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To cite this article: Keren Turgeman-Lupo & Michal Biron (2016): Make it to work (and back home) safely: the effect of psychological work stressors on employee behaviour while commuting by car, *European Journal of Work and Organizational Psychology*, DOI: [10.1080/1359432X.2016.1228628](https://doi.org/10.1080/1359432X.2016.1228628)

To link to this article: <http://dx.doi.org/10.1080/1359432X.2016.1228628>



Published online: 12 Sep 2016.



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Make it to work (and back home) safely: the effect of psychological work stressors on employee behaviour while commuting by car

Keren Turgeman-Lupo^a and Michal Biron^{a,b}

^aDepartment of Business Administration, Faculty of Management, University of Haifa, Haifa, Israel; ^bDepartment of Human Resource Studies, Tilburg University, Tilburg, The Netherlands

ABSTRACT

Despite empirical data suggesting that commuting accidents are a major problem worldwide, research on employee behaviour while commuting by car is scant. In particular, our understanding of the antecedents of unsafe commuting behaviour is limited mainly to demographic variables and work-related physical stressors. Our study addressed this lacuna by investigating the association between work-related psychological stressors and unsafe commuting behaviour. In addition, we developed and validated a scale for measuring commuting norms and considered the permissiveness of these norms as a mediator in the stressor-commuting behaviour association. The results, based on data collected from 216 employees in a large manufacturing plant at 2 points in time, indicated that abusive supervision and work-family conflict were both positively related to unsafe commuting behaviour, and that the permissiveness of commuting norms partially mediated these relationships. The potential role of work organizations in educating employees about commuting behaviour and driving safety is discussed.

ARTICLE HISTORY

Received 23 December 2015
Accepted 20 August 2016

KEYWORDS

Abusive supervision;
commuting behaviour;
commuting norms;
work-family conflict

Introduction

Work-related traffic accidents, defined as road accidents occurring during working hours or during the commute to or from work, are one of the main causes of occupational death (Harrison, Mandryk, & Frommer, 1993; Salminen, 2000). In the United States, for example, between 2003 and 2009, 35% of occupational fatalities reported by the Bureau of Labor Statistics were associated with motor vehicles (National Institute for Occupational Safety and Health [NIOSH], 2010). In light of these data, research aimed at reducing mortality rates has sought to identify potential antecedents of work-related traffic accidents (e.g., Barger et al., 2005; Zepf, Voelter, Wriede, Husemann, & Escobar, 2010). Much of this research has focused on accidents that take place during working hours and has mainly considered driving behaviours and traffic accidents of professional drivers (e.g., truck drivers) or employees who travel extensively during their working hours (e.g., salespeople; Gregersen, Brehmer, & Morén, 1996). However, little is known about driving behaviour among employees who use cars for commuting. Among those few studies that have considered commuting behaviour, only a handful studied commuting in isolation from other work-related driving behaviours (i.e., driving during working hours; e.g., Salminen, 2008).

The dearth of research on commuting behaviour is notable in light of the vast numbers of employees who commute each day (e.g., employees who live in non-metropolitan areas and work in metropolitan areas; So, Peter, & Daniel, 2001) and the correspondingly large numbers of commuting accidents. In Germany, for example, a total of 178,590 commuting accidents occurred in 2009 (DGUV Statistics, 2009). Although these data

make no distinction between commuting by public transit and commuting by car, prior research has found that the former is safer than the latter (Chiron, Bernard, Lafont, & Lagarde, 2008; Zepf et al., 2010). In this study, we seek to address the call to identify risk factors of unsafe driving behaviour among employees who commute by car (Zepf et al., 2010).

The literature on commuting behaviour has mainly considered demographic factors (age, gender, occupation). For example, younger, blue-collar male employees are more likely to be involved in commuting accidents than older, white-collar female employees (Chiron et al., 2008; Zepf et al., 2010). Other studies have examined variables characterizing the ride itself (distance, time). For example, it was found that accident rates are higher during the winter than during other seasons (Trimpop, Kirkcaldy, Athanasou, & Cooper, 2000). Personal characteristics, such as conscientiousness, have been linked to commuting behaviour (Elfering, Grebner, & Haller, 2012). Researchers have also considered working conditions and in particular physical work stressors. For example, driving after a night shift was positively related to unsafe commuting behaviour and involvement in commuting accidents (Åkerstedt, Peters, Anund, & Kecklund, 2005).

Prior research on driver stress (defined as reactions to the appraisal of driving as being demanding or dangerous; Gulian, Glendon, Matthews, Davies, & Debney, 1990) has concluded that, for many employees, commuting is a mental and physical burden, giving rise to various complaints and dissatisfaction (Feng & Boyle, 2013; Gulian et al., 1990; Koslowsky, 1997; Novaco & Gonzales, 2009; Novaco, Kliewer, & Broquet, 1991; Novaco, Stokols, & Milanese, 1990; Stutzer & Frey, 2008). Yet, to

our knowledge, work-related psychological stressors have not been studied as potential factors in unsafe commuting behaviour. In the current study, to address this gap, we have drawn from two conceptual models (multiple resources theory [MRT]; Wickens, 1984; and spillover theory; Lambert, 1990) to propose that two such stressors – namely, abusive supervision and work–family conflict (WFC) – may exert psychological demands upon employees and encourage unsafe commuting behaviour.

Recognizing the importance of personal norms in predicting behaviour (e.g., Cialdini, Reno, & Kallgren, 1990; Terry, Hogg, & White, 2000) in this study, we have also developed and validated a scale for assessing commuting norms – i.e., the degree to which an employee perceives certain behaviours as legitimate and acceptable during commuting rides. Drawing from the theory of reasoned action (TRA; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), we examined the role of such norms in the associations between psychological stressors and commuting behaviour. Figure 1 illustrates the research model.

Psychological stress and commuting behaviour: theoretical foundations

MRT (Wickens, 1984) suggests that a person’s capacity to perform multiple tasks simultaneously is dependent on the availability of sufficient resources to devote to these tasks. When the quantity of resources that a person feels required to expend exceeds the quantity at her disposal, she is said to experience mental workload (Wickens, 2002). In the context of driving, such a resource imbalance (i.e., an imbalance between the demands of driving and the driver’s coping resources) has been shown to trigger driver stress (Gulian et al., 1990; Machin & Hoare, 2008; Rowden, Matthews, Watson, & Biggs, 2011). MRT further proposes that engaging in two common processing tasks at the same time may impede performance on each of the tasks. For example, texting and driving both require manual and cognitive abilities, and thus may interfere with each other, potentially leading to unsafe driving behaviour (Wickens, 2002). Consistent with this theory, the need to perform multiple tasks while driving was found to increase drivers’ mental workload, distract them and lessen the safety of their driving (Harbluk, Noy, Trbovich, & Eizenman, 2007; Patten, Kircher, Östlund, & Nilsson, 2004). On the basis of these ideas, we propose that an individual who commutes by car while subjected to psychological stress is likely to experience mental workload – which may be reflected in his or her commuting behaviour.

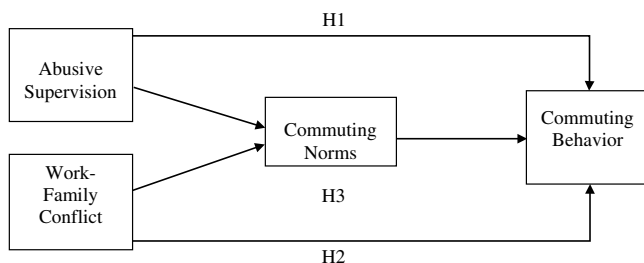


Figure 1. Research model.

Spillover theory (Lambert, 1990; Meissner, 1971; Zedeck, 1992) refers to situations of “mutual influence”, in which an individual’s work and nonwork activities influence one another through permeable boundaries (Crouter, 1984; Lambert, 1990; Zedeck, 1992). In these situations, stress created in one domain is likely to “spill over” or interfere with the individual’s ability to meet demands in other domains (Barnett, 1994; Greenhaus & Beutell, 1985; Grotto & Lyness, 2010). We suggest that an individual might experience such spillover during commuting, because commuting – unlike other types of driving activities – may be viewed as an extension of several life domains (although it can also serve as an opportunity to take a break from daily routine and demands; Novaco & Gonzales, 2009). A commuter may perceive the journey as an integral part of the work day, during which he or she must attend to work-related tasks (Elfering, Grebner, & de Tribolet-Hardy, 2013). Yet the commuter might also use this time to engage in household activities (Kirkcaldy, Trimpop, & Cooper, 1997; McGuckin & Murakami, 1999). Eventually, the stress resulting from addressing work and nonwork demands encountered while commuting may accumulate and contribute to unsafe commuting behaviour.

Abusive supervision and commuting behaviour

Whereas some evidence exists on the effect of psychological work climate on driving in general or among professional drivers (e.g., Rosenbloom, 2011), to our knowledge, a study by Kirkcaldy et al. (1997) is the only one examining how variables reflecting the work climate – namely, relationships at work – influence commuting behaviour. The authors found that positive interpersonal relations at work – assessed using a single item asking employees about their relationships with other employees and the organization leadership – were associated with a reduced risk of commuting accidents among medical staff. We extend this work by specifically focusing on the stress associated with the employee’s relationship with his or her direct supervisor. This direction of inquiry is based on the fact that supervisors often frame the context in which employees operate, which is essential in explaining employee perceptions and behaviours (Aselage & Eisenberger, 2003).

One way to characterize employees’ relationships with their supervisors is by assessing perceived abusive supervision, defined as subordinates’ perceptions of hostility in supervisors’ verbal and nonverbal behaviours, excluding physical contact (Tepper, 2000). Abusive supervision was found to have negative effects on employees’ lives both in and outside of the workplace, with the latter reflected, for example, in increased aggressive behaviour (e.g., Mitchell & Ambrose, 2007) and drinking problems (Bamberger & Bacharach, 2006).

We propose two reasons why abusive supervision may influence commuting behaviour. *First*, abusive supervision may impose significant psychological distress, characterized by dysfunctional thoughts and negative feelings, and thus emotionally disturb employees (e.g., Chan & McAllister, 2014; Chi & Liang, 2013) and distract them while commuting. Indeed, Pereira, Müller and Elfering (2015) found that social stressors generated by supervisors predicted attention

failure at work and increased work reflections during leisure time. *Second*, Bassman and London (1993) argued that the behaviour of abusive supervisors might be driven by a desire to elicit obedience. This implies that abused employees might be cognitively motivated to engage in certain behaviours that reflect obedience and commitment to the supervisor. Employees also use ingratiation tactics, such as flattery and doing favours, as possible means of coping with abusive supervisors (Harvey, Stoner, Hochwarter, & Kacmar, 2007). These tactics might reflect a more general desire to please the supervisor, stemming either from a dependency relationship between the employee and the supervisor, or from the employee's desire to avoid being further abused (e.g., Bassman & London, 1993; Monks et al., 2009). Motivated to please the supervisor, employees may work while commuting (e.g., answer phone calls, read messages). We posit:

Hypothesis 1: *Abusive supervision is positively associated with unsafe commuting behaviour.*

WFC and commuting behaviour

WFC involves difficulties with integrating work and family responsibilities (Greenhaus & Beutell, 1985). The stress associated with WFC is ongoing in nature, such that it interferes with employees' functioning in both the work and home domains, and thus continues to present a concern when employees commute (Guest, 2002; Parkes & Langford, 2008). In this respect, Kirkcaldy et al. (1997) found that women with more dependent children were more likely than men or than women having fewer dependent children to be involved in commuting accidents; the authors suggested that this finding may reflect additional burdens placed on these employees, which may be a risk factor for unsafe commuting. However, this hypothesis has yet to be empirically examined.

Given that commuting is at the junction of the work and home domains, WFC may be highly relevant for understanding commuting behaviour (Stutzer & Frey, 2008). Two lines of reasoning support this proposition. *First*, the stress associated with WFC may emotionally disturb employees during their commute and lead to unsafe commuting behaviour. Specifically, for employees who use the commute as a time of reflection (Novaco & Gonzales, 2009), WFC may trigger negative feelings and worries – as in the case of an employee who has missed a child's school event in order to complete a task at work and is concerned about the child's disappointment. *Second*, employees experiencing WFC may instrumentally try to compensate those whom they feel were not receiving their attention/assistance during the day (family members, friends, co-workers etc.), while commuting (with phone calls, emails, text messages etc.). For example, they may use the commuting time for talking with their children, and by doing so try to reduce feelings of guilt associated with long working hours. Such behaviours are likely to divert employees' attention from the drive (Drews, Yazdani,

Godfrey, Cooper, & Strayer, 2009; Redelmeier & Tibshirani, 1997). We therefore posit:

Hypothesis 2: *Work–family conflict is positively associated with unsafe commuting behaviour.*

Commuting norms as a mediator

The associations of abusive supervision and WFC with unsafe commuting behaviour may involve not only direct but also indirect effects. One potential mechanism through which these psychological stressors may affect commuting behaviour is by influencing the commuting norms individuals hold. According to TRA (Ajzen & Fishbein, 1980), an individual's *intention* to perform a display of behaviour is the most important predictor of whether he or she will actually perform that behaviour. One of the main factors influencing behavioural intentions is subjective norms, referring to what an individual believes is socially appropriate behaviour. These notions of TRA have been supported with respect to a variety of behaviours, e.g., smoking (Budd, 1987) and absenteeism (Bamberger & Biron, 2007).

In a somewhat similar vein, individuals' driving styles, referring to driving habits that individuals have established over the years, are key predictors of driving outcomes (e.g., Elander, West, & French, 1993; Nabi et al., 2005; Reason, Manstead, Stradling, Baxter, & Campbell, 1990). Commuters in particular often have specific habits based on what they consider to be legitimate or illegitimate acts while on the ride to and from work and which may differ from the habits they engage in on other types of rides. Thus, employees develop commuting norms or sets of beliefs, perceptions and attitudes towards commuting. According to TRA, and similarly to normative influence in other domains (e.g., absence norms, ethical norms), these commuting norms may play a significant role in employees' actual commuting behaviour (e.g., Elander et al., 1993; Terry et al., 2000). We propose that stricter commuting norms (i.e., norms involving alertness, careful driving, consideration of other drivers) may lead to safer commuting behaviour, whereas permissive commuting norms may lead to unsafe driving behaviour.

We also posit that commuting norms mediate the associations of abusive supervision and WFC with commuting behaviour. Work-related stressors may create legitimization among employees for developing permissive, potentially harmful norms (Bacharach, Bamberger, & Sonnenstuhl, 2002). For example, WFC was found to relate to negative health-related habits (with regard to physical activity and food choices; Roos, Sarlio-Lähteenkorva, Lallukka, & Lahelma, 2007) and daily alcohol use (Bacharach et al., 2002; Wang, Liu, Zhan, & Shi, 2010). Accordingly, we suggest that abusive supervision and WFC may influence commuting behaviour by incentivizing the development of more permissive commuting norms. That is, employees who experience abusive supervision and WFC may view these stressors as legitimate reasons for engaging in risky commuting behaviour, as a means to cope with their stress and reduce stress levels – to avoid being abused by their supervisors or to restore the balance between work and

family. For example, employees may assume that, during the commute, it is appropriate to increase driving speed to avoid arriving late at work/home. Such perceptions, in turn, may lead to unsafe driving behaviour. Thus, we propose:

Hypothesis 3: *Commuting norms partially mediate the association of abusive supervision and work–family conflict with commuting behaviour.*

Method

Data collection procedure and ethics

Access to the organization was gained through contact with the CEO and personnel manager. The study was conducted using a two-wave design, including survey data collected from the same employees at two different points in time (Time 1 and Time 2, 24 months apart). We applied scientific standards of research to protect our respondents. Both authors were certified by the National Institutes of Health (NIH) Office of Extramural Research for completing the NIH web-based training course “Protecting Human Research Participants”. In accordance with the NIH guidelines, we clearly notified all survey respondents (in a written instructions page) that participation was voluntary; that they could withdraw from the study at any time with no implications; that only the authors could access the data; and that all data would be kept confidential. At Time 1, respondents received an e-mail comprising the instructions page and a link to an electronic survey, which was located on a secured website. At Time 2, we repeated the same procedure. At Time 1, we assigned each participant a unique four-digit code, which enabled us to link that person’s Time 1 data with his or her Time 2 data.

The Time 1 and Time 2 surveys each included 160 items and took approximately 20 min to complete. We created temporal and psychological separations in each survey by listing the items measuring the key concepts nonconsecutively. In doing so, we sought to attenuate the risk of common method bias, if only slightly, by increasing the likelihood that participants would respond to each set of key items without recalling their responses to prior sets (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To encourage participation, we informed employees that those who completed the surveys would be entered in a raffle for two \$65 USD gift cards.

Sample

Our sampling frame consisted of 361 employees working in a large manufacturing plant in the electronics industry, who were employed at least 12 months prior to the administration of the Time 1 survey, and who regularly commuted to work by car (i.e., not by company shuttles or public transportation). Of these 361 employees, 216 employees agreed to participate and completed the first survey (Time 1; a response rate of 60%). Of these 216 respondents, 117 were males (54%), and the mean age was 35.9 years. The average commuting distance was 29 km (per one-way drive). Of the 216 respondents who completed the Time 1 survey, 71 respondents (33%) also

completed the Time 2 survey. Employees who responded to the Time 2 survey were compared with those who did not respond (those who dropped out of the study; Cable & Parsons, 2001). Compared with employees in the latter group, employees in the former group had a significantly shorter ride distance and held significantly stricter commuting norms. This suggests that, if anything, our results err on the side of being conservative. Among Time 2 respondents, 33 were males (46.5%), and the mean age was 35.4 years. The average commuting distance at Time 2 was 25 km.

Measures

Perceived abusive supervision

This variable was measured using Tepper’s (2000) 15-item measure. Participants were asked to indicate the frequency with which their supervisor engaged in such behaviours as “Breaks promises he/she makes”, “Makes negative comments about me to others” etc. Participants responded by rating a 5-point response scale ranging from 1 (“Cannot remember him/her ever using this behaviour with me”) to 5 (“He/she uses this behaviour very often with me”).

WFC

This variable was measured with a 4-item scale by Frone, Russell and Barnes (1996). Participants were asked to rate the frequency with which they encountered such situations as “Your work or career interferes with your private life (e.g., gardening, cooking, cleaning, repairs, shopping, paying bills etc.)”. They responded by rating a 5-point scale ranging from 1 (“never happens”) to 5 (“always happens”). Higher scores were indicative of greater WFC.

Commuting norms

As noted earlier, the literature lacks a scale designed to measure commuting norms. Following convention for scale development in the social sciences (Schutte et al., 1998), we developed a commuting norms scale. Appendix 1 presents a description of the development of the scale. The scale included 11 items (see Appendix 2). Participants were asked to indicate the degree to which they viewed engagement in specific behaviours as legitimate or justifiable (“OK”) while driving to or from work (using a 7-point response scale ranging from 1 – “strongly disagree” to 7 – “strongly agree”). A respondent who rated a greater number of activities as highly justifiable would be considered to have more permissive commuting norms.

Commuting behaviour

We drew from the extended 27-item driver behaviour questionnaire (DBQ; Lawton, Parker, Manstead, & Stradling, 1997; Parker, Lajunen, & Stradling, 1998), which is partly based on the original DBQ (Reason et al., 1990). The questionnaire identifies four categories of dangerous behaviours that can lead to traffic accidents: lapses, errors, violations and aggressive violations. Items were adapted to specifically reflect behaviour while driving to and from work. Past research has found that the two violation categories are better predictors of accident involvement than are the categories of lapses and errors

(Lawton et al., 1997; Parker et al., 1998). Accordingly, and since the full scale involved a large number of items and our questionnaire was already very long, we used only the 11 violation items, e.g., “disregard the speed limit on a freeway or rural highway”, with a response scale ranging from 1 (“never”) to 6 (“almost always”).

Control variables

In light of prior evidence linking gender, age and ride distance with an elevated risk of being involved in commuting accidents (e.g., Charbotel, Chiron, Martin, & Bergeret, 2001; Salminen, 2000; Trimpop et al., 2000; Zepf et al., 2010), we controlled for these variables in our analyses.

All statistical analyses were performed using the IBM SPSS Statistics software package version 21 (IBM Company, New York, NY, USA).

Results

Means, standard deviations, scale reliability and correlations among the study variables are presented in Table 1. Due to the relatively high dropout rate of participants from Time 1 to Time 2 (67%), the study hypotheses were tested twice, alternately considering commuting behaviour at Time 1 (Tables 2 and 3) and at Time 2 (Tables 4 and 5) as the dependent variable.

Main effects of abusive supervision and WFC

Hypotheses 1 and 2 proposed, respectively, that abusive supervision and WFC would be positively associated with unsafe commuting behaviour. Tables 2 (Step 2) and 4 (Step 2) support both main effects, showing that perceived abusive supervision and WFC at Time 1 were positively and significantly related to unsafe commuting behaviour at both Time 1 and Time 2. The inclusion of both psychological stressors resulted in a significant increase in the total effect size relative to Step 1, which included only the control variables.

Mediation effect of commuting norms

Hypothesis 3 proposed that commuting norms would partially mediate the associations of abusive supervision and WFC with unsafe commuting behaviour. Following conventions for testing mediation effects (Baron & Kenny, 1986), we first tested whether the independent variables were positively associated

with the proposed mediator (commuting norms). As shown in Tables 3 and 5 (Step 2), respectively, abusive supervision and WFC were significantly related to commuting norms at Time 1 and at Time 2. Second, we tested whether the proposed mediator was positively associated with the dependent variable. Step 3 in Tables 2 and 4 confirms this condition. This step also fulfils the third and final condition for a mediation effect, namely, that the relationship between the independent variable and the dependent variable becomes weaker when controlling for the mediator. Specifically, for Time 1 commuting behaviour, the B for abusive supervision dropped in magnitude and so did the B for WFC. For Time 2 commuting behaviour, the B for abusive supervision and for WFC became non-significant. Figures 2 and 3 illustrate the research model with the values of the standardized coefficients, for Time 1 and Time 2 data, respectively.

Bootstrap results, using 5000 bootstrap samples (Hayes, 2013), also confirmed the indirect effect at both Time 1 and Time 2. Specifically, as shown in Tables 3 and 5, the 95% confidence intervals excluded zero in both Time 1 and Time 2 data, for the association between abusive supervision and commuting behaviour and for the association between WFC and commuting behaviour.

Discussion

This study examined the role of psychological stressors in employees' commuting behaviour. We proposed and tested a model that included two antecedents of commuting behaviour that have not been considered hitherto, namely, abusive supervision and WFC. The model also incorporated a mediating variable, namely, commuting norms.

Most studies on the relationship between workplace stressors and commuting behaviour have focused on stressful physical work conditions. Our research has shown that there may be additional, psychological stressors in the workplace that influence the likelihood of unsafe commuting behaviour. Notably, aside from the work of Kirkcaldy et al. (1997), our study is the only one to have considered the role of interpersonal workplace relationships in commuting behaviour. We have extended the findings of Kirkcaldy et al. (1997) by focusing specifically on employee relations with supervisors, rather than a general measure of interpersonal relations. Our findings advance knowledge on the associations between employee-supervisor relationships and employee behaviour by showing that such relationships

Table 1. Means, standard deviation, Cronbach's alpha and correlation (Pearson) of the measured variables (Time 1: $n = 216$; Time 2: $n = 71$).

Nos.	Variable	α	M	SD	1	2	3	4	5	6	7
1	Age		35.93	8.79	–						
2	Ride distance		28.98	22.80	.10	–					
3	Abusive supervision	.94	1.42	.62	–.08	.02	–				
4	Work–family conflict	.80	2.52	.96	–.15*	.16*	.29**	–			
5	Commuting norms Time 1	.90	2.52	1.16	–.04	.25**	.29**	.40**	–		
6	Commuting norms Time 2	.92	2.50	1.33	–.20 [#]	.23 [#]	.21 [#]	.36**	.32**	–	
7	Commuting behaviour Time 1	.89	1.68	.74	–.11	.01	.46**	.49**	.50**	.39**	–
8	Commuting behaviour Time 2	.93	1.83	.84	–.19	–.02	.45**	.43**	.55**	.37**	.66**

* $p < .05$, ** $p < .01$, [#] $p < .1$.

Response scale information: age: in years; ride distance: in kilometres; abusive supervision and work–family conflict: 1–5; commuting norms: 1–7; commuting behaviour: 1–6.

Table 2. Regression results ($n = 216$) – Time 1.

Predictor	B	SE B	β	p Value
<i>Step 1 (controls)</i>				
Gender	-.14	.11	-.09	.20
Age	-.01	.01	-.14	.05
Ride distance	.00	.00	.03	.71
R^2 (adjusted R^2)	.01			
<i>Step 2 (main effects)</i>				
Gender	-.09	.09	-.06	.28
Age	-.00	.01	-.04	.53
Ride distance	.00	.00	-.05	.36
Abusive supervision	.41	.07	.34	<.01
Work-family conflict	.31	.05	.40	<.01
R^2 (adjusted R^2)	.35			
ΔR^2	.34			<.01
<i>Step 3 (mediator)</i>				
Gender	-.06	.08	-.04	.43
Age	-.00	.01	-.03	.57
Ride distance	-.00	.00	-.12	.04
Abusive supervision	.34	.07	.28	<.01
Work-family conflict	.23	.05	.30	<.01
Commuting norms	.20	.04	.32	<.01
R^2 (adjusted R^2)	.42			
ΔR^2	.08			<.01
95% confidence intervals				
Abusive supervision	.02–.15			
Work-family conflict	.04–.13			

Dependent variable: commuting behaviour at Time 1.

Table 3. Regression results ($n = 216$) – Time 1.

Predictor	B	SE B	β	p Value
<i>Step 1 (controls)</i>				
Gender	-.19	.16	-.08	.25
Age	-.01	.01	-.09	.20
Ride distance	.01	.00	.26	<.01
R^2 (adjusted R^2)	.06			
<i>Step 2 (main effects)</i>				
Gender	-.15	.15	-.06	.31
Age	-.00	.01	-.02	.79
Ride distance	.01	.00	.20	<.01
Abusive supervision	.36	.12	.19	<.01
Work-family conflict	.38	.08	.32	<.01
R^2 (adjusted R^2)	.22			
ΔR^2	.16			<.01

Dependent variable: commuting norms at Time 1.

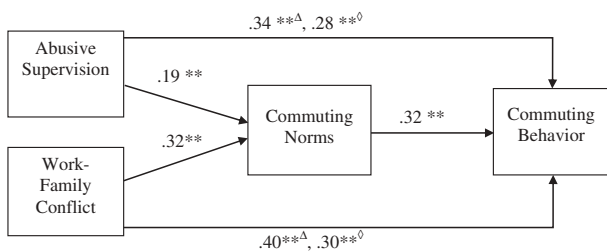


Figure 2. Research model with standardized coefficients ($n = 216$) – Time 1.

* $p < .05$, ** $p < .01$.
^ΔWithout mediation effect of commuting norms; [◊]with mediation effect of commuting norms.

Table 4. Regression results ($n = 71$) – Time 2.

Predictor	B	SE B	β	p Value
<i>Step 1 (controls)</i>				
Gender	-.10	.20	-.06	.61
Age	-.02	.01	-.20	.11
Ride distance	.00	.01	.00	.98
R^2 (adjusted R^2)	.00			
<i>Step 2 (main effects)</i>				
Gender	-.04	.18	-.02	.82
Age	-.01	.01	-.11	.33
Ride distance	-.00	.01	-.02	.85
Abusive supervision	.45	.18	.31	.01
Work-family conflict	.22	.10	.27	.03
R^2 (adjusted R^2)	.22			
ΔR^2	.24			<.01
<i>Step 3 (mediator)</i>				
Gender	.00	.17	.00	1.00
Age	-.01	.01	-.10	.31
Ride distance	-.00	.01	-.01	.90
Abusive supervision	.28	.17	.19	.12
Work-family conflict	.12	.10	.15	.22
Commuting norms	.38	.11	.39	<.01
R^2 (adjusted R^2)	.33			
ΔR^2	.11			<.01
95% Confidence intervals				
Abusive supervision	.02–.50			
Work-family conflict	.02–.26			

Dependent variable: commuting behaviour at Time 2.

Table 5. Regression results ($n = 71$) – Time 2.

Predictor	B	SE B	β	p Value
<i>Step 1 (controls)</i>				
Gender	-.18	.21	-.11	.39
Age	-.01	.01	-.11	.39
Ride distance	.00	.01	.01	.93
R^2 (adjusted R^2)	-.02			
<i>Step 2 (main effects)</i>				
Gender	-.11	.18	-.06	.55
Age	-.00	.01	-.01	.94
Ride distance	-.00	.01	-.02	.85
Abusive supervision	.47	.18	.31	.01
Work-family conflict	.27	.10	.32	.01
R^2 (adjusted R^2)	.24			
ΔR^2	.28			<.01

Dependent variable: commuting norms at Time 1.

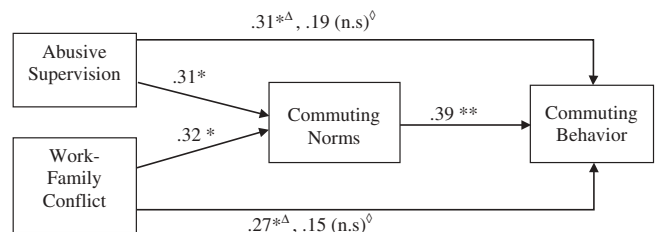


Figure 3. Research model with standardized coefficients ($n = 71$) – Time 2.

* $p < .05$, ** $p < .01$.
^ΔWithout mediation effect of commuting norms; [◊]with mediation effect of commuting norms.

are relevant not only for employees' behaviour while at work (e.g., Mitchell & Ambrose, 2007; Tepper, 2007) but also for their behaviour on the way to and from work. In this respect, our analysis supported Tepper's (2007)

conclusion that perceived abusive supervision negatively influences employees' lives outside the workplace.

Adding to past findings on the role of WFC in employees' work-related behaviours (e.g., absenteeism, job performance;

Allen, Herst, Bruck, & Sutton, 2000), our study is the first to point to the potential role of WFC, or the lack thereof, in shaping commuting behaviour. In particular, as noted earlier, the literature on driver stress has focused largely on driving in general (as opposed to the unique context of commuting) or among professional drivers (e.g., Machin & Hoare, 2008; Rowden et al., 2011), while studies on work–life balance have not focused on its role in commuting behaviour. Our findings have also provided support for spillover theory, in demonstrating how stress associated with the work and home domains (reflected in both abusive supervision and WFC) might overflow into another area in the life of the individual (commuting).

Our analysis also showed that the effects of abusive supervision and WFC on commuting behaviour were mediated by commuting norms. That is, psychological stressors might affect commuting behaviour by contributing to the development of more permissive commuting norms. This finding is consistent with Shope's (2006) observation that young drivers tend to develop driving-related perceptions that are based on their immediate environment (e.g., community norms, peers' norms, cultural norms etc.), and that these perceptions significantly affect the extent to which drivers engage in unsafe driving behaviours (e.g., speeding, impaired driving, unsafe passing etc.). In another study, Shinar (1998) found that cultural norms are associated with aggressive driving behaviours, such as honking and running red lights. The commuting scale developed and validated in our study further refined these findings by showing that norms related to the specific context of commuting (rather than more general, culture-related norms) should be considered as well.

Notably, the relationship between workplace stressors and individual employees' commuting norms may be reflected in broader contexts – i.e., norms characterizing other individuals and groups/units within the organization. Employees may tend to adopt a group's norms and to act upon them in an attempt to avoid social rejection, that is, to demonstrate that they “belong” (Kelman, 1961). Although the current study did not test for the potential effects of peers' commuting norms, the commuting norms scale that was developed for the current study might be a useful tool for researchers seeking to explore such peer-based influence.

Finally, as an addition to the key findings discussed earlier, we note that at Time 1 ($n = 216$) four predictors were significant, whereas at Time 2 ($n = 71$) only one predictor was significant. This outcome reflects the increased power generated by the larger sample size at Time 1 (Van Voorhis & Morgan, 2007).

Limitations and suggestions for future research

This study has several limitations, which offer avenues for future research. First, research data were collected using single-source, self-report questionnaires. Future research should consider data collected from additional sources (e.g., actual commuting accidents; police reports on traffic violations). Second, the commuting norms scale was developed for the purpose of the current study. Future research should further examine the scale's psychometric properties. Third, in the current study we focused on individual commuting norms. Future research may consider

group-based commuting norms, or commuting norms at the unit/organization level, which may be particularly relevant for individuals who strongly identify with their co-workers (e.g., Johnston & White, 2003). Fourth, data were collected from workers employed in only one plant in a single sector (the electronics industry). More research is needed to examine whether the findings can be generalized to other work populations. A fifth limitation relates to the relatively high dropout rate between the first survey and the second one, although, as noted earlier, we were able to alleviate this concern by comparing those who responded to both surveys with those who dropped out after the first survey. Last, our study did not consider the differences between commuting from work and commuting to work (Elfering et al., 2012, 2013). Future research should consider the unique experiential characteristics associated with the two different types of commutes.

Implications

Despite its limitations, this study offers important theoretical and practical implications. Theoretically, our findings point to the need to expand the investigation of commuting behaviour to include psychological stressors, as well as to consider indirect effects of such stressors rather than focus exclusively on direct relationships. In addition, our study is the first to introduce and develop the concept of commuting norms and to test their influence on specific outcomes. In light of previous research on normative influences (e.g., Terry et al., 2000), we believe this concept can contribute to the understanding of commuters' behaviour. In terms of practice, the finding that abusive supervision is related to unsafe commuting behaviour suggests that organizations should be aware of and take concrete measures to mitigate the potentially negative influence of supervisors. Similarly, firms may search for ways to enable employees to better address work and nonwork responsibilities, and thus reduce their need to attend to such concerns while commuting. Finally, our findings may point to a need to enlist organizations in traffic safety enforcement efforts: firms should acknowledge the importance of commuting norms and seek ways to convince employees to adopt stricter norms, e.g., by means of education and training programmes. Examples of such efforts include fleet safety management courses available in a number of countries (e.g., Australia, France, United Kingdom; Carslake et al., 2015; Haworth, Tingvall, & Kowadlo, 2000; Murray, 2015).

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix 1. Description of the development of the commuting norms scale

- (1) An item bank was created on the basis of relevant literature and related or similar scales (e.g., the driver behaviour questionnaire [DBQ]; Reason et al., 1990). The item bank comprised a list of activities that an individual might engage in while commuting.
- (2) The item list was sent to experts in the field of commuting behaviour. Items were adjusted, deleted or added on the basis of their comments and suggestions. The result was a list of 11 items – activities as well as mindsets or behavioural styles that might characterize employee habits while commuting.
- (3) We conducted a preliminary validation to examine item clarity using a sample of 45 employees from different workplaces (e.g., insurance firm, police, high-tech firm etc.). Participants in this phase were also asked whether other items might be relevant. At this phase, only minor adjustments needed to be made on the basis of participants' comments.
- (4) To validate the scale and assess its reliability, we administered the questionnaire to a sample of 110 employees working in various organizations. We conducted exploratory factor analysis, using a maximum likelihood, orthogonal rotation method, to assess the fit of the scale's items. The results confirmed that all items loaded on a common factor (loadings ranged from .62 to .89), accounting for 59% of the total variance, with an eigenvalue of 6.5. Internal reliability was high ($\alpha = .94$). Two items also loaded on a second factor, but to a lower extent than on the first factor. The variance explained by this second factor was 11%, and the eigenvalue was 1.2. Despite the cross-loading, we decided to retain these items per experts' recommendations (that the two items conceptually fit within the scale), and also because keeping them resulted in a structure similar to that of other norm-related scales. Retaining these items did not affect the internal consistency of the scale. Furthermore, we examined the research model without these two items and all the results were replicated if the two items were dropped from the scale. This evidence provided sufficient justification for keeping all 11 items in the scale. Appendix 2 includes the factor loadings of each item.
- (5) The 110 questionnaires completed in phase (4) were also used to assess the convergent and discriminant validity of the new scale. Specifically, to test for convergent validity, we calculated the correlation between the newly developed commuting norms scale and

theoretically relevant variables (i.e., locus of control [the short scale developed by Ashton & Lee, 2009], $r = .42, p < .01$; DBQ [Reason et al., 1990], $r = .60, p < .01$; and the trait of "conscientiousness" [HEXACO-PI-R; Valecha & Ostrom, 1974], $r = -.66, p < .01$). In addition, we tested for discriminant validity by means of three theoretically distinct variables, namely, aggressiveness (Buss–Perry aggression questionnaire; Buss & Perry, 1992, $r = .15$, n.s.), "openness to experience" (HEXACO-PI-R; Ashton & Lee, 2009, $r = .06$, n.s.) and "honesty–humility" (HEXACO-PI-R; Ashton & Lee, 2009, $r = -.13$, n.s.).

- (6) Test–retest reliability was examined with another group of 15 employees who completed the commuting norms scale twice, with an interval of 2 weeks between measurements ($r = .857, p < .01$).

Appendix 2. Commuting norms scale items with factor loadings

Items	Factor loadings	
	1	2
It is OK to receive phone calls/emails/text messages related to my work, while driving to and from work	.87	-.28
It is OK to initiate phone calls/send e-mails/text messages related to my work, while driving to and from work	.87	-.17
It is OK to try to solve work-related problems, while driving to and from work	.89	-.25
It is OK to solve home/children /family-related problems while driving to and from work	.76	-.25
My workplace considers commuting time as part of the "working day" (in terms of making phone calls, reading documents while in heavy traffic etc.)	.67	.17
While driving to and from work, it is OK that my mind is concerned with work-related issues	.75	-.01
While driving to and from work, it is OK that my mind is concerned with children/family-related issues	.62	.06
To avoid being late to work, it is OK to commit driving violations (e.g., increase driving speed)	.70	.65
To avoid being late for picking up the kids or other home/family-related duties, it is OK to commit driving violations (e.g., increase driving speed)	.71	.64
I often get angry while driving to and from work due to a conversation or argument with my supervisor, a colleague or a client	.79	.25
I often get angry while driving to and from work due to a conversation or argument with a family member, friend or service representative whom I contacted on a personal matter	.76	.26