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Ticket Inspectors in Action: Body-Worn Camera Analysis of Aggressive and Non-aggressive Passenger Encounters

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Abstract

Objective: Workplace aggression is a harmful occupational hazard, which has been associated with individual and organizational level risk factors. By comparison, little is known about the face-to-face interactional dynamics that shape employee victimizations. To address this gap, we provide an interactional analysis of how ticket inspector actions are associated with the risk of passenger aggression. Method: Data was a video sample of 123 ticket fining events from public buses recorded by occupational body-worn cameras. We systematically coded the inspector and passenger actions in each fining event. The individual and interactional risk factors associated with passenger aggression were estimated with a logistic regression model. Results: Our empirical analysis suggests that aggressive fining events unfold as "character contests," in which the actions of the inspectors are associated with the aggressive outcome. Conclusions: These findings are in line with situational approaches to violence highlighting that aggressive incidents often develop as an interplay between victim and offender actions. We propose focusing on the behavioral actions of employees for prevention measures of workplace aggression.

Keywords: Workplace aggression, public transport, character contest, conflict management, law enforcement

Introduction

Workplace aggression is a known risk for employees working with citizens (Chappell & Di Martino, 2006; Geoffrion et al., 2017; Piquero, Piquero, Craig, & Clipper, 2013). Highlighting this issue, four percent of European employees report having been exposed to physical violence by a citizen within the last year, with verbal victimizations being even more prevalent (LeBlanc & Kelloway, 2002; Milczarek, 2010). Public employees identified to be at risk include healthcare workers (Landau & Bendalak, 2010), police officers (Rabe-Hemp & Schuck, 2007), social workers (Ringstad, 2005), correctional officers (Konda, Reichard, & Tiesman, 2012), bus drivers and ticket inspectors (Assunção & Medeiros, 2015; Geoffrion et al., 2017; Piquero et al., 2013). The known health and well-being consequences for victimized public employees (for a review, see Lanctôt & Guay, 2014) emphasize the need to investigate the dynamics of workplace aggression in order to inform preventive strategies.

The existing occupational victimization literature has identified a range of individual and organizational explanations of work-life aggression. For example, studies find a positive association between occupational victimization and the previous criminal and addiction records of the perpetrators involved (Chappell & Di Martino, 2006; Hogh & Viitasara, 2005). Further, analyses at the organizational level show a relationship between high pressure work environments and increased incidents of threats and violence (Andersen, Hogh, Biering, & Gadegaard, 2018; Sharipova, Hogh, & Borg, 2010). By comparison, few studies have examined how victimizations may be shaped by the face-to-face interaction patterns between the employees and citizens (van Reemst, 2016). Among the key exceptions, Landau and Bendalak (2010) examined the factors related to staff victimizations in hospital emergency wards and showed a positive association between the inability to communicate effectively with patients and the likelihood of serious aggression towards staff. Also emphasizing the importance of communication, Rabe-Hemp and Schuck (2007) found a lower likelihood of police staff victimizations in cases where the officers initiated contact with citizens when first arriving to the scene. Studies of interactions between bar room staff and patrons similarly indicated the importance of behavioral actions of staff for prevention of aggression (Graham & Homel, 2012). These studies emphasize the value of examining employee victimizations at the situational level, although it should be noted that the existing research rarely provides detailed insights into the interactional dynamics of how employee actions *within* the conflict may shape the likelihood of citizen aggression. As such, the work-life victimization literature mirrors the wider field of research on aggression and violence, in which situational studies of interpersonal aggression are much less common than examinations of the individual or institutional background conditions (Bowman, Whitehead, & Raymond, 2018; Collins, 2008).

To address this research gap, the current article takes its point of departure in situational approaches that focus on the interactional dynamics of aggression (Block, 1981; Collins, 2008; Felson & Steadman, 1983; Luckenbill, 1977). What initially warrants such a perspective is the simple observation that even those individuals with the highest propensity for aggression (e.g., low self-control) only behave aggressively in very few and specific interactions (Collins, 2008; Felson & Steadman, 1983). Following the key insight that people tend to act aggressively as a reaction to dynamics of specific face-to-face interactions, we argue that we need to focus our attention to the interactional patterns of action and reaction to explain why some events end in aggression while others do not. Thus in the current study, we examine the potential interactional predictors of citizen aggression towards ticket inspectors

during ticket fining events. Here, ticket fining events are understood as the face-to-face encounters between a ticket inspector, who announces that a fine will be issued to a passenger, and the passenger who has failed to display a valid ticket. With each fining event as our unit of analysis, we focus on how the actions of an inspector, prior to the onset of any aggression, may be associated with aggressive passenger responses.

To this end, we draw on theory from symbolic interactionism suggesting that aggression often arises from "character contests" by which a conflict party loses face in an encounter with an experience of being shamed or insulted by the counterpart and then acts aggressively in order to defend or regain respect or a sense of self-confidence (Goffman, 1967; Luckenbill, 1977). This assertion has previously been applied as an explanation of homicides (Luckenbill, 1977), dispute-related assaults (Deibert & Miethe, 2003), bar room conflicts (Wells, Graham, & Tremblay, 2009), and everyday disagreements (Malone, 1994), but is rarely considered as a framework for interpreting victimizations in the workplace. One exception is Suquet (2019), who describes ticket fare evasion as a negotiation about whether the event should be defined as "deviant." The legitimacy of the issued fine may, for example, be contested by the passenger, and such face-to-face negation about moral fairness is a hallmark of character contests.

Several key observations across the existing literature on violent character contests may be relevant to the study of aggressive ticket fining events. Importantly, character contests may be more common in public than in private places, given that reputation management is more salient in the presence of an audience (Luckenbill, 1977). Further, some, albeit not all studies (Deibert & Miethe, 2003), suggest that men and younger persons are more likely to engage in character contests (Katz, 1988; Polk, 1994). Victim behavior may also play a key role during character contests, as these encounters involve a collision of wills whereby the prospective victim may or may not submit to the counterpart's status claim (Luckenbill, 1977). These risk factors concerning character contests and aggression are all present in the current analysis. Specifically, the bus setting of the ticket fining event is a populated public place, where an audience witnesses the interaction, and where we focus attention to how the actions of the employee may shape the risk of passenger aggression. As part of this analysis, we take passenger age and gender into account.

A main reason why few studies have examined the interactional features of work-life victimizations is that it is methodologically challenging to study real-life, mid-event aggression. This relates to the circumstance that the standard social scientific methods—including self-reported accounts (interviews, surveys) and ethnographic observations—rarely

capture the sequential micro-details of how aggressive interactions actually unfold (Morrison, Lee, Gruenewald, & Mair, 2016). As such, we follow the recent methodological recommendation to examine on-going aggressive encounters using on-site video recorded data (Collins, 2008; Lindegaard & Bernasco, 2018; Philpot, Liebst, Møller, Lindegaard, & Levine, 2019).

Specifically, we draw on a sample of 123 clips recorded by occupational body-worn cameras. Body-worn camera footage is unique because it both captures the physical and verbal communication of the events. Adding to this, video data allows—because the clips can be slowed down to frame-by-frame instances and observed repeatedly—for a very fine-grained and reliable behavioral coding of participant interaction (Philpot et al., 2019). To our knowledge, the current study is one of the first to utilize this video technology to study interpersonal aggression (see also Willits & Makin, 2017).

Utilizing the methodological benefits of video data, we developed an "ethogram" or behavioral inventory of the event-specific inspector and passenger behaviors performed during the fining events. This approach, which is inspired by animal ethology and subsequently adopted by human ethologists (Jones et al., 2016), recommends that scholars initially conduct systematic naturalistic observations of the behaviors of interest, and then develop an inventory that is used for quantification. The high resolution of this coding enables a micro-detailed analysis of the action-sequences in ticket fining events associated with aggressive and non-aggressive outcomes. As such, the current analysis offers unique insights into the interaction processes shaping occupational victimization. This information may be used to improve existing conflict training programs for transport personnel and a wider range of other public employees.

We outline our empirical expectations, which are based on the character contest theory (Goffman, 1967). In this framework, an inspector's defensive usage of authority may challenge the passenger's self-legitimacy, and thus escalate the interaction into aggression. Given that the fining events between the ticket inspectors and the passengers take place face-to-face, the interactions in the current study contain both verbal and physical actions (see Goffman, 1967). Following this verbal-physical distinction, we first expect that verbal authority actions by which an inspector voices his or her authority to the passenger are positively associated with passenger aggression (Hypothesis 1).

Likewise, the inspector's use of physical dominance may also challenge the passenger's self-legitimacy and incite aggression. Therefore, we further expect that physically dominating inspector actions are positively associated with passenger aggression (Hypothesis 2). Besides "a defensive orientation toward saving his own face" the inspector may

also adopt "a protective orientation toward saving the others' face" (Goffman, 1967, p. 14). We thus finally expect that accommodating actions—by which the inspector attempts to help the passenger save face—are negatively associated with passenger aggression (Hypothesis 3).

Methods

Pilot Procedure

In order to familiarize with the work tasks and the occupational experiences of the ticket inspectors prior to data collection, the first and last author attended three staff meetings and conducted on-site participant observations of several bus patrols. Furthermore, we conducted a short survey with the inspectors that evaluated which passenger actions were perceived as most offensive. During the on-site participant observations, the first and last authors accompanied a total of five teams of ticket inspectors for approximately three hours each. These observations provided important insights into the behaviors exhibited during ticket inspections, which informed the development of the subsequent coding procedure.

Ticket inspectors are evaluated by their managers based on the number of fines they issue, which creates an incentive to issue fines. The ticket inspectors work seven and a half hour shifts, usually in teams of two. During a shift, each inspector issues on average eight fines. They usually start the inspection from each end of the bus, one inspector works from the front of the vehicle and the other from the back. Upon entrance, they register the start time of the bus inspection, and typically announce their arrival to the passengers by saying out loud "Ticket inspection." They approach each passenger by asking "May I see your ticket?" Passengers have different ticket options: a subscription that offers unlimited travel; a travel card that one can charge up beforehand and scan upon entering the bus; an electronic ticket that one can buy via their cell phone before entering the bus; and a traditional paper ticket purchased from the bus driver when entering the bus. When the ticket is invalid, the inspector typically declares that "Your ticket is invalid." or "Your ticket is bought too late."

The time spent with the ticket inspectors enabled us to build up a level of trust and rapport with the employees. This period played a crucial role in allaying the confidentiality concerns of the employees, many of whom were initially reluctant to record videos for the current project due to fear that their managers may watch the recordings. This highlights a potential sample bias in the current data, while illustrating a wider discussion on sample biases for video data that is not collected directly by researchers (Lindegaard & Bernasco, 2018).

Main Study Procedure and Participants

Data was a sample of body-worn camera footage, recorded by 19 ticket inspectors during ticket patrols of public buses, in the center and suburbs of Copenhagen, Denmark, 2018. All body-worn cameras were carried as a security precaution, enabling the inspectors to document victimizations for criminal proceedings. For the current study, inspectors were instructed to switch on their cameras whenever they encountered a passenger that did not have a valid ticket. On a monthly basis, the first author visited the ticket inspectors at work and reminded them to record fining events for the project. This also provided an opportunity to discuss potential concerns or experiences. We obtained 374 recordings, typically containing one but sometimes none or several ticket fining events. The duration of the clips varied from less than one minute to approximately one and a half hours (typically because the inspector forgot to turn off their camera). Some ticket fining events were recorded simultaneously by the body-worn camera of multiple ticket inspectors[1].

From the 374 recordings, we selected videos that conformed to the following inclusion criteria: (1) Clips containing a ticket fining occurrence in which an inspector announces the decision to issue a fine to a passenger—independent of whether the passenger is eventually fined. (2) Clips of a technical quality (e.g., camera angle, resolution, audio) that allowed for a behavioral coding of interactions. (3) Clips capturing the duration of the inspector-passenger encounter, with none or only negligible breaks (see Nassauer & Legewie, 2018). If a video clip contained more than one ticket fining occurrence, we selected the first ticket fining in order to ensure independence of observations. The final sample comprised of 123 ticket fining events, each involving a face-to-face interaction between at least one inspector and one passenger without a valid ticket.

We originally planned that our sample size should have sufficient statistical power to find effects of a small magnitude (odds ratio ~ 1.75, Rosenthal, 1996). This required a sample size of around 250 events, including a "buffer" for data attrition. In practice, data contained more missing values than expected. As such, we accepted that the current sample size only makes it possible to detect effect sizes greater than small, hence increasing the risk of overlooking actual effects (i.e., false negative error).

[1] Recordings of overlapping event were during the initial screening collapsed and is thus only registered as one recording in the sample.

Coding Procedure. Coding began by observing the video clips and identifying all the occurrences in which an inspector declares they will fine a passenger. All selected data was coded by the first author in accordance with a detailed codebook of variable definitions (see online Supplementary Materials, Table S1 at osf.io/z8kfh). The behavioral inventory of the codebook was derived from the preliminary fieldwork with the ticket inspectors, in-depth qualitative assessments of a subset of data (Lorenz, 1973), prior research (Gacki-Smith et al., 2009), and from theoretical assumptions (Hall, Coats, & LeBeau, 2005; Kemper, 2011). Data was coded using BORIS, an open source software for video-based behavioral coding.

Coding began by identifying whether the passenger being fined (or a co-passenger) acted aggressively (see 'Measures' section for operationalization of aggression). On occasions where passenger aggression occurred, we recorded the presence or absence of certain inspector acts *prior* to the *first* passenger aggression. This approach ensured that the inspector actions carried out post-aggression would not be used to assess the very onset of aggression. In cases with no passenger aggression, we coded the presence or absence of the same inspector acts across the entire fining event.

One challenge was to determine whether inspector acts should be treated as 'non-occurring' *or* 'missing' in videos where the beginning of the interaction sequence was not captured in order not to reduce sample size (see Philpot et al., 2019). We decided to treat the act of calling the police in non-aggressive cases as 'non-occurring' under the assumption that the police would only be called in aggressive cases. We made this assumption based on our comparative assessment of other non-aggressive cases that involved optimal capture of the event, as it is common practice in video analysis (Nassauer & Legewie, 2018). Other inspector acts were treated as 'missing' in cases of incomplete interaction sequence (see Stephens, 2011).

Measures. ***Dependent variable.*** Our dependent variable captures actions of *passenger aggression*. Passenger aggression distinguishes whether a passenger performs at least one aggressive behavior towards a ticket inspector. To encompass all offensive passenger acts that may be deemed normatively "deviant" (see Alexandrova & Haybron, 2016), from the lowest to the highest level, we apply a broad definition of aggression. This definition comprises of both verbal and physical offensive acts. Verbal passenger acts include dictating the interaction (e.g. "You are not allowed do that"); swearing at the inspector; yelling or raising one's voice; indirect threats (e.g., "Give me your name"); direct threats (e.g., "This will have conse-

quences"). Non-verbal, physical passenger acts include threating gestures (e.g., face pointing); forceful body displays; pushing past or through; face-to-face personal space encroachment; touching of inspector (e.g., poking), photographing/filming the inspector[2]; and harmful/violent acts.

Independent variables. We include three binary independent variables, capturing different inspector actions. *Authority* acts are those by which the inspector shows assertiveness towards the passenger (e.g. "Sit down"), directly places the responsibility on the passenger ("You should have thought of that before getting on the bus"), or mentions or calls the police. *Physical dominance* encompasses acts by which an inspector confines the space of the passenger by physically blocking the movements of the passenger, by holding onto the passenger, or by announcing to the bus driver that the bus should stop or that the doors should remain closed (i.e., to prevent the passenger from leaving). *Accommodation* encompasses inspector acts that show sympathy with the passenger (e.g., "I know this is frustrating") or that displace the responsibility away from the ongoing encounter (e.g. "You can complain to the bus company," "I'm just doing my job").

Control variables. Finally, we include two model controls that measure the individual characteristics of the passenger. *Age* is a binary variable, distinguishing whether the passenger is 16 years or older or 15 years or younger (reference category). Note, that 16 years or older was determined as the 'adult age' as this is the age at which Danish public transport issues full fines, without a children's discount. *Gender* is a binary variable with woman as the reference category. Both gender and age were assessed from the video, which is reliable procedure in video analysis (Liebst, Philpot, et al., 2019; Lindegaard et al., 2017). Note that we include inspector gender as a specification in an alternative model in the sensitivity analysis.

Estimation

Data was estimated with a logistic regression model, using Stata 15's "logit" module. One issue in specifying this model is that the data has a hierarchical structure, given that the fining event cases are nested within the inspectors. Such data clustering may violate the regression assumption of independency of observations, thus likely resulting in deflated *p*-values and an increased false-positive error rate. To account for this, we specified our model with cluster-corrected standard errors (Cameron & Miller, 2015).

[2] This action was included because the inspectors themselves indicated that being filmed by a passenger was the most uncomfortable offense.

In evaluating our regression model, we present the estimated results with both traditional *p*-values and Bayes factors (Wagenmakers, 2007). This reflects that the application of Bayes factors may lead to fewer false positive findings than *p*-values (García & Puga, 2018; Goodman, 2008), and allows for the assessment of evidence in favor of non-associations (Dienes, 2014). Further, we perform a sensitivity analysis to evaluate how robust or fragile the estimated results are across a range of other plausible data and model specifications (Steegen, Tuerlinckx, Gelman, & Vanpaemel, 2016). As Leamer (1985, p. 308) highlights, a "fragile inference is not worth taking seriously," and the sensitivity analysis allows us to establish the extent to which our conclusions hinge on partially arbitrary specification choices. Alternative specifications included, but were not limited to, additional regression models that introduced inspector gender and simplified bivariate chi-squared tests (see Supplementary Materials at osf.io/z8kfh).

Results

Characteristics of the Ticket Fining Events

When riding on a public bus in Denmark without a valid ticket, passengers risk a substantial fine of 750 Danish Kroner (approximately 100 Euros). The fine for people under the age of 16 is half the adult fine (375 Danish Kroner). Around 90,000 people per year receive a fine when riding on a bus in the center and suburbs of Copenhagen.[3]

Table 1. Descriptive statistics of ticket fining event measures

Variable	Frequency	Percent
Passenger aggression		
Yes	16	13%
No	107	87%
*Inspector actions**		
Authority	27	22%
Physical dominance	23	19%
Accommodation	57	46%
Passenger gender		
Female	45	37%
Male	78	63%

[3] These figures have been provided from the traffic company that operates the public buses in Copenhagen and surrounding suburbs.

Passenger age		
15≤	6	5%
16≥	117	95%

Note: N = 123. *Does not sum to 100% since more actions per event were possible.

Inspector Actions

In 22 percent of the fining events, inspectors acted with authority actions such as communicating with decisiveness, mentioning the police, or emphasizing the passenger's responsibility with statements such as "You know this ticket is no longer valid." In 19 percent of the incidents, the inspector acted physically dominating by confining the passenger's space, blocking their movements, or by holding on to them (see Supplementary Materials, Table S1 at osf.io/z8kfh). Both authority and physical actions may be ways for the inspector to defend the authority and respect in the contested interaction. Note that the inspectors in many cases employed multiple actions. In 46 percent of the fining events, ticket inspectors acted with accommodating actions like showing sympathy by saying "I understand it is frustrating" or suggesting that the passenger contact the bus company for complaints—all attempts to find common ground and save face of the passenger in the ticket fining event.

Passenger Responses

Of the 123 fining events analyzed, 16 incidents (13 percent) involved a passenger displaying aggression towards an inspector. The aggressive responses of passengers varied in intensity over the course of the event. In six of the aggressive fining events, the first aggressive response of the passenger was to speak to the inspector in a dictating way or to curse at them. In five of the events, passengers raised their voice or yelled at the inspector. In the remaining five aggressive fining events, the passenger touched the inspector, tried to film them with their cell phone, or tried to avoid the inspectors by pushing their way through. In two events, these passenger responses escalated to physical violence against the inspector. In one case the passenger hit and kicked several inspectors and in another case the passenger pushed a single inspector hard on the upper body.

12 of the aggressive incidents (75 percent) involved fining events in which the passenger could not present a valid ticket upon inspection. In the remaining four other aggressive incidents (25 percent), the passenger had bought an electronic ticket too late. In this type of fining event, a passenger would typically buy the electronic ticket the moment that the inspector entered the bus, which made it invalid according to the rules stipulating that the

ticket must be purchased before travel. In the eyes of the passengers, being fined for such a ticket was often perceived as unfair, because they had paid for the ticket, albeit too late. As a consequence, electronic tickets provided the opportunity for passengers to negotiate the ambiguity of the rules and the fairness of the issued fine—as sequential steps towards escalation of the unfolding character contest. The below example (case 1) illustrates a ticket fining event with character contest and with space for negotiating the rules. Note that the quantitative action codes applied are highlighted in the text.

CASE 1:

A passenger sits at a window seat at the back of the bus and shows his phone with the electronic ticket to the inspector. The inspector checks the registered arrival time on her device after reviewing the ticket.

Passenger: "I just got onboard."

The inspector consults her colleague regarding the ticket purchase time.

Colleague: "It is bought much later **#ticket bought too late#**. It is a whole minute after."

Passenger: "I just got onboard."

The passenger then further explains why he did not buy it earlier.

Inspector: "The problem is that you bought it a whole minute after I entered the bus, as far as I can see. You can tell by looking at your time and my time." *The inspector shows the passenger the time difference on her device.*

Passenger: "The ticket just took a moment to register on the phone."

He holds the phone up towards her.

Inspector: "You cannot enter the bus without first receiving it [the electronic ticket].

Passenger: "I pressed and accepted right when I entered the bus, so…"

Inspector: "Yes, but it says unfortunately **#accommodation#**… Do you have some ID?"

Passenger: "For what reason?"

Inspector: "Because the ticket was bought after my arrival."

Passenger: [Sighs] "I haven't, because I entered when I pressed… [Smiling disarmingly]"

Inspector: "No, the only thing I can see is that the system says that you have **#accommodation#**. I am sorry **#accommodation#**." *Once again she tells him the time difference.*

Passenger: "It is like five seconds, right?"

Inspector: "One minute."

Passenger: "Well. Okay." *He then says irritated.*

Inspector: "Do you have some ID I can borrow?"

Passenger: “I think this is stupid” *the passenger says while finding some ID for the inspector, now accepting that he is being issued a fine.*

Associations Between Inspector Actions and Passenger Responses

The way that the ticket inspectors communicated to the passenger that the ticket was invalid, significantly predicted the risk of aggressive passenger responses. Table 2 presents our estimated logistic results. As expected, we find that authority inspector actions are statistically positively associated with passenger aggression at a 5-percent level of significance (Hypothesis 1). The estimated odds ratio suggests that passenger aggression is approximately seven times more likely in cases where authority actions are used, although the wide confidence interval indicates that the magnitude of this effect could range from small to very large. However, the related Bayes factor suggests that authority actions are only 2.6 times more likely to be associated with the aggressive outcome than non-associated—this should be considered weak evidence in favor of the estimated association (Wagenmakers et al., 2017).

Table 2. Results of logistic regression of passenger aggression towards ticket inspectors.

Variables	OR	*p*	95% CI	BF_{10}
Authority	6.32	.003	[1.91, 20.93]	2.56
Physical dominance	7.54	.016	[1.45, 39.24]	7.42
Accommodation	0.14	.033	[0.02, 0.86]	4.51
Male passenger	1.96	.349	[0.48, 8.08]	0.14

Note. N = 123 events nested across 19 ticket inspectors (Min = 1; Max = 13; Average = 6.5). $\chi^2(4) = 17.06$, $p = .002$. pseudo-$R^2 = .29$. OR = Odds ratio. CI = Confidence interval. BF_{10} = Bayes factor of H_1 over H_0. Passenger age was omitted from the model because of complete separation.

Next, we find the expected positive association between physical dominance actions and passenger aggression (Hypothesis 2), with the Bayes factor offering substantial support for this relationship. The odds ratio suggests that passenger aggression is approximately eight times more likely in cases where physical dominance is used, although the width of confidence interval leaves the magnitude of the effect uncertain. The positive associations between authority and physical dominance and the passenger aggressive outcome are illustrated in case 2.

CASE 2:

Two inspectors are standing in the middle section of the bus when new passengers enter. A man who is speaking on his phone enters a door towards the rear of the bus. The passenger appears to briefly turn and glance before walking hastily towards the front of the bus, briskly passing one of the inspectors.

Inspector: "Hello, we need to have a look at your ticket."

The passenger removes the phone from his ear.

Inspector: "Ticket inspection."

Passenger: "I need to get out, I am on the wrong bus."

Inspector: "I still need to see your ticket."

Passenger: "This is not my bus."

Inspector: "That does not matter. You are on a bus. Therefore you need to have a ticket."

Passenger: "I am on the phone. I cannot see what bus number it is [referring to the route]."

Inspector: "Can you keep the back doors closed **#physical dominance#**?" *The inspector asks his colleague.*

The passenger now starts walking to the front of the bus and the inspector follows.

Inspector: "I need to see your ticket."

The passenger turns around looking at the inspector.

Passenger: "Why do I need to show it? I did not see the number [of the bus]." *The passenger walks further to the front of the bus.*

Inspector: "Can you please keep the front doors closed **#physical dominance#**?" *The inspector now loudly asks the bus driver.*

The passenger again turns his head to look at the inspector with a firm look. He now repeats that he is not on the correct bus and that he was on the phone.

Inspector: "You still entered the bus. Do you have something with your name on it that I can see?"

The passenger then looks away, not wanting to respond to the question and then looks again at the inspector with reproach.

Inspector: "Listen, I do not want to discuss it" **#authority#**

Passenger: "What can I do about that?"

The passenger now moves towards the inspector, who remains fixed **#physical dominance#**. *The passenger attempts to push his way through* **#aggression#**. *He is unsuccessful and accepts the fine.*

Returning to the statistical model, we further find that accommodation actions are negatively associated with passenger aggression (Hypothesis 3), with a Bayes factor offering substantial support in favor of this association. The odds ratio has a large magnitude, suggesting that the display of accommodating actions makes the risk of passenger aggression approximately seven times smaller (inversed: 1/0.14 = 7.14). The negative association between accommodation and aggression is illustrated by case 3:

CASE 3:

A male passenger enters the bus and walks to the door in the middle of the bus. The inspector, who has been sitting at the back of the bus, approaches the new passenger, while his colleague walks to the front of the bus.

Inspector: "Hi."

Passenger: "Hey. Two seconds, I just have to scan [his travel card]."

Inspector: "Oh. You should have scanned it when you entered. Can I just see your…" *Inspector checks another man's ticket while interacting with the passenger.*

Passenger: "I haven't... I wanted to enter here [pointing at the middle door of the bus]. I could tell that it was only that door [pointing towards the front door of the bus] that opened."

Inspector: "Well, I saw you come in [pointing towards the front door]. You were able to scan your card when you entered. You stood here, you waited, you saw us" **#authority#**

The passenger now refers to another ticket that he has on his phone.

Inspector: "Yes, but you could have scanned it when you entered. It was only when you noticed my colleague who passed you" #**authority**#

Passenger: "Usually I enter from … [points again at middle door]"

Inspector: "Sorry, I cannot accept it. Sorry **#accommodation#**. Do you have anything with your name on it?"

Passenger: "Really?" *He asks while grabbing his beanie hat and looking wronged.*

Inspector: "Yes, unfortunately **#accommodation#**. You have to scan it when you enter the bus. You should not do it afterward."

Passenger: "No, no, but [the passenger points to the floor in the middle of bus] it is only one stop."

Inspector: "I know, I know. But I have to follow the rules, right? **#accommodation#** I have to follow the rules."

The inspector repeats the reasons for the decision and the passenger accepts the fine.

For the sensitivity analysis, we report the average *p*-value for each of the main predictors across 52 alternative model and data specifications. With an average *p*-value of .048, authority actions remain a barely significant predictor of passenger aggression. The statistical fragility of this relationship is further emphasized by the small Bayes factor (BF_{10} = 2.56), which offers weak evidence in favor of an association. Physical dominance actions have an average *p*-value of .013, which further evidences that this predictor is robustly associated with passenger aggression. Accommodating actions in the confirmatory model were significantly negatively associated with the likelihood of passenger aggression ($p = .033$). However, with an average *p*-value of .058 over the course of the sensitivity analysis, this association should be considered fragile and be interpreted with caution.

Regarding the included control variable, we find that the assessed gender of the passenger is not associated with the aggression outcome ($p = .349$). In fact, the Bayes factor offers substantial evidence in favor that this variable is non-associated ($BF_{10} = 0.14$). In the sensitivity analysis, we also assess the influence of inspector gender and find no association between this predictor and passenger aggression ($p = .544$, $BF_{10} = 0.10$). In the sample, female inspectors were only involved in two of the 16 incidents in which a passenger became aggressive (for further details, see Supplementary Materials at osf.io/z8kfh). Regarding passenger age, the model suggests that this predictor is associated with aggression, given that it is perfectly related with the outcome and thus is omitted from the models—a technical feature of logistic regression known as complete separation (Menard, 2010). This implies that none of the passengers younger than 16 years old in the current sample displayed aggressive behavior.

Discussion

In the current study, we utilized body-worn camera footage recorded by bus ticket inspectors to examine the behavioral risk factors associated with passenger aggression in ticket fining events. With a logistic regression model, we examined how the actions of ticket inspectors may shape their victimization risk. As proposed by hypothesis 1, we found that authority actions are positively associated with passenger aggression. The association is statistically fragile, however, and should therefore be interpreted with caution. As proposed by hypothesis 2, we found that physically dominating actions are positively and robustly associated with aggressive responses. Finally, as proposed by hypothesis 3, we found that the accommodation actions of ticket inspectors were negatively, but not overall robustly, related with passenger aggression.

These findings suggest that *how* inspectors interact with passengers shape their risk of being victims of aggression. In 13 percent of the ticket fining events, aggression arose from the inspector-passenger encounter (i.e. character contest). This indicates that in most cases, inspector and passenger are likely to reach a common definition of the event (Suquet, 2010), thus terminating the negotiation without escalation. Here, the negative association between accommodating actions and passenger aggression suggests that expressions of sympathy for the unfortunate or shameful experience of others (Clark, 1997) may be a useful strategy that allows ticket inspectors to help a passenger save face and thus minimize the risk that the passenger escalates the interaction. Our analysis highlights the importance of understanding risks as related to the behavioral actions *within* events, rather than to personal properties or wider organizational circumstances. This is in line with situational studies of violence and conflict, emphasizing that interactional dynamics play a key role in shaping the course of interpersonal aggression (Collins, 2008; van Reemst, 2016) and with situational crime prevention approaches focusing on situational measures of crime prevention rather than dispositional (Clarke, 1980).

To examine whether our model is misspecified with respect to personal characteristics of the inspectors (e.g., age, level of experience) that may correlate with the aggression outcome, we calculated an median odds ratio (MOR) for data, capturing the extent to which the aggression outcome concentrates around specific inspectors (Merlo et al., 2006). This was possible because the same ticket inspector was recorded in several fining events allowing for an assessment of the extent to which actions were primarily related to specific individuals or to the type of interactions they engaged in (Lindegaard, Bernasco, & Jacques, 2015). Concentration around specific inspectors could indicate that some unmeasured properties of the inspectors shape the aggression risk. The MOR was however only 1.19, suggesting that inspectors at higher risk are 1.19 times more likely to be victimized than lower at-risk inspectors. This should be considered a small difference, thus suggesting that the aggression events are fairly evenly distributed across the inspectors. This lends further support for the situational interpretation that the victimization risk should be accounted for by the interactions of the inspectors rather than their personal characteristics. Adding to this, male passengers were not found to be more likely to act aggressively against the inspectors; a result in line with Deibert and Miethe (2003) finding that character contests are equally common across assessed gender and age groups. Taken together, these findings indicate that the aggressive escalation of the events relate to interactional dynamics that unfold, at least partially, uncoupled from who the partaking inspectors and passenger aggressors are.

Our analysis of inspector-passenger encounters provides detailed insights into patterns of behavioral actions in *both* aggressive and non-aggressive events. This approach is uncommon for aggression studies relying on video data and studies examining dispute-related violence, which tend to be sampled on the dependent variable (e.g., cases of violence). Without comparisons to non-violent cases, the analysis would have yielded limited explanatory insights into how the victim actions influence the subsequent offender responses (Geddes, 1990). Our findings confirmed the relevance of victim behavior for the risk of aggressive offender actions, as suggested by previous studies of violence (Block, 1981; Katz, 1988; Liebst, Lindegaard, & Bernasco, 2019).

Further, the low severity of aggression in our sample adds to violence studies by examining an event type, which is less severe than the ones typically investigated in this field, e.g. police reported homicides (Luckenbill, 1977) or assaults (Deibert & Miethe, 2003). This comparative case sheds light on the micro-interactional steps by which face-to-face conflicts develop towards increased escalation, a process which, despite wide scholarly interest, remains largely unexamined (Levine, Taylor, & Best, 2011).

Limitations

To this point it should be added, however, that the proportion of low severity cases may be overrepresented in our sample. During our preliminary fieldwork, we encountered that some inspectors were unwilling to record potentially incriminating incidents (e.g., violent ones), or forgot to turn on their cameras. As such, it should be recognized that the current data and results may be biased towards low severity cases that do not turn violently. Additionally, data only gave access to a very limited extent of person-specific factors, and is thus lacking in factors such as dispositional aggressiveness and past experiences of using violence (Wieviorka, 2014).

Another study limitation concerns the extent to which we managed to capture the actual sequential steps of the inspector-passenger interaction and our ability to claim that inspector action may impact passenger responses in a causal manner. Specifically, the inspector actions may be associated with unmeasured "cues" signaling that the passenger is about to behave aggressively (e.g. via dominance cues, see Hall et al., 2005, and physical size, see Burgoon & Dunbar, 2006). For example, it is plausible that the inspectors acted physically dominating because they expected the passenger to act aggressively if taking an alternative position. One study of violence, based on offender interviews, suggests that expectations of the other's response may influence actions in violent encounters (Lindegaard et al., 2015).

While such unmeasured cues might shed light on the reasons for inspector behavioral actions, such insights, however, would not change our conclusions that certain inspector actions are correlated with particular passenger responses.

In the current study we did not obtain a sufficient sample size for multi-level modeling (McNeish & Stapleton, 2016), a more accurate method to account for actions nested within inspectors. As such, the findings should be viewed as tentative and need to be replicated. Also, future studies should assess the reliability of measures with independent raters, which due to financial constraints was not possible for the current study.

Research Implications

The unique approach of analyzing body-worn camera recordings of inspector-passenger encounters extends previous work by detailing how specific *kinds* of actions may influence interpersonal aggression. Behavioral aggression analyses with this level of micro-detail are rare in the literature, which tends to rely on retrospective victim accounts (Bowman et al., 2018; Collins, 2008). Such self-reports are known for biases related to memory failure and social desirability issues and for providing a coarse-grained picture of the actions that unfolded or their sequential order within criminal events (Vrij, Hope, & Fisher, 2014).

We recommend more video-based research focusing on understanding the interactions in which work-related violence occurs. These studies could sample 24-hour recordings of employee-citizen encounters, rather than relying on a selection of recordings made by employees (Lindegaard & Bernasco, 2018). This would also ensure the inclusion of events that inspectors tacitly anticipate as unproblematic, e.g. due to certain personal characteristics of the passengers, as well as events in which aggression is prevented before the fining event started. This video-based research should prioritize triangulation of data sources (e.g. interviews, surveys, police cases), allowing assessment of the relative and combined influences of situational and personal factors (see Fleeson, Noftle, & Compass, 2008).

Prevention and Policy Implications

Our findings highlight the importance of developing situational intervention measures for the prevention of workplace aggression. As electronic tickets bought too late leave space for negotiation and character contest, we recommend that greater information is available to the passengers regarding the necessity of purchasing an electronic ticket before entering the bus. Another preventive strategy would be to install an app on the electronic device used by inspectors that warns them when a ticket fining event exceeds beyond several

minutes. In our data, interactions lasting several minutes—typically because of a negotiation prolonging the event—were associated with a higher victimization risk of the inspectors[4]. A warning would offer the inspectors a simple and cost-efficient means to known when to withdraw from the encounter or to be more cautious about their actions.

Our findings highlight the responsibility carried by employers to prepare their employees for the job. If workplace aggression, as the current results indicate, may be prevented through certain actions of the employees, this could inform the formal instruction and training of ticket inspectors. In particular, it is advisable that efforts are taken to avoid the use of physically dominating actions during passenger encounters—an action strategy that our analysis highlights as robustly associated with exposure to aggression, and an action which is found associated with exposure to physical violence in studies on armed robberies (Liebst, Lindegaard, & Bernasco, 2019) and injuries in armed sexual assaults (Ullman & Knight, 1993). Finally, it may be considered whether our results apply to other law enforcement agents, such as police and correctional officers, and perhaps other types of employees in public functions, such as bouncers and nurses, who also face conflictual citizen encounters in their work life. Future studies should examine and compare the outcome of action strategies across diverse employee functions, with the aim of developing employee specific behavioral intervention measures for the prevention of workplace aggression.

[4]Note that this association between event duration and victimization is statically significant. For further details please see Supplementary Materials, Table S2 at osf.io/z8kfh.

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