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ORIGINAL PAPER

Examining the Relationship between Experienced Workplace Incivility and Aggressive Driving Behaviors on the Work-to-Home Commute

Katrina A. Burch[1] · **Janet L. Barnes-Farrell**[2] · **Melissa B. Sorensen**[1]

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Abstract

Aggressive driving behaviors have been gaining in notoriety in recent years, with US drivers identifying aggressive driving as a serious problem. Researchers have called for understanding the contextual factors that contribute to drivers engaging in such behaviors. If individuals engage in aggressive driving behaviors during their work-to-home commutes, it is possible that some aspects of work may be associated with these behaviors. The present study examined the influence of employee's experienced workplace incivility on aggressive driving behaviors, as well as the mechanisms and conditional factors that might shed light on the nature of this relationship through the lens, and extension, of affective events theory. Data were collected via a baseline survey and daily diaries administered over the course of one working week (five days), from employees ($N = 109$) who worked full-time and commuted by private vehicle alone on a daily basis. Results indicate that on days when employees experience incivility at work, they engage in aggressive driving behaviors during their work-to-home commutes, through the negative emotions they experience during their commute. Perceived psychological contract violation during the commute was found to exacerbate this relationship. Overall, the present findings suggest that spillover effects due to experiencing workplace incivility have the potential to impact behaviors elicited during the commute, raising the risk of detrimental consequences for both the employee and employer. Practical implications and future lines of research are discussed.

Keywords Incivility · Aggressive driving behaviors · Affective events theory · Daily diary

Aggressive driving behaviors that result in road-rage incidents have been gaining in notoriety in recent years, especially with the proliferation of cell-phone use and their video-capturing capabilities. Research suggests that this media attention has exaggerated the extent of aggressive driving (Stossel, 2007). Nevertheless, drivers are identifying aggressive driving as a serious problem in the USA (AAA Foundation for Safety, 2009). Although environmental and social factors such as weather conditions and traffic congestion may precede aggressive driving, more and more research is focusing on the driver (Galovski et al., 2002). A survey conducted by the AAA Foundation for Safety (AAA Foundation for Safety, 2009) indicated that the majority of respondents believed that both roads and cars are safer today than in the past, however the biggest danger on the roads is drivers themselves. Drivers have not changed their personalities and become more aggressive people, therefore a focus is needed on the conditions that elicit aggressive driving behaviors. Researchers have called for the need to focus on *why* people engage in aggressive driving behaviors, rather than focusing on *who* the aggressive drivers are (Shinar, 1998). Understanding what precedes and predisposes drivers to engage in aggressive driving behaviors is the necessary first step in ameliorating such behaviors.

One class of drivers that is understudied in aggressive driving research are employees commuting between work and home (and vice versa). If employees engage in aggressive driving behaviors during their work-to-home commute, it is logical to expect that what happens at work may be associated with these behaviors. Specifically, aggressive driving behaviors may be an affect-driven response to events that occur during the course of the workday and spill over from the workplace to the period of time when

✉ Katrina A. Burch
Katrina.burch@wku.edu

[1] Department of Psychological Sciences, Western Kentucky University, 1906 College Heights Blvd, Bowling Green, KY 42101, USA

[2] Department of Psychological Sciences, University of Connecticut, Storrs, CT, USA

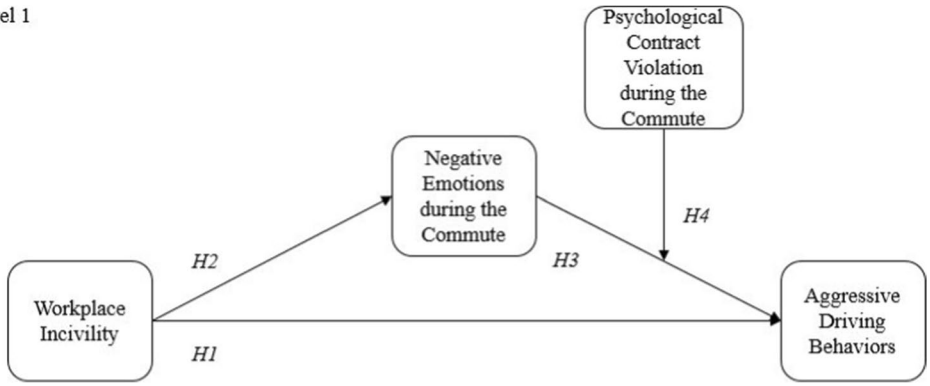

Fig. 1 Conceptual multilevel path model. Control variables excluded for parsimony

employees are physically and psychologically transitioning from work to home (i.e., the commute).

Although research has shown that work can spill over into the home and other non-work domains (e.g., Andreassen et al., 2013; Sonnentag & Binnewies, 2013), little attention has been paid to the impact that work may have on the transition time between one's work and home domains. There is some limited research suggesting that work stressors, attitudes, and experiences impact the commute through influencing risky commuting safety behaviors, defined as driving violations (e.g., speeding; Burch & Barnes-Farrell, 2020; Turgeman-Lupo & Biron, 2017). Expanding on prior work, we believe that there is also a need to examine how work, in particular experienced workplace incivility, may influence aggressive driving behaviors during employees' commute time.

Affective events theory (AET; Weiss & Cropanzano, 1996) provides a theoretical lens through which to examine the associations between incivility at work and aggressive driving behaviors. In particular, experiencing workplace incivility provides an impetus for affect-driven behaviors. While experiencing incivility may exhibit direct effects with aggressive driving behaviors, indirect effects are possible too through the association of experienced incivility with the development of negative emotions during the commute. Moreover, contextual stressors in the commuting environment, such as perceiving a psychological contract violation during the commute may exacerbate these effects on aggressive driving behaviors.

With this in mind, we examined experienced workplace incivility, negative emotions during the commute, and perceived psychological contract violations during the commute as influences on aggressive driving behaviors through the lens of AET. In doing so, we seek to elucidate how work may be associated with aggressive driving behaviors, through the application and extension of AET. The conceptual model that guides this research, which is elaborated on in the following sections, is summarized in Fig. 1.

Affective Events Theory

Affective events theory focuses on the "structure, causes, and consequences of affective experiences at work (Weiss & Cropanzano, 1996, p. 11). AET suggests that emotions are dynamic and vary overtime within individuals and that fluctuation of emotions contribute to behavioral outcomes (Weiss & Beal, 2005; Weiss & Cropanzano, 1996). Weiss and Cropanzano (1996) further theorize that work-related events (both positive and negative) are proximal antecedents to emotions. In other words, work-related experiences can elicit emotional reactions from employees, which can influence employee's behavior. Workplace incivility is considered a negative affective work-related event (Porath & Pearson, 2012) given its associations with detrimental proximal and distal outcomes, such as increased negative affect, depression, and detriments in work motivation and job satisfaction, to name a few (Cortina et al., 2001; Giumetti et al., 2013; Lim & Lee, 2011; Sakurai & Jex, 2012). Research supports that experiencing incivility is associated with negative emotions both between persons (e.g., Sakurai & Jex, 2012), and within-persons (e.g., Zhou et al., 2015).

According to AET, negative affective events elicit negative emotional reactions that are dynamic overtime (Weiss, 2002) and are associated with negative affect-driven behaviors (Weiss & Beal, 2005). The central tenets of AET are as follows: emotions vary within person and change over time; work-related events are antecedents of emotions (Cropanzano et al., 2017); and fluctuation in emotions is associated with behaviors. AET also posits that dispositions and situational factors can serve as boundary conditions in the relationships among affective events, emotions, and behavioral outcomes (Weiss & Cropanzano, 1996). Research supports that aggressive driving behaviors constitute an affect-driven behavior (Kovácsová et al., 2016), therefore aggressive driving behaviors committed during the work-to-home commute may be one such behavioral consequence to experiencing incivility in the workplace and negative emotions according to AET.

Aggressive Driving Behaviors

We define aggressive driving behaviors as "the operation of a motor vehicle in a manner which endangers or is likely to endanger persons or property," (National Highway Traffic Safety Administration, 1999). Furthermore, we utilize Neuman et al.'s (2003) advice, which states that aggressive driving behaviors need to be considered within a contextual framework that takes into account both psychological and environmental factors.

Behaviors that Constitute Aggressive Driving

Lists of aggressive driving behaviors vary substantially, with many behaviors listed serving as both aggressive- and potentially aggressive- driving behaviors, depending on the context with which the behavior is enacted (e.g., intending to behave aggressively, retaliation for perceived action against the driver). To that end, many common driving behaviors, such as speeding, tailgating, gesturing, and failure to observe road signs are indicative of potentially aggressive driving behaviors that may lead to aggressive driving behaviors. Not only that, aggressive driving behaviors have been conceptualized as a health risk behavior (Bumgarner et al., 2016), due to the notion that aggressive driving behaviors are overt, observable behaviors, which have detrimental impacts for individuals' health and safety (Deffenbacher et al., 2003; Dula & Ballard, 2003). Aggressive driving behavior as a health-risk is further supported by research indicating that aggressive driving is a risk factor for major accidents (Stephens & Sullman, 2014). Furthermore, aggressive driving behaviors can incite a retaliatory process, influencing other drivers to behave aggressively, which can exacerbate the risk of accidents (Clapp et al., 2011).

Advancing the Measurement of Aggressive Driving Behaviors

What is needed in the aggressive driving literature is an understanding of contextual factors (i.e., psychological and situational) that may influence aggressive driving behaviors. Much of the previous literature has focused on stable individual differences and demographic characteristics that may engender an individual to engage in aggressive behaviors while driving (e.g., trait anger, driving anger, hostility, age, gender; Bogdan et al., 2016; Deffenbacher et al., 2014; Haje & Symbaluk, 2014; Kováscová et al., 2016; Sullman et al., 2014). However, research suggests that the propensity to engage in aggressive driving behaviors is greater when there is heavy traffic and when individuals report more time pressure (Harris & Houston, 2010), suggesting the measurements should take into account the notion that aggressive driving can fluctuate within-person. For example, engaging in aggressive driving may be greater when individuals are commuting between work and home, as the commute often occurs for employees during rush hour times (i.e., potential for greater traffic congestion and time pressure; between the hours of 6:00–9:00 am and 4:00–7:00 pm). If employees are engaging in aggressive driving behaviors during their commute time between work and home, these behaviors may be predicated by work-related (i.e., contextual) circumstances more so than stable individual and demographic characteristics of the commuters. Thus, understanding the work-related factors that influence aggressive driving behaviors is needed with a measurement focus on within-person variability in aggressive driving behaviors.

Experienced Workplace Incivility

Workplace incivility is defined as deviant acts that are low in intensity and directed toward another organizational member with ambiguous intent to harm (Andersson & Pearson, 1999). Experiencing workplace incivility has been shown to be related to a host of negative affective, attitudinal, cognitive and behavioral outcomes for employees. For example, past research suggests that experiencing incivility is associated with: heightened emotionality (Bunk & Magley, 2013); negative emotions (Kim & Shapiro, 2008; Sakurai & Jex, 2012); depression (Lim & Lee, 2011; Miner et al., 2012); increased negative affect and lower levels of energy (Giumetti et al., 2013); decreased job satisfaction (Cortina et al., 2001; Lim & Lee, 2011), organizational commitment (Lim & Teo, 2009), and work motivation (Sakurai & Jex, 2012); lower perceived fairness (Lim & Lee, 2011); issues with task-related memory recall (Porath & Erez, 2007); intent to turnover (Griffin, 2010; Lim et al., 2008; Miner-Rubino & Reed, 2010; Wilson & Holmvall, 2013); counterproductive workplace behaviors (Penney & Spector, 2005); absenteeism (Sliter et al., 2012) and decreased job performance (Sakurai & Jex, 2012; Sliter et al., 2012).

More recent research suggests that experiencing incivility in the workplace may also impact employees' non-work lives, suggesting that experienced incivility spills over to influence attitudinal and behavioral outcomes in non-work domains. For example, Ferguson (2012) found in a matched sample of targets of incivility and their partners that targets' incivility spilled over into the family domain through transmission of the stressful experience, which influenced both target and partner perceptions of marital satisfaction and influenced partner perceptions of work-to-family conflict. In addition, Zhou et al. (2019) found that employees who experienced incivility from their coworkers and outsiders experienced more work-to-family conflict on a weekly basis,

and that this relationship was mediated by the employees' perception of burnout at work. And a recent study by Lim et al. (2018) suggests that workplace incivility is associated with hostile emotions which predicts angry and withdrawn at-home behaviors.

As noted above, AET posits that affective work experiences (i.e., experienced workplace incivility) are associated with affect-driven behavior, with aggressive driving behaviors constituting an affect-driven behavior (Kovácsová et al., 2016). Specifically, AET posits that when individuals appraise an event as negative, this induces emotion, which increases the likelihood of adverse behavioral responses. Incivility is characterized as a workplace stressor because it involves experiencing rude and condescending interactions that are subtle, with ambiguous intent to harm. This is likely to be regarded as unpleasant by the targets of uncivil interactions. Drawing from AET suggests that experienced workplace incivility as a negative workplace event should be associated with aggressive driving behaviors on the work-to-home commute (Weiss & Cropanzano, 1996). Indeed, Andersson and Pearson (1999) speculated that workplace incivility, as a relatively low intensity form of workplace mistreatment (e.g., bullying), has the potential to escalate into more intense aggressive retaliatory behaviors.

Furthermore, given evidence that daily experienced incivility spills over to employees' subsequent at-home aggressive and withdrawn behavior that day (Lim et al., 2018), it is reasonable to expect that employees who experience incivility may engage in aggressive driving behaviors as a behavioral response during the commute because the commute *precedes* the home domain. It could be that engaging in such behaviors during the commute is seen as a more appropriate behavioral outlet than the workplace. Furthermore, AET suggests that emotional and behavioral responses to experiencing workplace incivility can fluctuate on a daily basis (Zhou et al., 2015, 2019), which may elicit daily behavioral responses to these workplace events. As such, we hypothesize the following:

> Hypothesis 1: Daily experienced workplace incivility will be positively associated with daily aggressive driving behaviors.

Negative Emotions during the Commute

A central tenet of AET suggests that the mechanism by which workplace events elicit behaviors is through emotional responses to said events (Weiss & Cropanzano, 1996). This would suggest that experienced workplace incivility would elicit negative emotions, which can then influence aggressive driving behaviors. In other words, experienced workplace incivility may be associated with aggressive driving behaviors by influencing the negative emotions that employees bring into and enact during their commute. Emotion refers to response tendencies that can be both behavioral and physiological, that are brought on by significant situations (Gross, 1998). Lazarus (1993) argues that negative emotions can occur if an individual perceives a situation as threatening to his or her well-being. AET suggests that behavioral responses occur due to individuals seeking to reduce unpleasant emotional conditions that result from workplace events which interfere with goals, activities, or performance (Ashton-James & Ashkanasy, 2005; Weiss & Cropanzano, 1996). Experienced workplace incivility, as a negative workplace event that interferes with performance and well-being (Giumetti et al., 2013; Sliter et al., 2012), may be associated with aggressive driving behaviors as a behavioral response through emotions that employees bring into their commute.

Research supports that negative emotional states result from experienced incivility (e.g., Ferguson, 2012; Kabat-Farr et al., 2016; Pearson et al., 2001), and that these negative emotional states are not bounded to the work domain, and can spillover to one's home domain (Klumb et al., 2017; Lim et al., 2018; Zhou et al., 2015). In other words, negative emotions associated with experiencing workplace incivility will not necessarily stay in the workplace and dissipate when leaving the office; instead it is likely that the emotions felt as a result of experiencing workplace incivility will carry into the commute, given that the commute represents the transition between the work and non-work domains. Because incivility is associated with rude and discourteous behavior, which is ambiguous in its intent (Andersson & Pearson, 1999), it leaves targets of incivility wondering and potentially ruminating on the interactions they experienced long after the uncivil interaction is done, which can elicit prolonged emotional reactions (Lim et al, 2018; Tremmel & Sonnentag, 2018; Wang et al., 2013). Given the theoretical argument proposed by AET which states that negative workplace events (e.g., experienced workplace incivility) are associated with negative emotions (Weiss & Cropanzano), and empirical evidence which supports that negative emotions associated with daily experienced incivility carry into one's home domain to elicit distress and negative affect at home (Park et al., 2018; Tremmel & Sonnentag, 2018), it follows that negative emotions elicited from experienced incivility may be felt during one's commute and influence emotions during the commute. Therefore, we hypothesize the following:

> Hypothesis 2: Daily experienced workplace incivility will be positively associated with negative emotions during the commute.

As mentioned, experiencing negative emotions can lead to behavioral responses as a means to cope with those negative emotions. Weiss and Cropanzano (1996) argue that according to AET, emotions are associated with work experiences and can lead to behavioral consequences. It is suggested then that negative emotions likely lead to negative behaviors in order to cope with the effects of the emotion. Kabat-Farr et al. (2016) found that negative emotions resulting from experienced incivility were associated with employee personal and professional outcomes, including reduced empowerment and self-esteem, greater work withdrawal and decreased job performance. Chi et al. (2013) found that negative emotional states mediated the relationship between experienced customer incivility and negative behavioral responses (i.e., sabotaging service). Meta-analytic path analysis suggests that the relationship between experienced incivility and negative behavioral responses (i.e., counterproductive work behaviors) is mediated through negative emotional reactions (Han et al., 2020). Finally, empirical evidence supports that email incivility is associated with affect driven behavior (cyberloafing) through the association with negative emotions at the daily level (Zhou et al., 2022).

According to AET and the aforementioned theoretical and empirical arguments, which assert that emotions link workplace events with behavioral outcomes, we argue that individuals who experience incivility during the workday develop negative emotions that carry into the commute, and these negative emotions experienced during the commute may influence individuals to engage in aggressive driving behaviors. As such, we hypothesize the following:

> Hypothesis 3: Negative emotions during the commute will mediate the relationship between daily experienced incivility and daily aggressive driving behaviors.

Perceived Psychological Contract Violations during the Commute as a Conditional Factor

We propose that perceived psychological contract violations during the commute serves as a conditional factor on the aforementioned hypothesized mediation model. In order to understand perceived psychological contract violations during the commute, a brief discussion of psychological contracts is necessary. Psychological contracts are often referred to in the organizational literature as foundational to employment relationships (Schein, 1965) and embedded within social exchange theory as this explicates the individual-organizational exchange relationship. Social exchange theory (Blau, 1964) suggests that individuals enter into relationships where there is a mutual expectation that behaviors will be reciprocated. If the behaviors exhibited by an individual are beneficial, then beneficial behaviors will be reciprocated by others. If the behaviors exhibited by an individual are detrimental, then detrimental behaviors are likely to be reciprocated by others. A psychological contract refers to an individual's system of beliefs, based on either expressed or implied commitments, regarding an exchange agreement with another individual (Rousseau, 1989). Extending this definition to the commute, a psychological contract during the commute involves the understanding between individuals that each party (i.e., driver) will follow the traffic rules and respect the other party.

Medin et al. (2005) note that perceptions of psychological contracts are inherently dynamic and sensitive to context, indicating fluctuation. A breach of the psychological contract occurs when one party falls short in fulfilling their (perceived) promised obligations (Robinson & Rousseau, 1994). For the commute, we define a psychological contract breach during the commute as occurring when an individual is perceived to violate the traffic rules or disrespects the other party via actions such as tail-gating or not using a turn signal, for example. Psychological contract breach involves a cognitive appraisal process, as an individual seeks to understand and make sense of a felt discrepancy between an obligation and what was actually delivered. When that felt discrepancy involves an affective or emotional state following the perception of a contract breach, a perceived violation in the psychological contract has occurred (Morrison & Robinson, 1997). Specifically, perceived psychological contract violation refers to the intense feelings of anger and betrayal following the perception of a contract breach (Morrison & Robinson, 1997). Extending this research to the commute context, it is logical to expect that employees who perceive a psychological contract violation during the commute may experience more intense behavioral outcomes compared to those who do not perceive a violation in the psychological contract during the commute.

As stated, AET posits that behavioral responses are associated with negative workplace events and emotions. Weiss and Cropanzano (1996) also state that situational factors may make behavioral responses associated with negative emotions and their preceding negative affective events more or less likely to occur. Perceived psychological contract violation during the commute may be one such situational factor given that it occurs during one's commuting experience. Theoretically, AET suggests that behaviors (i.e., aggressive driving behaviors) resulting from work events (i.e., experienced incivility) and associated affective responses (i.e., negative emotions during the commute) may be more likely to be exhibited under certain situations (i.e., when individuals perceive a psychological contract violation during the commute). Empirically, evidence suggests that situational factors moderate the relationship between emotions and subsequent behavioral responses (Chang et al., 2014). As such,

we propose that perceived psychological contract violations during the commute serve as a contextual commuting factor, which will exacerbate the relationship between experienced incivility, negative emotions during the commute, and aggressive driving behaviors. In other words, if individuals are already in a heightened emotional state while driving and they perceive a psychological contract violation during their commute, they may be more likely to engage in aggressive driving behaviors. Thus, we hypothesize the following:

> Hypothesis 4: Perceived psychological contract violation during the commute will moderate the relationship between negative emotions during the commute and daily aggressive driving behaviors, such that the relationship between negative emotions during the commute, and aggressive driving behaviors will be stronger when employees perceive a psychological contract violation during the work-to-home commute.

Method

Participants

We recruited participants via Amazon's Mechanical Turk (MTurk). MTurk contains a repository of "workers" who complete Human Intelligence Tasks (HITs) for compensation. Only US citizens with a 90% approval rate (meaning out of 100 HITs completed, they were compensated for at least 90), who had previously completed 100 or more tasks, were invited to take the screening survey. In addition, only respondents who were employed full-time (i.e., 35 or more hours per week) and commuted to work via private vehicle alone (i.e., they drove themselves to and from work) were eligible to participate in the current study. Two validation questions were embedded into each survey to ensure effortful responding. No participants failed to respond correctly to both of the validation questions. In all, 608 participants completed a screening survey, of which 153 met the study criteria for eligibility. Of the 153 participants who were sent a baseline survey, 140 participants completed it, with 115 participants completing three or more daily surveys (response rate = 82%), and 96 participants completing all five daily surveys (response rate = 69%).

The majority of participants were white (74%), male (58%), and educated with at least a 4-year college degree (56%). The mean age was 35.6 years, with approximately 54% of participants married or living with a partner. Approximately 62% of participants reported having no children and 60% reported an income of at least $50,000. Participants were employed in a variety of occupations, including: management/business/financial (19%), professional (18%), and office administrative (18%). The average time employed with participants' respective companies was 5.6 years, with 16% of participants reporting a tenure of 10 to 22 years.

Measures

Baseline Survey The baseline survey provided information needed to more fully describe the sample, as well as collect information on stable (trait) characteristics of participants and planned statistical control variables.

A priori control variables Negative affect, driving anger, and trait anger were utilized as control variables. Both driving anger and trait anger are associated with aggressive driving behaviors, while negative affect may influence perceptions of job stress and experienced incivility due to the likelihood of being predisposed to a negative disposition.

Trait negative affect was assessed using five items from the 10-item short form of the Positive and Negative Affect Schedule (PANAS; Thompson, 2007). Items included the stem, "Indicate to what extent you generally feel on average…" An example item is "Nervous." Items were assessed along a 5-point frequency scale ranging from *1* (never) to *5* (very often). Items were coded such that higher scores indicated a greater degree of negative affect. Reliability was assessed via Cronbach's alpha (0.83).

Trait driving anger was assessed with the 14-item short-form of the Driving Anger Scale (DAS; Deffenbacher et al., 1994). The DAS assesses trait-like driving anger in response to situations that represent six dimensions: hostile gestures, illegal driving, police pressure, slow driving, discourtesy, and traffic obstructions. Items included the stem, "Imagine that each of the situations described is actually happening to you. Please rate the amount of anger you feel as provoked by each of the following situations." An example item is, "You are stuck in a traffic jam." Items were assessed along a 5-point response scale ranging from *1* (not at all) to *5* (very much). Items were coded such that higher scores indicated a greater degree of driving anger. Reliability was assessed via Cronbach's alpha (0.92).

Trait anger was assessed with the 10-item trait anger subscale of the State-Trait Anger Scale (STAS; Spielberger et al., 1988). Items included the stem, "Please respond to the following items as they relate to how you generally feel you are." An example item is, "I am quick-tempered." Items were assessed along a 5-point frequency scale ranging from *1* (almost never) to *5* (almost always). Items were coded such that higher scores indicated a greater degree of trait anger. Reliability was assessed via Cronbach's alpha (0.91).

Personal and job demographics Personal demographics included: age, gender, marital status, number of children, primary childcare/dependent-care responsibilities, highest level of education completed, and five-digit home zip-code.

Job demographics included: job title, supervisory status, tenure in organization, opportunity for flextime, opportunity for telework, job status (e.g., full-time), working hours, and five-digit zip-code of work location.

Daily Survey All measures used were originally developed for cross-sectional research and thus, here, were adapted and piloted for daily diary use.[1]

Experienced incivility was assessed using an adapted version of the six-item Workplace Incivility Scale (WIS; Cortina et al., 2001). Items were adapted to include first-person statements and contained the stem, "Today, at work, a colleague or supervisor…" An example, adapted item is, "Put me down or was condescending to me." Items were assessed using an adapted, four-point, Likert-type forced-choice response format ranging from *1* (strongly disagree) to *4* (strongly agree). Items were coded such that higher scores indicated a greater degree of incivility experienced during the workday. Reliabilities were assessed via Cronbach's alpha and ranged from 0.91 to 0.95 across the five days of data collection.

Negative emotions during the commute was assessed using seven items from an adapted version of the negative emotions while driving subscale of the Dula Dangerous Driving Index (DDDI; Dula & Ballard, 2003). The DDDI assesses aggressive, negative emotional, and risky driving behaviors. The negative emotions while driving subscale of the DDDI consists of eight items, however we omitted the item, "Passengers in my car/truck tell me to calm down," because our study criteria indicated that participants must commute by private vehicle alone. We altered the items to be past tense, as well as adapted the stem. An example item is, "I drove when I was angry or upset." Items included the stem, "Today during my commute from work to home…" Responses were assessed via a 5-point frequency format ranging from *1* (never) to *5* (very often). Items were coded such that higher scores indicated a greater degree of negative emotions during the commute on the daily commute from work to home. Reliabilities were assessed via Cronbach's alpha and ranged from 0.85 to 0.92 across the five days of data collection.

Psychological contract violations during the commute was assessed via an adapted version of the four-item psychological contract violation subscale developed for use by Robinson and Morrison (2000). The stem and items were adapted to fit a daily *commuting* context. Items contained the stem, "Today, during my commute from work to home…" An example, adapted item is, "I felt extremely frustrated by how I was treated by other drivers." Items were assessed using an adapted four-point, Likert-type forced-choice response format ranging from *1* (strongly disagree) to *4* (strongly agree). Items were coded such that higher scores indicated a greater degree of perceived psychological contract violation during the daily commute from work to home. Reliabilities were assessed via Cronbach's alpha and ranged from 0.87 to 0.94 across the five days of data collection.[2]

Aggressive Driving Behaviors was assessed using an adapted version of the aggressive driving behaviors subscale of the DDDI (Dula & Ballard, 2003). The aggressive driving behaviors subscale of the DDDI consists of six items. We altered the items to be past tense, as well as adapted the stem. An example, adapted item is, "I flashed my headlights when I was annoyed by another driver." Items included the stem, "Today during my commute from work to home…" Responses were assessed via a 5-point frequency format ranging from *1* (never) to *5* (very often). Items were coded such that higher scores indicated a greater degree of aggressive driving behaviors on the daily commute from work to home. Reliabilities were assessed via Cronbach's alpha and ranged from 0.76 to 0.90 across the five days of data collection.

Commuting demographics for the daily survey included travel speed disruptions, time spent commuting, and distance travelled. Travel speed disruptions were assessed via five items with an adapted stem for daily diary use from Novaco et al. (1990). Participants were asked to indicate whether they experienced disruptions such as heavy traffic by responding either yes or no. Time spent commuting (in minutes) and distance traveled (in miles) were open-ended response questions.

Procedure

Prior to beginning the study, IRB permissions were obtained by the first author. Participants recruited from MTurk were screened in order to ensure they fit the study criteria for participating. All participants who completed the screening survey for participation in the study were given $0.25 and those who met eligibility criteria were invited to take

[1] The full list of adapted items and stems for all measures is available from the first author.

[2] Following recommendations put forth by Colquitt et al. (2019), we assessed the content validity evidence of our psychological contract violations during the commute scale using the Hinkin and Tracey (1999) approach, where we calculated scale- and item-level definitional correspondence and definitional distinctiveness using the orbiting constructs of *aggressive driving behaviors, negative emotions while driving,* and *driving stress.* Results indicated that perceived psychological contract violations during the commute demonstrated both definitional correspondence ($htc = .863$) and definitional distinctiveness ($htd = .28$) compared with the orbiting constructs. Additional information and data associated with the assessment of content validity evidence is available from the first author.

a baseline survey. Email invitations to complete the baseline survey were sent to eligible participants following the screening process with an online link to the baseline survey embedded. The baseline survey was used to collect information on control variables, as well as participant personal, job-related, and commuting-related demographics, and took approximately 30 min to complete. Surveys were linked via participants' MTurk employee ID number, which was requested on all surveys. For completing the baseline survey, participants were paid $10. Participants who completed the baseline survey were invited to participate in the daily diary study. Daily surveys were collected for one working week (Monday through Friday). All communications with participants were managed through CloudResearch (formerly TurkPrime), an online participant-sourcing website which interacts with Amazon's Mechanical Turk to facilitate online research and surveys.

Approximately one week after completing the baseline survey, participants began filling out once-daily surveys after arriving home from their evening commute from work. Presentation of items and measures were randomized each day, such that no one measure preceded another measure across the five days of study. Email reminders containing links to the surveys were sent to participants twice a day (one sent at 6:00 pm Eastern Standard Time to remind participants of their needed survey responses and one sent between 9:00 pm and 10:00 pm Eastern Standard Time to remind participants who had not filled out the daily survey to please do so). Participants were paid $5 per daily survey. Participants who completed all five daily surveys were paid a $10 bonus. Total possible compensation for participation in this study was $45.25. The first author received a pilot grant through the Center for Promotion of Health in the New-England Workplace (CPH-NEW) to fund this research.

Results

Prior to conducting substantive analyses, preliminary analyses were conducted in order to examine the data for any patterns of missingness as well as examine the appropriateness of including additional control variables. No patterns of missing data were noted and the data were assumed to be missing at random (MAR). Furthermore, t-tests were conducted in order to determine if significant differences existed between those participants who completed fewer than three daily surveys and those who completed all five daily surveys. Results indicated no significant differences for participants on: age, race, education, marital status, occupation, or the study variables of interest.

Participant personal and commuting demographic variables (e.g., schedule control, age, gender, travel speed disruptions, commuting distance, and time spent commuting) were examined for their use as covariates in substantive analyses. Zero-order correlational analyses indicated that age and gender should be included in the data models as covariates at level 2 due to significant correlations with the study outcome of interest (i.e., aggressive driving behaviors) across the five days of daily diaries. Prior research (Burch & Barnes-Farrell, 2020) supports the use of travel speed disruptions as a covariate at level 1 (within-person). Examination of zero-order correlational analyses indicated that travel speed disruptions should be included in the data models as a level 1 control due to a pattern of significant correlations with the research variables of interest across the five days of daily diaries, as well as time spent commuting (i.e., time travelled). In addition to a priori specified controls at level 2 (i.e., driving anger, negative affect, and trait anger), the aggregate means for all level 1 substantive variables and age were modeled as controls on the between person level. Please see Table 1 for bivariate correlations, means, and standard deviations.

Given the larger correlations between many of the variables in our study, we examined the convergent and discriminant validity evidence for the constructs of interest. Specifically, the correlation between the following variables were large: travel speed disruptions and negative emotions during the commute ($r = 0.62$); perceived psychological contract violation during the commute and negative emotions during the commute ($r = 0.61$); aggressive driving behaviors and negative emotions during the commute ($r = 0.59$); experienced workplace incivility and perceived psychological contract violation during the commute ($r = 0.53$); and perceived psychological contract violation during the commute and aggressive driving behaviors ($r = 0.52$). Because travel speed disruptions is controlled for in all substantive analyses (i.e., multilevel model, multilevel confirmatory factor analysis), we did not include this variable in our analyses of convergent and discriminant validity given the potential variance predicted in the substantive variables of interest by travel speed disruptions are controlled for in multilevel confirmatory factor analyses and hypothesis testing.

To examine convergent and discriminant validity, we used the Fornell-Larcker (1981) approach, where we calculated the average variance extracted (AVE) for each of the constructs of interest: experienced workplace incivility; negative emotions during the commute, perceived psychological contract violation during the commute, and aggressive driving behaviors. The AVE is a measure of the amount of variance that is captured by a construct in relation to the amount of variance due to measurement error. In general, it is recommended that AVE be no less than 0.50 to demonstrate convergent validity. When the AVE is less than 0.50, it means that the items comprising the construct explain more error than variance. To examine discriminant validity, one can take the square root of the AVE, and this value should be

Table 1 Means, standard deviations, and bivariate correlations

Variable		*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Level 2 (between-person) N = 109																	
1	Age	35.94	9.21	xxx													
2	Gender	xxx	xxx	**0.14**	xxx												
3	Schedule Control	xxx	xxx	0.04	0.01	xxx											
4	Negative Affect	1.61	0.58	−0.08	−0.05	0.05	xxx										
5	Driving Anger	3.01	0.79	**−0.13**	**0.08**	−0.03	**0.16**	xxx									
6	Trait Anger	1.63	0.57	**−0.23**	0.03	−0.04	**0.44**	**0.53**	xxx								
Level 1 (within-person) N = 547																	
7	Time Travelled	26.57	16.94	0.02	0.01	−0.06	0.03	0.08	0.06	xxx							
8	Distance	13.82	10.7	**0.17**	−0.003	0.05	**0.12**	0.01	0.01	0.75	xxx						
9	Travel Speed Disruptions	1.28	1.29	−0.06	**0.10**	−0.01	**0.14**	**0.19**	**0.20**	**0.31**	**0.12**	xxx					
10	Job Stress	2.27	0.50	−0.02	−0.01	0.03	**0.18**	**0.15**	**0.17**	0.08	0.02	**0.33**	xxx				
11	Incivility	1.37	0.56	**−0.11**	**−0.15**	**0.09**	**0.19**	**0.09**	**0.26**	0.05	−0.01	**0.34**	**0.33**	xxx			
12	Negative Emotions	1.49	0.68	**−0.11**	0.07	0.05	**0.17**	**0.24**	**0.35**	**0.16**	0.03	**0.62**	**0.37**	**0.43**	xxx		
13	Psych. Contract Violation	1.52	0.65	−0.06	0.01	−0.002	**0.17**	**0.20**	**0.30**	**0.23**	0.06	**0.50**	**0.37**	**0.53**	**0.61**	xxx	
14	Aggressive Driving Beh	1.17	0.52	**−0.21**	**−0.10**	0.02	**0.18**	**0.18**	**0.43**	**0.13**	−0.01	**0.36**	**0.19**	**0.44**	**0.59**	**0.52**	xxx

Significance of bolded entries reflect $p < .05$

Table 2 Composite reliabilities, average variance extracted (AVE), and square root of the AVE

	Composite reliability	AVE	Sq. root AVE
INC	0.931	0.695	0.834
NED	0.868	0.501	0.708
PCV	0.787	0.698	0.835
ADB	0.846	0.500	0.707

INC experienced workplace incivility; *NED* negation emotions during the commute; *PCV* perceived psychological contract violation during the commute; *ADB* aggressive driving behaviors

greater than the largest correlation of the construct with any other construct of interest. Please see Table 2 for convergent and discriminant validity evidence. Note, all AVE estimates were at 0.50 or above indicating convergent validity. In addition, all discriminant validity estimates (i.e., the square root of the AVE) were larger than the largest correlation between each construct of interest.

Multilevel Confirmatory Factor Analysis

Following recommendations put forth by Gabriel et al. (2019), we conducted a multilevel confirmatory factor analysis (MCFA) to confirm the factor structure of our hypothesized multilevel model. Because nested data are not independent, not necessarily isomorphic, and have multiple covariance matrices, a MCFA is necessary. MCFA decomposes the total sample covariance matrix into two matrices (between and within) to produce the factor structure at each level (Dedrick & Greenbaum, 2011). Individual confirmatory factor analyses (CFA) were also conducted and the results can be found in the Appendix.

Research indicates that with smaller sample sizes, diagonally weighted least squares (DWLS) estimation techniques yield more accurate model results and may eliminate the need to use a parcel technique, particularly with items that may not meet the assumption of normality (e.g., low base rate constructs, such as aggressive driving behaviors; Hox et al., 2010; Sterba, 2019). Therefore, we used a robust DWLS estimator in Mplus 8.5 (Muthén & Muthén, 1998–2012) with 8000 iterations. We first loaded all indicators onto each factor (incivility, 6 items; negative emotions during the commute, 7 items; perceived psychological contract violation during the commute, 4 items; and aggressive driving behaviors, 6 items). Next, we fit a four-factor model in MPlus 8.5 at both the within and between levels, with travel speed disruptions and time travelled modeled as level 1 (within-level) covariates for each latent construct, and driving anger, trait anger, negative affect, age and gender modeled as level 2 (between-level) covariates. For each latent construct at the within- and between- levels, we correlated items that comprised each construct. In addition, we set the residual variances of the factor indicators at the between level to zero. The hypothesized four-factor model fit the data well [χ^2 (456) = 842.78; RMSEA = 0.04; CFI = 0.91; SRMR(within) = 0.06; SRMR(between) = 0.10]. To further confirm discriminant validity among study constructs of interest, we conducted a WALD test on our hypothesized measurement model. A significant WALD test indicates that there is discriminant validity among the study constructs of interest; our results indicated significance [WALD (5) = 159,482.29, $p < 0.001$].

Longitudinal Invariance Testing

We conducted longitudinal invariance testing to ensure that the study constructs of interest were invariant over time given that they were measured each day for five days. Each construct of interest (i.e., incivility, negative emotions during the commute, perceived psychological contract violation during the commute) was examined for configural invariance. Configural invariance estimates whether measures taken at different time points represent the same underlying construct (Ployhart & Vandenburg, 2010). Five days of data are unwieldy for most computer programs, MPlus included, therefore we chose three time-points representing the beginning, middle, and end of the observation period (days one, three, and five) to carry out the invariance testing over time, as recommended by Múthen (2011).

Model fit indices were produced from the level 2 (between person) sample size (i.e., $N = 109$); therefore, incivility and negative emotions during the commute were examined with a DWLS estimation technique given that these constructs are comprised of six and seven items, respectively. Using a DWLS technique may eliminate the need for parceling in studies with small sample sizes (our between-person sample was comprised of 109 individuals; Hox et al., 2010). To test for configural invariance for all study constructs of interest, the intercepts, factor loadings, and residual variances were free to vary, with the factor means fixed at zero for each time point. Standards to determine adequate model fit were used when appropriate (e.g., a non-significant χ^2, CFI and TLI > 0.90, SRMR < 0.08). For perceived psychological contract violations, the initial configural invariance model fit well. The initial model for negative emotions during the commute and incivility fit poorly. However, examination of the modification indices indicated that correlating items within each time point would improve model fit. Results for configural invariance testing are reported in Table 3.

Descriptive Analyses

All descriptive analyses were conducted in SPSS version 24.0 (IBM Corp., 2016). The means, standard deviations,

Table 3 Final configural invariance model fit for constructs

Model	χ^2	df	*p*-value	CFI	TLI	SRMR
PCV	75.68	51	0.01	0.97	0.96	0.04
INC	399.21	128	< .001	0.90	0.84	0.06
NED	362.14	175	< .001	0.90	0.84	0.08

PCV perceived psychological contract violation during the commute; *INC* experienced incivility; *NED* negative emotions during the commute

and correlations for all constructs of interest are reported in Table 1. Correlations are based on composite scores calculated for each construct. As can be seen by reviewing Table 1, daily experienced workplace incivility ($r = 0.44$, $p < 0.01$) was significantly associated with daily aggressive driving behaviors, lending preliminary support for Hypothesis 1. Interestingly, daily time spent commuting (i.e., time travelled, $r = 0.13$, $p < 0.01$) was significantly associated with aggressive driving behaviors, however, distance travelled was not correlated significantly with aggressive driving behaviors on a daily basis. Furthermore, the a priori statistical control variables (i.e., driving anger, negative affect, and trait anger) showed a somewhat consistent pattern of significant correlations with the study outcomes of interest.

Tests of Hypotheses

Multilevel random coefficient modeling (MRCM) was utilized to test hypotheses due to the hierarchical nature of the data. Daily observations were nested within people (level 1 N = 547; level 2 N = 109). Variables included in the models were modeled as fixed effects. To examine Hypothesis 3, Preacher et al.'s (2011) approach was used to estimate a 1–1-1 mediation in multilevel modeling which reduces the bias that results from conflation of between- and within- person effects and produces better confidence interval coverage.

Prior to conducting analyses using MPlus 8.5 (Muthén & Muthén, 1998–2012), an unconditional model (intercepts only) was estimated for aggressive driving behaviors so that partitions of the total variance into variability at level 1 (day level) and level 2 (person-level) could be assessed. The unconditional model for aggressive driving behaviors yielded significant ICC(1) = 0.53 and ICC(2) = 0.85 values at $p < 0.001$, indicating that observations within subjects are not independent and warrant the use of MRCM. Additionally, partitioning of the variance into variability at level 1 (46%) and level 2 (54%) was done. This indicates that there is sufficient variability from both the within- and between-parts of the model to warrant examination of substantive predictors. Moreover, because mediation is hypothesized, following recommendations put forth by Mathieu and Taylor (2007), the ICC(1) and ICC(2) values were examined for negative emotions during the commute. Negative emotions during the commute exhibited sufficient between (54%) and within (46%) person variance. Additionally, the ICC(1) = 0.52 and ICC(2) = 0.84 values were significant ($p < 0.001$), again indicating that observations within subjects are not independent and thus warrant MRCM.

We examined all hypotheses simultaneously in one multilevel path model, with all substantive variables of interest treated as continuous. Table 4 presents the results of our hypothesized path model, and Fig. 2 presents these results pictorially. The control variables (i.e., travel speed disruptions and time spent commuting) and the substantive predictor and mediator variables (i.e., experienced incivility, and negative emotions during the commute) at level 1 were person-mean centered. When variables are person-mean centered, the variance in the intercept term represents the within person variance in the outcome variable. In other words, person-mean centering reflects within-person variability only (Hofmann & Gavin, 1998). For example, within-person centered experienced incivility scores indicate whether individuals experienced more or less incivility than what they feel on average, representing daily fluctuations for that individual over time. The aggregate means for all level 1 substantive variables were modeled on the between-person level, or level 2. Doing this allows the within- and between-person variances to be partitioned cleanly and allows for the examination of the effects of daily fluctuations controlling for average experiences across individuals. The models tested were conditional, or random-intercepts models. Random-intercepts models indicate that there are mean-level differences between level 2 units (i.e., individuals) among the variables of interest.

Hypothesis 1 stated that daily experienced workplace incivility would be significantly associated with daily aggressive driving behaviors. Results indicate support for Hypothesis 1, suggesting that on days when employees' experienced more workplace incivility, they engaged in more aggressive driving behaviors ($\beta = 0.07$, $p = 0.04$). Hypothesis 2 posited that daily experienced workplace incivility would be associated with more negative emotions during the commute. Results indicate support Hypothesis 2 ($\beta = 0.27$, $p < 0.001$), suggesting that on days when employees experienced more uncivil experiences at work, they also experienced more negative emotions during the commute.

Hypothesis 3 predicted that negative emotions during the commute would mediate the relationship between daily

Table 4 Simultaneous multilevel path analysis results

		Aggressive driving behaviors					Negative emotions during the commute				
Variables		β		SE	R^2		β		SE	R^2	
Level 1											
Controls	TSD	−0.01		0.03							
	Time Travelled	−0.03		0.02							
Effects	Job Stress	0.03		0.02			0.24	***	0.04		
	Incivility	0.07	*	0.04			0.24	***	0.06		
	NED	0.19	***	0.06							
	NEDxPCV	0.14	**	0.05							
					0.10	**				0.13	***
Level 2											
Controls	Driving Anger	−0.11		0.10							
	Negative Affect	−0.02		0.09							
	Trait Anger	0.43	**	0.14							
	Age	−0.16	**	0.06							
	Gender	−0.09		0.06							

$p < .05$*; $p < .01$**; $p < .001$***; *TSD* travel speed disruptions; *NED* negative emotions during the commute; *PCV* perceived psychological contract violation during the commute; *NEDxPCV* interaction of negative emotions during the commute and perceived psychological contract violation during the commute

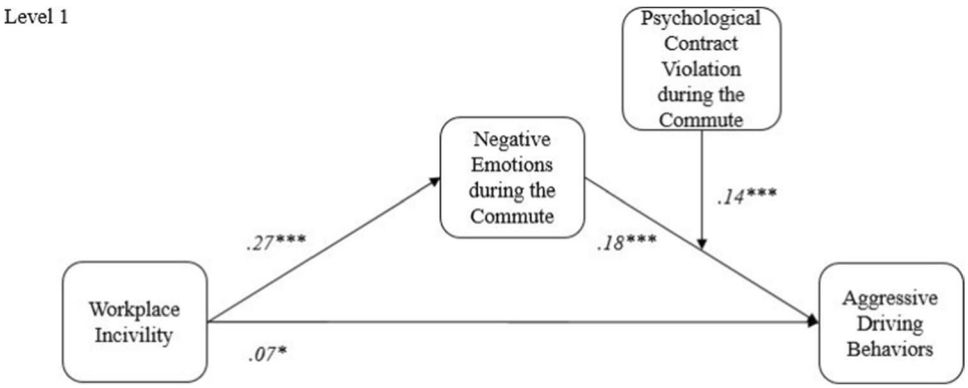

Fig. 2 Multilevel path model results. Control variables at level 1 and level 2 omitted for parsimony. Table 3 reports the full model as tested

experienced workplace incivility and daily aggressive driving behaviors. Results indicate the indirect effect of daily experienced workplace incivility on daily aggressive driving behaviors via negative emotions during the commute was 0.07 and significant (95% CI [0.03, 0.10]). Indirect effects of mediation analyses are often not normally distributed, thus Bauer et al. (2006) suggest the indirect effects of mediation analyses be examined via Bayes Credibility Intervals (Bayes CI). Bayes CI at the 5th and 95th percentile indicate support for Hypothesis 3 (0.05, 0.09).

Hypothesis 4 posited that perceived psychological contract violations during the commute would moderate the hypothesized mediated relationship. Prior to examining the moderating effects, variables at level 1 were person-mean centered and interaction terms were created. In addition, level 1 controls (i.e., travel speed disruptions, time spent commuting) were person-mean centered and level 2 controls (i.e., driving anger, negative affect, trait anger, aggregate means of substantive variables) were grand-mean centered, with the exception of age and gender. Results indicate support for the interaction of perceived psychological contract violations during the commute and negative emotions during the commute on daily aggressive driving behaviors ($\beta = 0.14$, $p < 0.001$).

In order to understand the nature of the interaction, we used Preacher et al.'s (2006) tool for calculating the simple slopes for 2-way interactions with multilevel modeling. Results indicate that the slopes are significant at both the lower bound ($t = -2.23$, $p < 0.05$), and upper bound ($t = 2.22$, $p < 0.05$). Results indicate that employees engage in significantly more aggressive driving behaviors on days when they experience more negative emotions during the commute and perceive a psychological contract

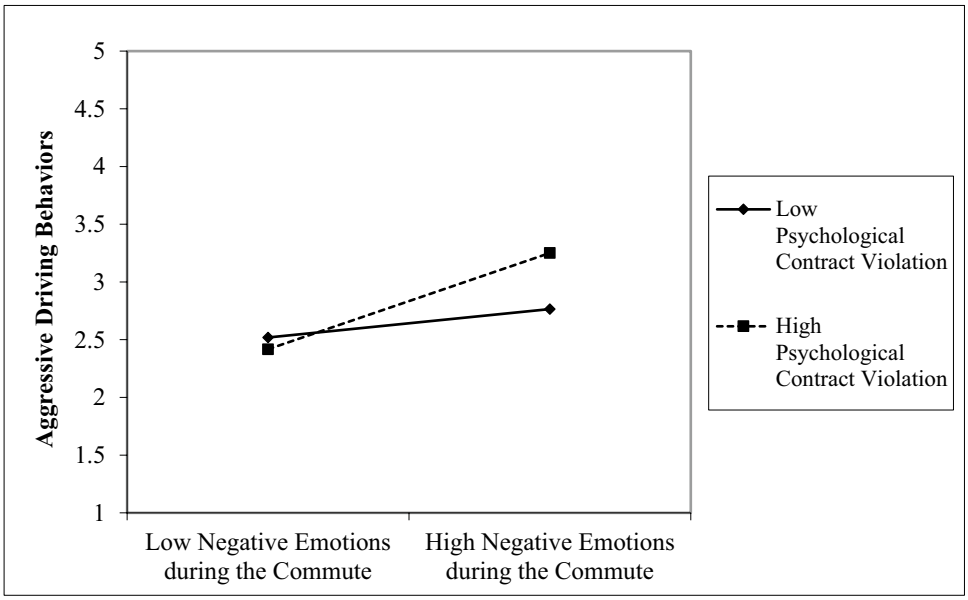

Fig. 3 Interaction of negative emotions during the commute and perceived psychological contract violation during the commute on daily aggressive driving behaviors

violation during the commute. Figure 3 displays a plot of the interaction.

The overall model accounted for 7% of the observed variance in daily negative emotions during the commute, and 12% of the observed variance in daily aggressive driving behaviors.

Discussion

We sought to examine the influence of experienced workplace incivility on employees' daily aggressive driving behaviors, as well as understand the mechanisms and conditional factors that transmit the spillover of workplace incivility into the commute to impact employees' driving behaviors using AET as a theoretical lens. We accomplished this through the use of daily diary methodology to understand the dynamics of these relationships. We explored the influence that daily experienced workplace incivility can have on employee's aggressive driving behaviors during the work-to-home commute via negative emotions during the commute, with perceived psychological contract violations during the commute serving as a conditional factor for engaging in such behaviors. While past research has examined factors that influence aggressive driving behaviors, much of this past research has focused on *who* the driver is rather than on *why* people engage in aggressive driving behaviors (e.g., Shinar, 1998). Furthermore, as stated, employees as a class of drivers commuting between work and home are an ignored population in the aggressive driving literature.

We found support for all hypothesized relationships. Results indicate that on days when employees experience more incivility in the workplace, they engage in more aggressive driving behaviors during their work-to-home commutes via the influence that these negative work experiences have on their negative emotions during the commute. Furthermore, the propensity to engage in more aggressive driving behaviors during the work-to-home commute is greater on days when employees experience negative emotions during their commutes and also perceive a psychological contract violation during the commute. This could indicate that employees are more likely to engage in aggressive driving behaviors when they perceive a violation in the psychological contract during the commute has been committed and they are already in a heightened negative emotional state during their commute time.

Theoretical Implications

Utilizing and extending AET as our primary theoretical lens, our results support the influence of experienced workplace incivility on employees' aggressive driving behaviors during the work-to-home commute. Rather than focus on the *who* of aggressive driving behaviors, this study was a response to researchers who have called for a focus on the *why* and *when*, specifically, a focus on the contextual factors that predisposes a class of drivers (i.e., employees) to engage in aggressive driving behaviors. Moreover, this study supports the notion that spillover not only occurs between work and home, but also impacts the *transition* between the work and non-work domains. In other words, this research contributes to a small, but growing body of evidence that work influences employees' behavior *outside* the workplace, specifically during the commute (i.e., Burch & Barnes-Farrell, 2020; Turgeman-Lupo & Biron, 2017). Not only that, this study expands affective events theory suggesting that

affect driven behaviors (i.e., engaging in aggressive driving behaviors) are not bounded to the work domain, but rather the theoretical underlying process extends to the commute. Specifically, our research provides evidence that suggests that negative work events, such as experienced incivility, are associated with negative emotional responses while driving, which in turn is associated with aggressive driving behaviors (i.e., affect driven behaviors), supporting and extending AET. It could be that the commute may be a more appropriate outlet for negative emotions and affect-driven behaviors over the workplace however the spillover of workplace experiences into the commute has the potential to be disastrous if it contributes to vehicular accidents.

Furthermore, the present research builds on psychological contract theory through the application and extension of psychological contracts to employees' commutes. Psychological contracts have been primarily discussed in the employment literature for decades, however the concept of the psychological contract is rooted in the notion of social exchange relationships, which aren't unique to the employment situation (Cullinane & Dunden, 2006). Cullinane and Dunden (2006) note that the concept of the psychological contract has the potential to shed light on neglected micro and socio-cognitive processes that take place between individuals. Researchers (Galovski et al., 2006) have noted that individuals engage in aggressive driving behaviors even though they may lack the dispositional characteristics (i.e., driving anger, trait anger) that have been traditionally focused on in the aggressive driving literature. As such, the extension of psychological contract theory in the present study to the commute has the potential to influence researchers in thinking about the mechanisms and conditional factors that may predispose an individual to engage in aggressive driving behaviors.

Strengths and Limitations

The current study has a number of important strengths, including the examination of an overlooked aspect in the work-life and aggressive driving literatures, namely that work influences aggressive driving behaviors. The collection of data on variables of interest on the same days they occur minimizes retrospective bias and error that can occur at the interindividual level and also allows for the modeling of dynamic psychological phenomena. What's more, Feldman and Lynch, Jr. (1998) notes that the content of preceding questions on surveys and their ordering can affect observed relationships among measured constructs of interest. Given this knowledge, we randomized the order of questions and items on each daily survey so that no one construct preceded another across all five days of measurement, limiting order effects in the relationships of interest. Last, in response to the call from researchers (Galovski et al., 2006) for more precision in assessing aggressive driving behaviors, we utilized adapted, previously validated self-report instruments, and sampled over a different driving time period (i.e., daily).

In addition, while some question the use of Mturk as a source of participant recruitment, research suggests that Mturk is a practical and feasible source of participants for organizational and occupational health research (Michel et al., 2018). Furthermore, many of the recommendations for Mturk research put forth by Cheung et al. (2017) were adhered to in our study. For example, Cheung et al. (2017) note that in order to address subject inattentiveness, researchers should detect and screen inattentive responses (see "Method" section). Cheung et al. (2017) also note that to address repeated participation issues, researchers should screen data and use custom qualifications (see "Method" section). Moreover, to ensure our Mturk sample was indeed commuting to and from work on a daily basis, we were able to obtain GPS records confirming work-to-home commutes for a selected one-third of the sample (Cheung et al., 2017).

Despite the strengths in the current study, there are limitations. First, we did not assess other potential influences on aggressive driving behaviors (e.g., hostility, dysfunctional impulsivity, sensation-seeking, negative emotions during the workday) which may or may not influence the hypothesized relationships. Furthermore, all constructs (i.e., antecedent, mediator, moderator, and outcome) were measured each day during each survey, making the ability to support causal inference impossible due to the lack of temporal separation. Temporal separation of constructs is necessary for determining the directionality of the relationships hypothesized. Because the bulk of the data is self-report, there may also be the potential that participants were not entirely truthful in their responding, potentially impacting the validity of the study. Moreover, our sample lacked diversity (e.g., ethnic, working status (part-time, gig economy)), which is not representative of the US commuting population at large.

Another potential limitation is that because data collected solely relied on self-report, there is the possibility that common method bias may be present. Common method bias (i.e., using one method to collect all data of interest) may result in inflated correlations between constructs, thus biasing the estimates obtained. We used Harman's One-Factor Test to assess whether common method bias was a problem for our data; if the total variance extracted by one factor exceeds 50%, then common method bias may be a problem. Results indicated that when all items are loaded onto one underlying factor, 41.71% of the variance was explained, supporting the reduced probability that common method bias is artificially inflating our results. However, the Harman's One-Factor approach has received criticism (Richardson et al., 2009), therefore we sought to further examine the potential for common method bias using recommendations from Podsakoff et al. (2003).

According to Podsakoff et al.'s (2003) recommended remedies for common method bias, situation four applies to our research (p. 898). Specifically, we separated measurement of the predictor and criterion variables psychologically, in that we asked participants to report on their work experiences (i.e., experienced workplace incivility) and their commuting experiences (e.g., aggressive driving behaviors), priming participants through each items' adapted stem (e.g., Today, at ***work***…; Today, during my ***commute***…). In addition, Podsakoff et al. (2003) recommends that the single-common-method-factor approach be used in assessing the potential for common method bias as noted in situation four (p. 898). Therefore, we tested a measurement model where all items in each factor loaded onto an underlying latent factor to denote common method variance. The chi-square difference test resulted in $\chi^2_{\text{Difference}} = 27.98$, with a $df_{\text{Difference}} = 60$, which was not significant, therefore results favored the measurement model with no common method variance factor, lending further support to the assumption that the results of our research were not inflated due to common method bias.

In addition, as noted by reviewers, many of the constructs of interest had low overall daily means, indicating that these experiences seemed to happen infrequently. For example, the minimum mean rating across all participants on aggressive driving behaviors was $M = 1$ across all five days of measurement. However, the maximum mean rating across all participants on aggressive driving behaviors was $M = 4$ across all five days of measurement. It could be that the low mean ratings for the study constructs of interest indicate that these phenomena (e.g., experienced daily workplace incivility, negative emotions during the commute, and psychological contract violation during the commute) are low base-rate phenomena but, when they occur, it creates the perfect storm of contextual factors that influence employees' aggressive driving behaviors. Power analyses prior to data collection via Optimal Design indicated that the power to detect a small effect (0.80) with repeated measures and five measurement occasions would be achieved at a between person sample size of $N = 38$; as our sample included $N = 96$ individuals who completed all 5 days of daily observations, Optimal Design indicated we had a power of 0.95, more than enough to detect associations between seemingly low-base rate phenomena.

Furthermore, there is the possibility of a "lag problem" between the relationships of interest. In other words, the lagged relationships between experienced incivility and negative emotions during the commute, for example, is dependent on the interval used to assess these constructs (Hamaker & Wichers, 2017). Just because we measured each construct every day does not mean that the variables exert an influence on each other only at this interval. For example, if employees do not engage in recovery in-between work periods, experienced incivility (as a stressor) has the potential to keep building, with the possibility of exerting a cumulative and non-linear effect on negative emotions if that experienced incivility is unrelieved via recovery (individual) mechanisms and organizational intervention. On the other hand, our focus was more on the immediate effects of emotions on in-the-moment behaviors (i.e., aggressive driving behaviors).

Finally, as evidence by Table 1, and elaborated on prior, many of the constructs in our study were highly correlated with other constructs of interest and/or control variables. While we cannot rule out that perceived psychological contract violation during the commute predicts daily aggressive driving behaviors, or that daily travel speed disruptions may predict negative emotions during the commute given strong correlations between the aforementioned, we statistically controlled for travel speed disruptions in all measurement models and substantive hypothesis testing. In addition, we controlled for the direct effects of the moderating variable (perceived psychological contract violations during the commute) on the outcome variable of interest (daily aggressive driving behaviors) as is appropriate with regression techniques. While we cannot definitively say that perceived psychological contract violations does not predict negative emotions during the commute, nor that travel speed disruptions may predict negative emotions during the commute, these may be questions to address in future research with the appropriate theoretical justifications for doing so.

Future Research

Given the limitations of the current study, future research could benefit from determining the temporal ordering of constructs in order to better determine directionality. This could be accomplished through the utilization of a lagged design, whereby information about the mediating relationship is collected in a temporal sequence. For example, work-related experiences could be collected at work, prior to commuting home, skin conductance could be utilized to assess emotion (heightened negative emotional states are associated with greater conductance), while objective indicators of driving behaviors could be assessed via a mobile application. This would represent an essential step in moving from prediction and description to a causal interpretation of within-person relationships.

Methodologically, researchers have called for more precision in aggressive driving behavior research (Galovski et al., 2006). Indeed, it has been noted that research should make use of direct observation and validated self-report instrumentation in the study of aggressive driving behaviors. Furthermore, Galovski et al. (2006) called for the sampling of different driving time periods, noting a lack of research examining daily aggressive driving behaviors.

Aggressive driving behaviors are likely to fluctuate on a daily basis and may change due to environmental and contextual circumstances. Therefore, the examination of aggressive driving behaviors is needed that uses methods that are appropriate to capture the dynamic nature of aggressive driving behaviors.

Future research should also seek to more fully understand and develop the construct of aggressive driving behaviors. This can be accomplished through the use of daily diary or episodic sampling methodology whereby aggressive driving behaviors are assessed via objective- and survey- based methods that also includes a line of questioning that taps into the motivation to engage in such behaviors. Importantly, do people who engage in aggressive driving behaviors *intend* to do so? Is there prior cognition to support the intention in the choice of behaviors?

While our research supports an understanding of contextual factors that influence aggressive driving behaviors in employees commuting from work-to-home, there are likely other work-related variables that influence behaviors during the commute. For example, abusive supervision may influence aggressive driving behaviors in employees commuting between work and home. Prior research supports the influence of abusive supervision on employees' commuting safety behaviors (Turgeman-Lupo & Biron, 2017). Indeed, given the evidence that experienced workplace incivility influences aggressive driving behaviors, it is logical to expect that experiencing abusive supervision in the workplace may elicit a similar pattern of effects. Unfortunately, the incivility measure used in the present study did not differentiate incivility based on work source. Future research should seek to understand other workplace attitudes and experiences that elicit effects on the behaviors employees engage in during the commute.

Furthermore, there are other possible mechanisms that could facilitate the spillover of work into the commute to impact behaviors. For example, if employees are experiencing incivility during the workday, it could be that these experiences influence the propensity to engage in work-related rumination. Engaging in work-related rumination that originates from experiences in the workplace may facilitate the spillover of emotions into the commute, thus impacting subsequent behavioral responses. Future research could benefit from exploring other mechanisms that facilitate spillover into employees' commutes.

Similarly, it could be that perceiving a psychological contract violation during the commute influences rumination during the commute. As stated, psychological contract violation during the commute is an intense emotional response to the perception that a psychological contract during the commute has been breached. If one perceives that a psychological contract violation during the commute has occurred, they may be more likely to ruminate about the experience after arriving home, potentially impacting one's at-home mood and ability to engage in recovery processes.

Moreover, we only examined one direction of the commute for employees, the work-to-home commute. However, similar patterns of relationships may be evident for employees engaging in the home-to-work commute. It is likely that home-based attitudes and experiences spillover into the home-to-work commute for employees impacting aggressive driving behaviors, and subsequent workplace attitudes and experiences. Prior research has found that strain experienced during the morning commute has a negative impact on employees' self-regulation at work, and that family strain exacerbates this effect (Zhou et al., 2017). Therefore, it is logical to expect that family strain may spillover to impact aggressive driving behaviors during the home-to-work commute, which may further elicit effects during the workday.

Practical Implications

This study points to the impact that daily job experiences can have on one's behaviors during the commute, with the potential for detrimental consequences. Indeed, employees engaging in aggressive driving behaviors during their commutes are at an increased risk of accidents, which may result in injury, or worse, fatality. Thus, engaging in aggressive driving behaviors may not only impact employees and their families but also impact their organizations, which could see an increase in healthcare costs as well as lost productivity and absenteeism. Importantly, our research demonstrates that the spillover effects of aggressive driving can have a potential impact on public health. Unfortunately, aggressive driving is a common phenomenon in the USA. The AAA Foundation for Traffic Safety (2009) report indicated that 78% of US drivers report having engaged in at least one aggressive driving behavior in the past year; and nine out of 10 individuals believe that a serious threat to their personal safety are aggressive drivers. While not all car accidents are caused by aggressive driving, car accidents do rank as a leading cause of death in the USA for those aged 1–54 (CDC, 2020). Aggressive driving, and by extension experienced workplace incivility, should be considered a public health concern, and research to determine the causes of aggressive driving, as well as the amelioration of uncivil work environments, are beneficial to the health and safety of the public at large.

It has been noted despite government legislation and organizational policies to promote respectful workplaces, incivility remains a frequent occurrence in the workplace. Thus, organizations should seek to limit tolerance of uncivil behaviors. There are a number of ways to accomplish the aforementioned. Research suggests that an environment that emphasizes positive norms for civility is associated with lower supervisor- and coworker- enacted incivility four months later (Walsh et al.,

2012). Furthermore, perceptions of emotional and organizational job support buffer the effect of incivility on mental and physical health outcomes (Miner et al., 2012). Therefore, creating an environment that emphasizes intolerance of uncivil behaviors is necessary to any organization's health and employee functioning.

The determination that experienced workplace incivility is associated with employees' aggressive driving behaviors is the first step in designing interventions efforts aimed at reducing this phenomenon. An intervention technique that shows promise is in building positive resources of employees. Research supports that engaging in positive reflection of daily experiences at work leads to reduced stress and improved health of employees (Bono et al., 2013). If employees were given the opportunity to positively reflect on their workday prior to leaving their places of employment, this could lead to a reduction in the likelihood of carrying negative emotions originating from uncivil workplace experiences into the commute, as well as potentially reduce the negative emotions experienced during the commute.

Furthermore, research suggests that team-based interventions reduce supervisor-perpetrated incivility, improving work outcomes for employees (Leiter et al., 2011, 2012; Spence Laschinger et al., 2012). The Civility, Respect, and Engagement in the Workforce (CREW) intervention technique is aimed at increasing civility in the workplace through employee-participatory approaches in identifying strengths and weaknesses regarding civil workplace behaviors and designing and implementing intervention efforts to curb uncivil behaviors (Osatuke et al., 2009). The CREW technique shows promise in helping organizations to create norms around civility and improve the culture around civility in the workplace.

Finally, individuals who tend to consider the consequences of their actions while driving and forgive other drivers are associated with having reduced risk while driving (Moore & Dahlen, 2008). Driving education programs may find it beneficial to include strategies that help drivers' accuracy with the appraisal of consequences while driving, which has the potential to help individuals with negative emotions they may experience during their commutes. Offering strategies for drivers to control their anger and forgive other drivers during their commuting experiences may be a consideration of driving education programs and interventions that may help the public at large given the notion that negative emotions during the commute precedes aggressive driving according to our research.

Conclusion

Research in the work-life interface has largely ignored the commute as a place and time in which work experiences, attitudes, and behaviors can elicit detrimental effects. However, there is a small, but growing body of evidence that emphasizes this transition time should not be neglected, and that indeed work impacts behaviors of employees during the commute, often in detrimental ways, and through a variety of pathways (Calderwood & Mitropoulos, 2021). Given the evidence produced by the present study, aggressive driving behaviors should be classified as a risk factor associated with daily experienced incivility in the workplace due to its impact on negative emotions during the commute. Furthermore, perceived psychological contract violations during the commute can exacerbate the aforementioned effect. Importantly, the nature of how work attitudes, behaviors, and experiences can impact employees both in and outside the workplace appears to be crucial to our understanding of how to assist organizations interested in helping their employees lead healthier, safer lives.

Appendix 1

We conducted single-level confirmatory factor analyses (CFA) on all substantive study variables of interest using the first day of daily diary data. All study variables were assessed via continuous scales and have been validated in previous research.

First, we examined the factor structure of aggressive driving behaviors, loading six items onto a latent aggressive driving variable. This model yielded a solution with poor fit [χ^2 (9) = 53.58, $p < 0.001$; CFI = 0.88; TLI = 0.81; SRMR = 0.08]. Factor loadings on the aggressive driving variable were sufficient (i.e., all items loaded > 0.55), however examination of the modification indices indicated that model fit would be greatly improved by correlating item four (*I deliberately used my car/truck to block drivers who tailgated me*) and item six (*I punished someone who cut me off*). Both item four and item six appeared to capture a deliberate punishment component, therefore it was logical to correlate these two items. Indeed, correlating the aforementioned items improved model fit [χ^2 (8) = 12.67, $p = 0.12$; CFI = 0.98; TLI = 0.98; SRMR = 0.03].

Furthermore, we confirmed the factor structure of negative emotions during the commute, loading seven items onto latent negative emotions during the commute variable. This model yielded adequate fit (χ^2 (14) = 39.08, $p < 0.001$; CFI = 0.93; TLI = 0.89; SRMR = 0.06). We also confirmed the factor structure of perceived psychological contract violations during the commute and experienced incivility. The CFA for perceived psychological contract violations during the commute yielded a solution with good fit (χ^2 (2) = 2.09, $p = 0.35$; CFI = 1.00; TLI = 0.99; SRMR = 0.02). The CFA for incivility yielded a solution with adequate fit (χ^2 (9) = 24.68, $p = 0.003$; CFI = 0.96; TLI = 0.93; SRMR = 0.03).

Data Availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of Interest We have no conflicts of interest to disclose. Portions of this research were previously presented at the 34th Annual Society for Industrial and Organizational Psychology (SIOP) conference. Specifically, the methodology was presented in a panel session on work-family research methodology. This study was supported by the CPH-NEW pilot grant program, funded by Grant Number 1 U19 OH008857 from the US National Institute for Occupational Safety and Health (NIOSH). Its contents are solely the responsibility of the author and do not necessarily represent the official views of NIOSH.

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