conflicts with clients. Targets of bullying from co-workers may appraise being with clients as their “safe-zone” in contrast to employees in ongoing conflicts with clients. Thus, it may be a relief to be in a position of somewhat power and control, as inherent in the client relationship, in contrast to being trapped in an inferior position in relation to colleagues and/or supervisors (Zapf & Gross, 2001). However, future studies should further explore the qualitative aspects of the caregiver-client relationship when an employee is bullied by co-workers.

Surprisingly, the current study found that frequent bullying was associated with significantly decreased risk of violence, after adjusting for threats and baseline violence. In terms of burnout, this may reflect an effect of depersonalization, i.e. distancing or withdrawal from work, both emotionally and physically (Maslach et al., 2001; Leiter, 1991). This could entail frequent or prolonged absenteeism from work (Clausen, Hogh, & Borg, 2012; Ortega, Christensen, Hogh, Rugulies, & Borg, 2011), declining certain tasks and/or declining to deal with certain aggressive clients. However, for the current study we did not include the measure of depersonalization since the translation of this dimension into Danish has proven problematic (Kristensen, Borritz, Villadsen, & Christensen, 2005); although, it is possible that emotional exhaustion at baseline evolved into depersonalization at follow-up (Maslach et al., 2001; Leiter, 1991). Furthermore, some evidence suggests that the combination of emotional exhaustion and depersonalization is related to less dominant behavior, which paradoxically may lead to less escalation in conflict situations (Euwema, Kop, & Bakker, 2004). Thus, this detached behavior may become an effective strategy by acting in a neutral, less dominant and less directive way, thereby preventing escalation and

ending a negative interaction. Another explanation may be that a supervisor is trying to protect and take care of a vulnerable employee by not requiring that employee to do tasks with more inherent risk of violence. In terms of the social-interactionist framework (Felson, 1992; Felson & Tedeschi, 1993) this withdrawal or favorable treatment may be considered a nuisance for co-workers, who may react with intensifying the bullying behavior. Thus, while this may entail less exposure to violence from clients, it may increase bullying behaviors from co-workers, thereby intertwining these domains of aggressive behavior. However, more research is needed to unravel issues regarding upward and downward spiraling across domains of aggressive behaviors.

The assumption of less and more severe (intense) aggressive behavior warrants a few comments. Studies have found that bullying as opposed to threats and (non-fatal) violence may have more severe consequences (Clausen et al., 2011; Clausen et al., 2013), however, for the current purposes the focus was on the possible escalation from non-physical aggression (bullying and conflicts) to violence. Therefore, in the current context, escalating severity does not refer to potential consequences, but only to the progression of behaviors from non-physical aggression to physical aggression, in which behaviors become more physical, active and direct (Buss, 1961).

### **Strengths and limitations**

A significant strength of the present study is the use of a longitudinal design with acceptable response rates (Flowchart described in Gadegaard et al, 2015). This reduces bias among measures and provides support for causal interpretations.

However, the study also has limitations. The fact that 50% of the participants were from the prison and probations services questions whether the associations are more relevant for this sector than the other three sectors. However, as this study investigates behaviors that are more individual-specific than context-specific, we believe that the associations are relevant for the entire

sample. Moreover, although our main predictors (bullying and conflicts) did not correlate substantially ( $r_s = .15, p < .01$ ), as we adjusted for baseline levels of the dependent variables, we checked and found correlations between threats and conflicts ( $r_s = .49, p < .01$ ). Although, this still leaves 50% of unique variance, it does entail some multicollinearity, in which some of the shared effect is subsumed in the stronger association. Furthermore, we examined the effect of stratifying as opposed to adjusting for baseline levels of the dependent measure. This did not change the overall results; however, in the case of occasional bullying we did find differences for high and low baseline exposure groups, but these results were still not significant. A further limitation is the use of dichotomizing measures, i.e. threats and violence, which means that we lose some information and therefore we are perhaps simplifying the relationships in question. However, dichotomizing also has some advantages in that measures, such as the odds ratio, often are more realistic and meaningful measures of strength of relationship than the product-moment correlation  $r$  (Farrington & Loeber, 2000). Furthermore, the optimal time span between baseline and follow-up in relation to workplace aggression is unknown. Studies on escalating negative behaviours have used cross-sectional aggregate measures (Dupré & Barling, 2006) or analyses of critical incidents (Glomb, 2002). While the analyses of specific encounters is valuable in understanding situated escalating behaviour, the assumption of the accumulation of negative encounters and tipping points warrants a longer timeframe. We chose a one year follow-up since this has been recommended in relation to psycho-social work environment and mental health (De Lange, Taris, Kompier, Houtman, & Bongers, 2004). Lastly, generalization from this sample to the human service industries in general should be cautioned due to the use of convenience sampling (Rasmussen, Høgh, & Andersen, 2013). Although, this type of convenience sampling is legitimate when investigating tendencies (Nielsen & Einarsen, 2008).



## Conclusion and implications

As far as we know, this is the first study using a longitudinal design showing that aggressive workplace behaviors may progress from non-physical aggression (conflicts) toward physical aggression (threats of violence and violence). Furthermore, this study suggests that there is some domain specificity with regard to aggressive behaviors, such that escalation of behaviors is more likely within the same circuit of interpersonal relationships. This is contrary to the notion that strain responses may mediate a general vulnerability to future victimization irrespective of the source of frustration.

These findings imply that when working in the human service industries, particularly with clients that may have low impulse control, it is essential to train de-escalating techniques including conflict management techniques for specific encounters, while recognizing that aggressive encounters escalate over a period of time, such that de-escalation also encompasses a series of encounters. The latter implies identifying problematic client-employee relationships and pro-actively, before the rise of a new conflict, practice non-aggressive communication in an effort to break a vicious pattern of escalating aggressive behavior.

## Reference List

- Åkerström, M. (2002). Slaps, punches, pinches - but not violence: Boundary-work in nursing homes for the elderly. *Symbolic interaction*, 25, 515-536.
- Andersson, L. M. & Pearson, C. M. (1999). Tit for tat? The spiraling effect of incivility in the workplace. *Academy of Management Review*, 24, 452-471.

- Baillien, E. & De Witte, H. (2009). The relationship between the occurrence of conflicts in the work unit, the conflict management styles in the work unit and workplace bullying. *Psychologica Belgica, 49*, 207-226.
- Barling, J., Dupré, K. E., & Kelloway, E. K. (2009). Predicting workplace aggression and violence. *Annual Review of Psychology, 60*, 671-692.
- Baron, M. R. & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Baron, R. A. (1977). *Human Aggression*. New York: Plenum Press.
- Baron, R. A. & Neuman, J. H. (1996). Workplace violence and workplace aggression: Evidence on their relative frequency and potential causes. *Aggressive Behavior, 22*, 161-173.
- Bensley, L., Nelson, N., Kaufman, J., Silverstein, B., & Shields, J. W. (1995). Patient and staff views of factors influencing assaults on psychiatric hospital employees. *Issues in mental health nursing, 16*, 433-446.
- Berkowitz, L. (1989). The frustration-aggression hypothesis: An examination and reformulation. *Psychological Bulletin, 59*-73.
- Buss, A. H. (1961). *The Psychology of Aggression*. New York: Wiley.
- Chang, C., Eatough, E. M., Spector, P. E., & Kessler, S. R. (2012). Violence-prevention climate, exposure to violence and aggression, and prevention behavior: A mediation model. *Journal of Organizational Behavior, 33*, 657-677.
- Chapman, R., Styles, I., Perry, L., & Combs, S. (2010). Nurses' experience of adjusting to workplace violence: A theory of adaptation. *International Journal of Mental Health Nursing, 19*, 186-194.

- Clausen, T., Høgh, A., Carneiro, I. G., & Borg, V. (2013). Does psychological well-being mediate the association between experiences of acts of offensive behaviour and turnover among care workers? A longitudinal analysis. *Journal of Advanced Nursing*, *69*, 1301-1313.
- Clausen, T., Høgh, A., & Borg, V. (2012). Acts of offensive behavior and risk of long-term sickness absence in the Danish elder-care services: a prospective analysis of register-based outcomes. *International archives of occupational and environmental health*, *85*, 381-387.
- De Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2004). The relationships between work characteristics and mental health: Examining normal, reversed and reciprocal relationships in a 4-wave study. *Work & Stress*, *18*, 149-166.
- Dollard, J., Doob, N., Miller, N. E., Mowrer, O. H., & Sears, R. R. (1939). *Frustration and Aggression*. New Haven: Yale University Press.
- Dupré, K. E. & Barling, J. (2006). Predicting and Preventing Supervisory Workplace aggression. *Journal of Occupational Health Psychology*, *11*, 13-26.
- Einarsen, S., Raknes, B. I., & Matthiesen, S. B. (1994). Bullying and Harassment at Work and Their Relationships to Work Environment Quality: An Exploratory Study. *The European Work and Organizational Psychologist*, *4*, 381-401.
- Euwema, M. C., Kop, N., & Bakker, A. B. (2004). The behaviour of police officers in conflict situations: how burnout and reduced dominance contribute to better outcomes. *Work and stress*, *18*, 23-38.
- Farrington, D. P. & Loeber, R. (2000). Some benefits of dichotomization in psychiatric and criminological research. *Criminal Behavior and Mental Health*, 100-122.

- Fauteux, K. (2010). De-Escalating Angry and Violent Clients. *American Journal of Psychotherapy*, 64, 195-213.
- Felson, R. B. (1992). "Kick'em when they're down": Explanations of the Relationship Between Stress and Interpersonal Aggression and Violence. *The Sociological Quarterly*, 33, 1-16.
- Felson, R. B. & Tedeschi, J. T. (1993). *Social interactionist perspectives on aggression and violence: An introduction*. Washington, DC, US: American Psychological Association.
- Felson, R. B. & Steadman, H. J. (1983). Situational factors in disputes leading to criminal violence. *Criminology: An Interdisciplinary Journal*, 21, 59-74.
- Fox, S. & Spector, P. E. (1999). A model of work frustration-aggression. *Journal of Organizational Behavior*, 915-931.
- Frese, M. (1999). Social support as a moderator of the relationship between work stressors and psychological dysfunctioning: A longitudinal study with objective measures. *Journal of Occupational Health Psychology*, 4, 179-192.
- Gadegaard, C. A., Høgh, A., & Andersen, L. P. (2015). Effects of Violence Prevention Behavior on Exposure to Workplace Violence and Threats: A Follow-up Study. *Journal of interpersonal violence*, submitted.
- Glomb, T. M. (2002). Workplace Anger and Aggression: Informing Conceptual Models with data from specific encounters. *Journal of Occupational Health Psychology*, 7, 20-36.
- Halbesleben, J. R. B. & Rathert, C. (2008). Linking physician burnout and patient outcomes: Exploring the dyadic relationship between physicians and patients. *Health Care Management Review*, 33, 29-39.

- Hogh, A. & Viitasara, E. (2005). A systematic review of longitudinal studies of nonfatal workplace violence. *European journal of work and organizational psychology, 14*, 291-313.
- Inness, M., Barling, J., & Turner, N. (2005). Understanding Supervisor-Targeted Aggression: A Within-Person, Between-Jobs Design. *Journal of Applied Psychology, 90*, 731-739.
- Jones, D. A. (2009). Getting even with one's supervisor and one's organization: Relationships among types of injustice, desires for revenge, and counterproductive work behaviors. *Journal of Organizational Behavior, 30*, 525-542.
- Kessler, S. R., Spector, P. E., Chang, C., & Parr, A. D. (2008). Organizational violence and aggression: development of the three-factor violence climate survey. *Work and stress, 22*, 108-124.
- Kristensen, T. S., Borritz, M., Villadsen, E., & Christensen, K. B. (2005). The Copenhagen Burnout Inventory: A New Tool for the Assessment of Burnout. *Work & Stress, 19*, 192-207.
- Lanza, M., Zeiss, R., & Rierdan, J. (2006). Non-Physical Violence. A Risk Factor for Physical Violence in Health Care Settings. *American Association of Occupational Health Nursing Journal, 397-402*.
- Lanza, M. L. (1988). Factors relevant to patient assault. *Issues in mental health nursing, 9*, 239-257.
- Lanza, M. L. & Kayne, H. L. (1995). Patient assault: A comparison of patient and staff perceptions. *Issues in mental health nursing, 16*, 129-141.
- Leather, P., Lawrence, C., Beale, D., & Dickson, R. (1998). Exposure to occupational violence and the buffering effects of intra-organizational support. *Work and stress, 12*, 161-178.
- Leiter, M. P. (1989). Conceptual Implications of Two Models of Burnout. A Response To Golembiewski. *Group & Organization Management, 14*, 15-22.

- Leiter, M. P. (1991). Coping patterns as predictors of burnout: The function of control and escapist coping patterns. *Journal of Organizational Behavior (1986-1998)*, 12, 123.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397-422.
- Matthiesen, S. B. & Einarsen, S. (2010). Bullying in the workplace: Definition, prevalence, antecedents and consequences. *International Journal of Organization Theory and Behavior*, 13, 202-248.
- Menckel, E. & Viitasara, E. (2002). Threats and violence in Swedish care and welfare - magnitude of the problem and impact on municipal personnel. *Scandinavian journal of caring science*, 16, 376-385.
- Miller, N. E. (1984). Theory and experiment relating psychoanalytic displacement to stimulus-response generalization. *Journal of Abnormal and Social Psychology*, 155-178.
- Mitchell, M. S. & Ambrose, M. L. (2007). Abusive supervision and workplace deviance and the moderating effects of negative reciprocity beliefs. *Journal of Applied Psychology*, 92, 1159-1168.
- Murphy, C. M. & O'Leary, K. D. (1989). Psychological aggression predicts physical aggression in early marriage. *Journal of Consulting and Clinical Psychology*, 57, 579-582.
- Nielsen, M. B. & Einarsen, S. (2008). Sampling in research on interpersonal aggression. *Aggressive Behavior*, 34, 265-272.
- Ortega, A., Christensen, K. B., Høgh, A., Rugulies, R., & Borg, V. (2011). One-year prospective study on the effect of workplace bullying on long-term sickness absence. *Journal of Nursing Management*, 19, 752-759.
- Pejtersen, J. H., Kristensen, T. S., Borg, V., & Bolyard, R. (2010). The second version of the Copenhagen Psychosocial Questionnaire. *Scandinavian journal of public health*, 38, 8-24.

- Piquero, N. L., Piquero, A. R., Craig, J. M., & Clipper, S. J. (2013). Assessing research on workplace violence, 2000-2012. *Aggression and Violent Behavior, 383-394*.
- Rasmussen, C. A., Hogh, A., & Andersen, L. P. (2013). Threats and physical violence in the workplace: A comparative study of four areas of human service work. *Journal of interpersonal violence, 28, 2749-2769*.
- Rothman, K. & Greenland, S. (1998). *Modern Epidemiology*. (2 ed.) Lippincott-Raven.
- Schat, A. C. & Kelloway, E. K. (2003). Reducing the adverse consequences of workplace aggression and violence: the buffering effects of organizational support. *Journal of Occupational Health Psychology, 8, 110-122*.
- Schat, A. C. H. & Kelloway, E. K. (2005). Workplace Aggression. In J. Barling, E. K. Kelloway, & M. Frone (Eds.), *Handbook of Work Stress* (pp. 189-218). Thousand Oaks, CA: Sage.
- Spector, P. E., Coulter, M. L., Stockwell, H. G., & Matz, M. W. (2007). Perceived violence climate: A new construct and its relationship to workplace physical violence and verbal aggression, and their potential consequences. *Work and stress, 21, 117-130*.
- Spector, P. E., Zhou, Z. E., & Che, X. X. (2014). Nurse exposure to physical and nonphysical violence, bullying, and sexual harassment: A quantitative review. *International Journal of Nursing Studies, 51, 72-84*.
- Taris, T. W. (2006). Is there a relationship between burnout and objective performance? A critical review of 16 studies. *Work & Stress, 20, 316-334*.

- Tiesman, H., Konda, S., Hendricks, S., Mercer, D., & Amandus, H. (2013). Workplace violence among Pennsylvania education workers: Differences among occupations. *Journal of Safety Research*, 65-71.
- van de Vliert, E. (1998). Conflict and Conflict Management. In P.J.D.Drenth, H. Thierry, & C. J. de Wolff (Eds.), *Handbook of Work and Organizational Psychology* (pp. 351-376). East Sussex: Psychology Press.
- Wassel, J. T. (2009). Workplace violence intervention effectiveness: A systematic literature review. *Safety Science*, 1049-1055.
- Winstanley, S. & Whittington, R. (2002). Anxiety, burnout and coping styles in general hospital staff exposed to workplace aggression: A cyclical model of burnout and vulnerability to aggression. *Work & Stress*, 16, 302-315.
- Yang, L. Q., Spector, P. E., Chang, C. H., Gallant-Roman, M., & Powell, J. (2012). Psychosocial precursors and physical consequences of workplace violence towards nurses: A longitudinal examination with naturally occurring groups in hospital settings. *International Journal of Nursing Studies*, 49, 1091-1102.
- Zapf, D. & Gross, C. (2001). Conflict escalation and coping with workplace bullying: A replication and extension. *European journal of work and organizational psychology*, 10, 497-522.



**Table 1.** Descriptive statistics for main study variables (follow-up study sample, N = 3584)

	Baseline 2010 (T1)	Follow-up 2011 (T2)
Female [n (%)]	2313 (64.6)	-
Age [Mean (SD)]	45 (10)	-
Bullying [n (%)]		
Never	2949 (84.8)	-
Occasional	475 (13.7)	-
Frequent	52 (1.5)	-
Conflicts [n (%)]		
Never	710 (20.3)	-
Occasional	2127 (60.9)	-
Frequent	655 (18.3)	-
Emotional exhaustion [Mean (SD)]	32 (21)	-
Threats, high exposure levels [n (%)]	826 (26.1)	856 (24.4)
Violence, high exposure levels [n (%)]	744 (21.5)	772 (22.1)

For analytical purposes the dependent variable was dichotomized and when controlling for baseline levels, we matched the categories of the variables measured both at T1 and T2.

**Table 2.** Perpetrators of bullying, conflicts, threats and physical violence [n (%)]

	Clients	Employee(s)	Both employee(s) and clients
Bullying T1	61 (12.0)	354 (69.7)	93 (18.3)
Bullying T2	35 (6.6)	394 (74.1)	103 (19.4)
Conflicts T1	1852 (70.1)	229 (6.4)	562 (21.3)
Conflicts T2	1845 (68.8)	11 (0.4)	826 (30.8)
Threats T1	2197 (97.0)	16 (0.7)	51 (2.3)
Threats T2	2150 (96.5)	21 (0.9)	57 (2.6)
Physical violence T1	1355 (99.4)	0	8 (0.6)
Physical violence T2	1227 (99.4)	3 (0.2)	4 (0.3)

The above categories of clients and employees are mutually exclusive, such that if both employees and clients were ticked by the respondent then they would only be categorized as “both employee(s) and clients”. “Employees” refers to colleagues, manager/supervisor and subordinates.

**Table 3.** One-way ANOVAs of differences in levels of emotional exhaustion according to frequency of conflicts and bullying or according to by who are involved in these negative behaviours:

		Frequency	n	Mean	SD	F	df
Conflicts	0	Never <sup>1,2</sup>	709	26.61	18.65		
	1	Occasional <sup>0,2</sup>	2027	32.41	20.28	54.71***	2
	2	Frequent <sup>0,1</sup>	678	37.90	21.79		
Bullying	0	Never <sup>1,2</sup>	2917	30.70	19.97		
	1	Occasional <sup>0,2</sup>	469	38.97	21.06	59.71***	2
	2	Frequent <sup>0,1</sup>	51	52.45	23.71		
		By whom	n	Mean	SD	F	df
Conflicts	0	Clients <sup>1,2</sup>	1824	32.30	20.43		
	1	Employee(s) <sup>0</sup>	224	37.13	23.43	18.53***	2
	2	Both employee(s) and clients <sup>0</sup>	555	37.92	20.65		
Bullying	0	Clients	61	39.34	24.63		
	1	Employee(s)	349	40.21	21.85	0.33	2
	2	Both employee(s) and clients	91	41.99	19.61		

Numbers 0-1 indicate for the frequency: 0 = Never, 1= Occasional, and 3=Frequent

Numbers 0-1 indicate for by whom: 0 = Clients, 1= Employee(s), and 3= Both employee(s) and clients

Superscript numbers indicate significant differences by the Games-Howell post hoc test

All variables are measured at baseline

**Table 4.** Bullying and conflicts as antecedents of threats and physical violence. Results of longitudinal logistic regression analyses

	Threats (N = 3175)						Physical violence (N = 3135)					
	Step 1		Step 2		Step 3		Step 1		Step 2		Step 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Bullying												
Never	Ref	-	Ref	-	Ref	-	Ref	-	Ref	-	Ref	-
Occasionally	1.23	0.97-1.56	1.17	0.92-1.49	1.16	0.88-1.53	0.88	0.68-1.14	0.85	0.66-1.12	0.78	0.60-1.06
Frequent	1.23	0.65-2.33	1.04	0.55-1.99	0.76	0.37-1.59	0.53	0.25-1.12	0.47	0.22-1.01	<b>0.34</b>	<b>0.15-0.76</b>
Conflicts												
Never	Ref	-	Ref	-	Ref	-	Ref	-	Ref	-	Ref	-
Occasionally	<b>5.57</b>	<b>3.77-8.23</b>	<b>5.39</b>	<b>3.64-7.97</b>	<b>3.14</b>	<b>2.09-4.73</b>	<b>3.72</b>	<b>2.62-5.26</b>	<b>3.63</b>	<b>2.56-5.14</b>	<b>2.28</b>	<b>1.58-3.28</b>
Frequent	<b>18.96</b>	<b>12.61-28.52</b>	<b>17.97</b>	<b>11.93-27.06</b>	<b>4.98</b>	<b>3.19-7.76</b>	<b>16.41</b>	<b>11.36-23.70</b>	<b>15.76</b>	<b>10.89-22.80</b>	<b>5.44</b>	<b>3.65-8.11</b>
Emotional exhaustion <sup>a</sup>												
Threats T1 <sup>b</sup>												
Low												
High												
Threats T1/Violence T1 <sup>c</sup>												
Low												
High												
Step $\chi^2$ (df)	469.37	(6)	***	10.43	(1)	**	425.74	(6)	***	4.40	(1)	**
R <sup>2</sup> (Nagelkerke)	.20			.21			.19			.20		

All analyses are adjusted for age and gender.

\*p < .05, \*\* p < .01, \*\*\* p < .001

<sup>a</sup>Testing emotional exhaustion as a mediator of the relationship between bullying or conflicts and both threats and violence

<sup>b</sup>Testing baseline threats as a mediator of the relationship between bullying or conflicts and physical violence

<sup>c</sup>Adjusting for baseline levels of the dependent variable



# **APPENDIX**

## Overview of type of profession in each sector

### Tables A - D

**Table A. Professions in the prison and probation services.**

	Responders at baseline (N:2843)	Responders at baseline and follow-up (N:1741)
Correctional officers	517 (46.9)	748 (43.0)
Other personnel in uniform	427 (15.1)	301 (17.5)
Correctional officers and other personnel in uniform, students	250 (8.7)	117 (6.7)
Social worker	304 (10.7)	194 (11.1)
Social worker, trainees	6 (0.2)	-
Social educator	52 (1.8)	33 (1.9)
Teacher	64 (2.3)	37 (2.1)
Health personnel	68 (2.4)	36 (2.1)
Consultants	21 (0.7)	18 (1.0)
Management	222 (7.8)	164 (9.4)
Administration	36 (3.3)	62 (3.6)
Kitchen, cleaning, service personnel	21 (0.7)	11 (0.6)
Other	45 (1.5)	20 (1.2)

**Table B. Professions in psychiatry.**

	Responders at baseline (N:930)*	Responders at baseline and follow-up (N:698)*
Nurse	276 (30.8)	198 (28.4)
Doctors	26 (2.9)	15 (2.2)
Care workers, assistants	276 (30.8)	220 (32.7)
Care workers, other training	58 (6.5)	45 (6.7)
Psychologist /psychiatrist	33 (3.7)	21 (3.1)
Social educator	62 (6.9)	46 (6.8)
Social worker	18 (2.0)	14 (2.1)
Physical and occupational therapists	28 (3.1)	19 (2.8)
Administration	34 (3.8)	28 (4.2)
Management	61 (6.8)	53 (7.9)
Other	23 (2.6)	14 (2.1)

Note \* Due to missing values, the total N for each variable may deviate from the total N of the study population

**Table C. Professions in special schools**

	Responders at baseline (N:758)*	Responders at baseline and follow-up (N:535)*
Teacher	329 (44.6)	244 (46.7)
Social educator	275 (37.3)	199 (38.1)
Social educator, assistants	78 (10.6)	41 (7.9)
Psychologists	7 (0.9)	4 (0.8)
Physical and occupational therapists	6 (0.8)	5 (1.0)
Management	21 (2.8)	15 (2.9)
Other	21 (2.9)	14 (2.7)

Note \* Due to missing values, the total N for each variable may deviate from the total N of the study population

**Table D. Professions in elder care**

	Responders at baseline (N:966)*	Responders at baseline and follow-up (N:610)*
Nurse	66 (7.4)	33 (5.8)
Care workers, assistants	178 (19.9)	124 (21.8)
Care workers, helpers	396 (44.3)	250 (44.0)
Care workers, other training	103 (11.5)	75 (13.2)
Home care workers	20 (2.2)	13 (2.3)
Physical and occupational therapists	43 (4.8)	37 (6.5)
Kitchen, cleaning	13 (1.5)	5 (0.9)
Management	36 (4.0)	21 (3.7)
No formal training	22 (2.5)	3 (0.5)
Other	16 (1.8)	7 (1.2)

Note \* Due to missing values, the total N for each variable may deviate from the total N of the study population

## Supplementary analyses. Tables E-I

In tables E-I, the outcome measures, violence and threats, were split accordingly: 0= No violence, 1-75th quartile = Moderate level, and above the 75th quartile = High level. However, seeing that differences in the percentages are of main interest, different cut-points were explored. For example, using the 75th quartile based on the entire sample on the individual sectors; while this did change the cumulative frequency it did not change the relative difference between non-responders and responders.

**Table E. Descriptive analyses of non-response at baseline in the prison and probation services. Background data on non-responders and responders at baseline**

	Non-responders at baseline (N:1965)	Responders at baseline (N:2843)
Age [Mean (SD)]	44 (11)	43 (10)
Female [n (%)]	862 (43.9)	1313 (46.2)
Correctional officers [n (%)]	754 (41.1)	1265 (44.6)
Surveillance (subgroup of other personnel in uniform)	<b>158 (8.6)</b>	<b>2 (0.1)</b>
Other personnel in uniform [n (%)]	239 (18.5)	434 (15.1)
Correctional officers and other personnel in uniform, students [n (%)]	129 (7.0)	243 (8.6)
Social worker [n (%)]	130 (7.1)	310 (10.9)
Social educator [n (%)]	20 (1.1)	52 (1.8)
Teacher [n (%)]	43 (2.3)	64 (2.3)
Health personnel [n (%)]	77 (4.2)	68 (2.4)
Consultants [n (%)]	9 (0.5)	21 (0.7)
Management [n (%)]	57 (3.1)	222 (7.8)
Administration [n (%)]	71 (3.9)	98 (3.4)
Kitchen, cleaning, service personnel [n (%)]	66 (3.6)	21 (0.7)
Other [n (%)]	82 (4.5)	39 (1.4)

To identify significant differences an a priori criterion was set at 5 %, thus differences between non-responders and responders >5% would signify a potential bias.



**Table F. Descriptive analyses of dropout in the total sample. Baseline characteristics for non-responders and responders at follow-up**

	Non-responders at follow-up (N:1913)	Responders at baseline and follow-up (N:3584)
Age [Mean (SD)]	42 (11)	45 (10)
Female [n (%)]	1221 (63.9)	2313 (64.6)
Seniority[Mean (SD)]	7 (8)	9 (8)
No threats [n (%)]	674 (37.1)	1252 (36.5)
Moderat level threats [n (%)]*	750 (41.3)	1348 (39.3)
High level of threats [n (%)]*	391 (21.5)	826 (24.1)
No violence [n (%)]	1162 (64.2)	2137 (61.8)
Moderat level violence [n (%)]*	243 (13.4)	441 (12.8)
High level of violence [n (%)]*	406 (22.4)	878 (25.4)

\* The 75<sup>th</sup> quartile was used to determine the upper limit, thus high levels indicate exposure above this cut-point. To identify significant differences an a priori criteria was set at 5 %, thus differences between non-responders and responders >5% would signify a potential bias.

**Table G. Descriptive analyses of dropout in elder care. Baseline characteristics for non-responders and responders at follow-up**

	Non-responders at follow-up (N:356)	Responders at baseline and follow-up (N:610)
Age [Mean (SD)]	44 (12)	48 (10)
Female [n (%)]	341 (96.3)	588 (96.9)
Seniority[Mean (SD)]	7 (8)	9 (9)
No threats [n (%)]	160 (48.2)	281 (49.6)
Moderat level threats [n (%)]*	128 (38.6)	224 (39.6)
High level of threats [n (%)]*	44 (13.3)	61 (10.8)
No violence [n (%)]	194 (57.9)	323 (56.8)
Moderat level violence [n (%)]*	52 (15.5)	99 (17.4)
High level of violence [n (%)]*	89 (26.6)	147 (25.8)

\* The 75<sup>th</sup> quartile was used to determine the upper limit, thus high levels indicate exposure above this cut-point. To identify significant differences an a priori criteria was set at 5 %, thus differences between non-responders and responders >5% would signify a potential bias.

**Table F. Descriptive analyses of dropout in psychiatry. Baseline characteristics for non-responders and responders at follow-up**

	Non-responders at follow-up (N:232)	Responders at baseline and follow-up (N:698)
Age [Mean (SD)]	43 (11)	45 (11)
Female [n (%)]	197 (84.9)	554 (79.5)
Seniority[Mean (SD)]	6 (7)	8 (9)
No threats [n (%)]	39 (17.0)	117 (17.7)
Moderat level threats [n (%)]*	109 (47.6)	285 (43.1)
High level of threats [n (%)]*	81 (35.4)	260 (39.3)
No violence [n (%)]	92 (40.5)	260 (38.7)
Moderat level violence [n (%)]*	42 (18.5)	146 (21.7)
High level of violence [n (%)]*	93 (41.0)	266 (39.6)

\* The 75<sup>th</sup> quartile was used to determine the upper limit, thus high levels indicate exposure above this cut-point. To identify significant differences an a priori criteria was set at 5 %, thus differences between non-responders and responders >5% would signify a potential bias.

**Table H. Descriptive analyses of dropout in special schools . Baseline characteristics for non-responders and responders at follow-up**

	Non-responders at follow-up (N:223)	Responders at baseline and follow-up (N:535)
Age [Mean (SD)]	38 (11)	43 (9)
Female [n (%)]	161 (72.5)	380 (71.2)
Seniority[Mean (SD)]	4 (6)	6 (5)
No threats [n (%)]	45 (20.8)	96 (18.6)
Moderat level threats [n (%)]*	70 (32.9)	176 (34.1)
High level of threats [n (%)]*	100 (46.3)	244 (47.3)
No violence [n (%)]	42 (19.4)	103 (19.8)
Moderat level violence [n (%)]*	28 (12.9)	48 (9.2)
High level of violence [n (%)]*	147 (67.7)	370 (71.0)

\* The 75<sup>th</sup> quartile was used to determine the upper limit, thus high levels indicate exposure above this cut-point. To identify significant differences an a priori criterion was set at 5 %, thus differences between non-responders and responders >5% would signify a potential bias.

**Table I. Descriptive analyses of dropout in the prison and probation services. Baseline characteristics for non-responders and responders at follow-up**

	Non-responders at follow-up (N:1102)	Responders at baseline and follow-up (N:1741)
Age [Mean (SD)]	41 (10)	44 (10)
Female [n (%)]	522 (47.4)	791 (45.4)
Seniority[Mean (SD)]	8 (8)	10 (9)
No threats [n (%)]	430 (41.4)	758 (45.1)
Moderat level threats [n (%)]*	442 (42.6)	663 (39.4)
High level of threats [n (%)]*	166 (16.0)	261 (15.5)
No violence [n (%)]	<b>834 (80.8)</b>	<b>1451 (85.7)</b>
Moderat level violence [n (%)]*	121 (11.7)	148 (8.7)
High level of violence [n (%)]*	77 (7.5)	95 (5.6)

\* The 75<sup>th</sup> quartile was used to determine the upper limit, thus high levels indicate exposure above this cut-point. To identify significant differences an a priori criterion was set at 5 %, thus differences between non-responders and responders >5% would signify a potential bias.

