INDIVIDUAL DIFFERENCES AND THEIR IMPACT ON RESPONSES TO IMMEDIATE VERSUS NEGOTIATED NOTIFICATION IN A SIMULATED DRIVING TASK

by

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ABSTRACT

Title: Individual differences and their impact on responses to immediate versus negotiated notification in a simulated driving task

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The extent to which responding to interruptions affects driving performance is moderated by personal variables. The effects of different notification styles were investigated by interrupting participants engaged in a driving simulator task. Negotiated interruptions yielded better interruption-related performance. Field dependents (FD) answered the ringing or beeping more quickly and math questions, more slowly. FDs were more reactive in their driving responses to interruptions. Those high in desire for control (DfC) answered ringing and math questions more quickly and accurately. The high DfC group was aggressive in terms of throttle usage and lane changes. Those with large working memories answered ringing and math questions quickly while maintaining responsive throttle usage and lower heading error. The implication of these results is that in-vehicle audio displays can, in principle, be tailored to individual ability profiles to improve driving performance.

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1. INTRODUCTION

Motivation

Driving is a task in which minor fluctuations of attention result in important performance impacts (sometimes leading to crashes). It is a task that demands constant vigilance and readiness to react. As usage of personal technologies such as PDAs and cellphone grows, the impact of notifications on driving performance becomes a critical issue.

In this research, some potentially relevant individual differences are explored in order to identify which characteristics predict performance and preferences regarding interruptions while driving. This study is narrowly focused in the sense that preferences and performance in and around the interruption are examined. The interruption is an isolated instance of information transfer, where information is 'pushed' to the individual. A dual primary-secondary task paradigm is used in order to assess the cost of engaging in an interruption task (secondary task).

The research reported in this thesis uses driving as a continuous primary task with varying degrees of difficulty depending on road conditions. Performance decrements in the primary task when engaged in the secondary task are viewed as being caused by shifting attentional resources to the secondary task (and away from the primary task). In

order to motivate operators to answer interruptions, they are followed by mathematical questions that, when answered correctly, provide financial remuneration.
In the case of real time, and mission-critical task such as driving, it is essential that interruptions do not degrade performance on the primary driving task to the point where it becomes unsafe. Research is needed to determine when interruptions are safe and when they are not. In particular our interest will be on whether there are individual differences which affect how damaging to driving performance particular types of interruption are for particular types of individual.

One individual difference that may be relevant in this context has been labeled "desire for control". It seems likely that individuals who tend to act in a goal-driven manner (having higher desire for control) would prefer to 'pull' information to themselves, and those individuals that tend towards data-driven style would prefer that information be 'pushed' towards them. It is an open question however as to whether those who have higher desire for control will handle interruptions better (by exerting greater control over them and not responding to them as impulsively) or worse (because the combined effect of the interruptions and the driving tasks overwhelm the executive processes that would normally be used to exert control over task performance). This research aims to address this question and to establish how, if at all, desire for control modifies the impact of interruptions on driving performance.

More generally, the purpose of the research reported in this thesis was to predict how people, with goal-driven style or data-driven styles, and with particular levels of cognitive abilities likely to affect efficiency of information processing, react to information that is pushed, or can be pulled, towards them. Assessing reactions to different types of notifications in a driving task is used to explore this research problem, focusing on the set of research questions listed below.

Research Questions:

- How do individual differences affect preferences and performance during responses to interruptions while driving?
- How does the type of interruption affect the impact on preferences and performance?
- How do the various individual differences interact with type of interruption and driving task complexity in affecting driving performance?
- Are there identifiable strategies (e.g., not answering in particular driving conditions) that lead to better overall performance of the driving and interruption tasks?
- Does high desire for control lead to better maintenance of good driving performance in the face of interruptions?

Road Map of the Thesis

Relevant research literature on individual differences that affect performance and preferences surrounding interruptions and attention is reviewed, and opportunities for addressing new research questions relating to this topic are identified. Hypotheses are then constructed with respect to the relevant variables, based on the findings and implications identified from the literature review. An experimental study is then conducted that assesses 1) operators' individual differences, 2) driving performance during interruptions (primary task) and 3) performance and preferences surrounding responding to interruptions (secondary task). Driving performance, and interruption handling strategies observed during the experiment are analyzed in terms of how they are affected by levels on a number of individual difference variables, including Desire for Control. In order to increase the generalizability of the results, a number of different types of interruption are used in the study. The results are then interpreted in terms of their implications for driving safety in general and for guidelines concerning the safe use of interruptions while driving.

2. LITERATURE REVIEW

This chapter begins with a review of literature concerning how individual differences in control and cognitive style affect how people respond to and process information. Information processing in different tasks relies on attention, and thus research on different types of attention in general, and dual task contexts in particular, is also reviewed. Given the interests of this thesis, there is a particular focus on the relationship between attention and interruptions. The literature review then concludes with a discussion of how individual differences moderate the impact of interruptions.

Cognitive Processing of Information

Driving is a task that requires high levels of awareness of the current situation, including factors such as the position, velocity, heading, and intentions of nearby traffic. Situation awareness (SA) is a topic that has been studied extensively with respect to aviation, but that is also highly relevant in driving. Situation Awareness has been defined generally as a person's awareness of information surrounding the focal point of attention, in other words, peripheral data. In treating the problems of information overload, Endsley (2001) discussed how to help the user gain greater SA by 1) supporting users' goal-driven focalizing and 2) having certain objects or attributes present to activate other goals. When environmental cues activate goals, the goals are considered to be data-driven. For example, interfaces that give users navigational control will allow them to direct their attention (in a goal-driven manner, or top-down processing) while certain warnings may be displayed which would attract their attention (data-driven, or bottom-up processing). In her article, Endsley briefly discusses how the distinction between top-down and bottom-up processing affects the search process. In top-down processing, a person chooses which aspects of the environment are attended to, whereas in bottom-up processing, the patterns in the environment drive orientation and attention (Casson, 1983). Research in hypertext and information seeking has characterized similar strategies for finding information: goal-based versus being influenced by cues on the interface (Bodner et al, 2001; Marchionini, 1995; Bates, 1989, 1990). One model relating goal-driven information seeking vs. data-driven ('push') interfaces has been described by Choo, Detlor, & Turnbull (2000). Further research is needed to apply the distinction between goal-driven and data driven process to other tasks, including information presentation and use during driving.

Individual Differences

In this section I introduce individual differences in abilities, personalities and styles as moderating variables that may affect how interruptions are handled.

Cognitive Style

Cognitive style is generally characterized as the manner in which a person moves towards a goal, in terms of information organization and processing (Goldstein & Blackman, 1978). Cognitive style can be measured through several different instruments, including: field dependence/independence, breadth of categorizing, conceptualizing styles, cognitive complexity/simplicity, and constructed/flexible control (Martens, 1975). Field dependence/independence and its relationship to information-processing is of particular interest to this thesis and will be explored in the remainder of this section.

Witkin et al. (1977) characterized field dependence/independence in terms of observed learning patterns. They found that field-independents (1) make greater use of cognitive processes such as analyzing and structuring, (2) adopt an active, hypothesis-testing role in learning, (3) are less influenced by the most obvious or salient cues in learning, and (4) operate more from internally defined goals and reinforcements and thus are more likely to be motivated by intrinsic or task-oriented forms of motivation. In contrast, field-dependents (1) make less effective use of mediational cognitive processes, (2) adopt a passive, spectator role in learning, (3) are more dominated by salient cues in learning, and (4) are better at learning and remembering information having social relevance or content. Field dependence is measured by the Group Embedded Figures Test (GEFT) which scores participants on their ability to isolate a simple pattern within a complex pattern. Goodenough (1976) describes the alternate advantages of cognitive style: field dependents (FD) perform well in situations when the most salient cues are the most relevant cues for a solution and field independents (FI) perform better when the less salient cues are more relevant.

FI individuals are better able to isolate and encode essential elements of memory tasks (Davis & Frank, 1979; Bennink & Spoelstra, 1979; Reardon & Rosen, 1984). In memory and learning tasks, FDs remember more contextual details of memory stimuli (Durso, Reardon & Jolly, 1985) and were found to be more easily distracted (Konstadt & Forman, 1965).

Control

A second individual difference variable of interest in this thesis refers to people's attitudes towards being in control. The construct of personal control is concerned with whether a person believes to be, or wishes to be, self-directed or directed by others. Control can be measured by various somewhat overlapping sub-concepts: locus of control, self-efficacy and Desire for Control.

Locus of Control (Rotter, 1966) refers to an individual's process of attribution. Those with an internal locus of control think that their actions impact events, and that they are generally in control of outcomes. Those with an external locus of control feel as though chance or powerful others are in control, and that they have less influence on their life path or the events that they are involved with.

A number of articles have demonstrated that internal locus of control contributes to more active information processing and information-seeking. For instance, Drozda-Senkowska (1982) found that internals perceived unexpected information more quickly than externals. Bernardelli, de Stefano, & Dumont (1983) found that internals sought career-related information more actively than externals. Prociuk & Breen (1977) found that internals demonstrated more information-seeking relevant to the completion of academic course requirements than externals. Weiner & Daughtry (1975) found that internals would seek more information than externals when the degree of task-control was explained using intentionally vague language.

The locus of control construct has also been specialized for different contexts, and example of which is healthcare. Thus the locus of control scale was adapted to the health field in order to measure specific health-related locus of control. An early study showed that using the health-related measure of locus of control in an information seeking task, internals who valued health highly relative to others chose more pamphlets about the particular health condition under study (hypertension) than did internal-low health value subjects or externals regardless of their health value (Wallston, Maides, & Wallston, 1976).

Usability researchers have hypothesized that allowing users flexibility to direct their own searches will increase system usability (i.e., measured in terms of the efficiency, effectiveness and satisfaction of the user interface). For instance, Shneiderman's 8th golden rule recommends that interface designers “support internal locus of control” (Shneiderman, 1998). Similarly, Nielsen’s third rule reads “User control and freedom” (Nielsen, 1990). In practice, these rules tend to be vague and designers interpret increased control and freedom in many different ways (through menus, preferences, options, etc.) (Thornton, 2002).

Self-efficacy (Bandura, 1994) appears to be somewhat similar to the construct of locus-of-control, a meta-analysis estimating a .5 correlation (Judge et al., 2002), or roughly 25% shared variance. Self-efficacy describes the personal confidence and motivation to act. For example, a person with high self-efficacy who wanted to diet would feel confident that he or she will make dietary changes, and that his or her efforts would be successful, versus a person low in self-efficacy who may feel like he or she won't adhere to dietary changes, and that whatever changes are made will likely be ineffective.

Research has found that self-efficacy as well as need for cognition influence how people navigate websites (MacGregor & Kim, 1999).

Desire for Control (DfC) describes a person's preference to be in-control of the self in terms decisions and actions, and of situations in general that influence the self (Burger, 1992). A review of 9 studies shows a consistent moderate correlation between DfC and Type A personality: $.22 > r > .68$ (Burger, 1992). Participants who are high in DfC tend to control the initiation and close of conversations, lead the topic of conversation and engage in more loud and rapid speech. If two high DfC individuals are paired in a conversation task, they are more likely to interrupt each other than if high and low DfC individuals are paired (Dembroski, MacDougall, Musante, 1984). In an anagram task, those high in DfC are likely to choose harder problems. In a proofreading task, the high DfC individuals perform better, especially when extra tasks are added in order to increase difficulty. Those high in DfC are found to persist longer in trying to solve unsolvable puzzles. Those high in DfC are more likely to attribute chance performance to being under their own control (Burger, 1992).

Information Processing and Attention

Individual differences in cognitive style and ability have their effect against the backdrop of information processing and attentional processes that are shared in the same general form across a broad range of people. In this section, the role of attention in information-processing is discussed. This is followed with a discussion on the nature of selective and divided attention and their models, focusing on their implications for understanding interruptions and dual-task situations of the types considered later in this thesis.

Current models of information processing derive from the model characterized by Neisser (1967) based on earlier information theoretic work concerning the capacity of short term memory (Miller, 1956) and perceptual processing (e.g., Fitts, 1954; Garner, 1962). Subsequently the model was elaborated by Lindsay and Norman (1975) in a form which is still recognizable in more recent descriptions of human information processing (e.g., Wickens and Hollands, 2000).

One of the most contentious issues in the elaboration of models of human information processing has been the process by which attentional resources are allocated to the processing of information. This process is somewhat analogous in a computing context to the problem of how computing cycles get allocated to multiple tasks.

Early discussions of attention as a construct (e.g., Cherry, 1953; Broadbent, 1958; Treisman, 1964), Deutsch and Deutsch, 1963) examined the problem of focused or selective attention where unattended information was filtered out. This research used dichotic listening tasks where participants were instructed to repeat back ("shadow") speech transmitted to one ear while ignoring a second speech channel sent to the other ear, suggested that there is an attentional bottleneck that occurs early in information processing. Broadbent found that stream characteristics (such as origin) influence how easily the listener distinguished between the streams in the dichotic listening task. Broadbent's Filter Theory (Broadbent, 1956) posited a complete switch from one incoming message to another, funneling information to an area in order to be perceived or to a very short term (acoustic code) memory buffer if there is more than one incoming channel.

Some lines of evidence suggest that the information stream in the unattended channel is more deeply processed than one would expect based on Broadbent's filter theory. Words in the unattended channel have been found to interfere with shadowing when words were semantically related, with two other studies showing that words in the unattended channel influenced the interpretation of ambiguous terms in the attended channel (Lewis, 1970, Lackner and Garrett, 1972, and MacKay, 1973, as cited by Hirst, 1986).

In contrast to Broadbent's bottleneck theory, Kahneman (1973) focus on attention as a global resource that could be assigned to different tasks up to a maximum level for each person determined by the state of arousal that the person was in. In Norman and Bobrow's (1975) resource theory the amount of resources are shaped both by processing effort and by the size of short term memory. Norman and Bobrow noted that as resources are concentrated on a task, the performance of that task improves.

While Broadbent's filter theory posited a central resource pool, as did Kahneman's (1973) model of attention and arousal, Wickens' Multiple Resource theory described attention as consisting of multiple pools of attentional resources (Wickens, 1984). Wickens characterized the resource pools as consisting of four dimensions: 1) stimulus characteristics (visual and auditory), 2) internal codes (visual, verbal), 3) response characteristics (manual and speech), and 4) levels of processing (shallow and deep). Recent research debating the issue of central versus multiple resources (Bonnel & Hafter 1998) looked at the neurocellular level when comparing resource use for visual and audio detection (is there a change?) and identification tasks (direction of change?). Bonnel and Hafter found that while detection appeared 'capacity-free', identification was 'capacity-limited' and showed a tradeoff between the audio and visual tasks. They conclude that processing limitations are central rather than located in the visual and audio cerebral peripheries. Another recent study argues for the opposite conclusion (Awh et al., 2004). In a target discrimination task, letters and digits appears to draw from separate attentional resources because of a lack of ‘attentional blink’, a period of several hundred milliseconds when the processing of subsequent targets is impaired.

Regardless of the exact nature of resource pools or skills, individuals can share two tasks in a number of ways (Hirst, 1986). In his review, Hirst explains the concepts of grouping tasks, segregating tasks and time-sharing tasks. Grouping tasks into higher-order structures would partially consolidate tasks in order to perform them together in a meaningful way. For example, if you had to tap twice with one hand and three times with the other, one could interleave the taps. Segregating tasks involves directing one task to a resource to insulate it from another. For example, while driving, one may use audio and visual clues to inform behaviour. If one is talking on a cell phone, one may disregard audio driving cues and concentrate only on the visual stream to inform driving behaviour. Lastly, time-sharing refers to when individual continually switch their attention from one task to the other.

Since executive processes are required to manage tradeoffs between attentional resources in complex dual task situations (Norman & Bobrow, 1975), a role is suggested for cognitive ability in mediating task performance. Working memory, in particular, is an ability that has been implicated in affecting performance in a wide variety of tasks.

The literature reviewed the structure of working memory and studies conducted to answer questions about its nature. The central role of working memory in managing dual tasks is described. Differences in working memory have wide-ranging implications, from low-level perceptual tasks such as focusing attention to high-level cognitive tasks involved in problem solving and intelligence. The following chapter focuses on the processing used to handle interruptions and how individual differences such working memory affect performance.

Interruptions

An interruption can be characterized as an additional task that draws from limited resources, and that places a demand on working memory, resulting in dislocation of 'older' (prior) material (Latorella, 1996). Trafton et al. (2003) describe the stages of an interruption: 1) the alert, followed by a short period where the individual reorients her attention; 2) the start of the new task; 3) the completion of the new task, followed by a re-orienting of attention to the previous task; and 4) the resuming of the previous task (primary) task.

While attentional psychologists have been discussing the nature of interruptions for decades, McFarlane (2002) has recently put together a taxonomy aimed at the Human Factors and Human Computer Interaction communities. He classified notifications into four groups: immediate, negotiated, mediated and scheduled. Immediate interruptions call for the user's attention instantly. The negotiated interruption allows choice in how to handle the interruption: right away or at a later time. The mediated interruption is based on a third-party decision about when it is appropriate to interrupt the individual.

Scheduled interruptions indicate that the user has agreed to be interrupted at a certain time in a certain way, in order to plan for the interruption. McFarlane compared responses to each of the interruption types in a game task where the user bounced an object three times, and then proceeded to bounce the subsequent object three times, etc. Negotiated interruptions allowed for the best user performance while immediate interruptions were responded to more quickly. A study with a similar research question examined the effect of different interruptions on 38 business majors during a code debugging task (Robertson et al., 2004). They found that negotiated-style interruptions were superior to immediate style interruptions in terms of coding performance and strategies.

Similar to the usability literature regarding information-seeking, the interruption literature has design guidelines that support giving users control. Obermayer and Nugent (2000) propose a list of UI guidelines for alert systems in Navy command that recommends infrequent interruptions, matching the degree of intensity of the alert to the severity of the message and providing users with control over when to handle interruptions.

The effects of different types of interruptions have been researched. In a web search task, 9 users were interrupted by incoming instant messages that were related or not related to their current task (Cutrell et al., 2000). The investigators found that interruptions with semantically relevant content had less of a performance impact than unrelated interruptions. An interruptions study was conducted with a VCR programming task (Monk, Boehm-Davis & Trafton, 2004). The authors looked at interruptions during different parts of the VCR task and found that the greatest performance impacts occurred when the interruption was placed in the middle of a task, as opposed to natural breakpoints in subtasks.

Individual differences and Interruptibility

Interruptions tend to be damaging to processing when people are in mid-task, but are there individual differences in how people handle interruptions? Most interruption research in Human Factors has not explicitly considered issues of individual differences, focusing instead on building models of user behaviour in order to predict good windows of opportunity for interruption (for example, Hudson et al, 2003, Sawhney & Schmandt, 1999, and Iqbal et al., 2005). However, there has been some research on the extent of between-subject differences in handling interruptions as secondary tasks (eg. Latorella, 1999; Kirmeyer, 1988; Jolly & Reardon, 1985).

Individual differences may moderate how interruptions are processed. For example, individuals can be classified along a Type A/Type B continuum where a Type A pattern is characterized by hostility-aggression, impatience or time urgency, and striving for competitive achievements, while Type B is in contrast more patient, easygoing and noncompetitive. Type A behaviour has been found to be predictive of the likelihood and severity of coronary heart disease (Jenkins et al., 1976). The type A/type B distinction has also been found to moderate how stressful the effects of interruptions are. In a field study following 72 police officers, participants were observed for between one and three shifts and the number of interrupted tasks were recorded (Kirmeyer, 1998). Activities were coded as sequential if one was finished before the next begun, pre-empted if a current activity was left unfinished while the new activity began, or simultaneous if both tasks were attended to at the same time. Participants reported their level of stress throughout the shift. Type A reported feeling more overloaded and took more coping actions than Type Bs. Thus, Type Bs were more easily interrupted than Type As because interruptions caused less stress for that group (Kirmeyer, 1998). Type A behaviour is related to control in that Type As demonstrate a higher need for control, measured with the desirability of control scale. (Anderson, 1988; Burger, 1992).

Cognitive style has also been found to be associated to interruption-related behaviours. A study examined 5072 prescriptions over a 23-day period, from 14 pharmacists who were scored for field dependence/independence (Flynn et al., 1999). Pharmacists with a lower score (field dependent) had higher prescription error rates than field independents. A total of 2022 interruptions occurred during prescription writing. There was significant correlation between number of interruptions and GEFT score, implying that dependents were subjected to more interruptions during the trial-period, or that independents are more resistant to interruptions, in other words, field independents change their focus less often than dependents. As mentioned in the previous section on cognitive style, an early study by Konstadt and Forman (1965) found that field dependents were more easily distracted during memory and learning tasks. Jolly and Reardon (1985) conducted a study that interrupted a semi-automated administrative coding task with mild, severe or no interruptions. They found that field dependents switched more of their attention to the interruption, resulting in poorer primary task performance. In a flightpath management (FPM) task, Latorella (1999) interrupted participants using auditory calls or visual presentations. He found that individual differences significantly affected interruption acknowledgement time, interruption initiation time, resumptive FPM activity, performance errors and overall performance time and FPM activity. Further, the modality of the interruption affected interruption acknowledgement time, interruption initiation time, and the number of errors made.

Individual difference in cognitive style and Type A/Type B, or control, have been related to interruption-related behaviours in the medical, psychological and air traffic control domains. The field dependent cognitive style is consistently related to a switch of attentional focus to the most salient environmental cues (in these cases, interruptions in auditory, visual and mixed modalities) with accompanying higher degradations in performance in the primary task.

Attention, Interruptions and Driving

This section will discuss the key concepts of ability and information processing relevant to understanding behaviour while driving.

Horrey and Wickens (2004) reviewed the research literature on driving and cell phone use for General Motors Corporation. Their meta-analysis indicates that processing tasks such as doing mental arithmetic have less performance impact on driving than conversation tasks. They also found no significance difference in performance decrements due to hands-free vs. hand-held mobile phones. Wickens suggested that the best performance indicators are continual indicators like lane centrality rather than reaction time to discrete events such as emergency maneuvering. Studies using driving simulators show consistent effects, whereas field tests were found to have more variable effect sizes. Regarding conversation tasks, a study compared speech production and comprehension on simulated driving performance (Kubose et al., 2004). In the dual-task situation, they found that producing and comprehending speech produced more variable velocities, larger and more variable headway times and more steady control over lane position. It is worthwhile to note that in the research literature on driving performance there is an ambiguity in terms of how the dependent measure of lateral position should be interpreted. In some cases high variability in lateral position has been interpreted negatively as indicative of loss of control whereas in other cases it has been interpreted positively as indicative of degree of responsiveness to changes in the context in which driving takes place.

Sheridan (2004) created a model from a control theory perspective to describe the switch of attention away from the driving to the non-driving task. His theory describes conscious, selective attentional switches of attention and focuses on 'sensing and control'. The theory is aimed at naturalistic driving settings, for example, where drivers feel in-control of the vehicle and choose to shift their attention to tuning the radio.

A recent study delved into the effects of the interruption component of distractions during driving. A study comparing driver-controlled (negotiated interruption) and system controlled (immediate interruption) email systems while driving (Jamson et al., 2004). While the system controlled interface produced faster secondary task results (email processing), the negotiated interface led to fewer secondary task (email processing) errors and there was a borderline significant trend ($p<.10$) for better primary task (driving) performance in the negotiated interruption interface.

Individual differences are likely to produce changes in both driving and secondary task performance. For example, Locus of Control has been related to driving patterns. Brackstone (2003) carried out a study using on-road (as distinct from simulated) vehicles. Brackstone found that externals left more distance between their vehicle and the lead vehicle than internals. This behaviour is likely due to anticipation that oneself needs to have leeway to react to other driver behaviours, whereas internals think that their own driving is more important than anticipating or reacting to others' behaviour.

Summary of Literature Findings

As the foregoing review of the scientific literature shows, there is a complex relationship between cognitive ability, cognitive style, information processing, dual task performance, and interruptibility.

Cognitive processing is governed by bottom-up and top-down processing. Control and cognitive style influence how individuals attend to the environment: field independents and those with internal locus of control are more reliant on top-down processing.

The research on selective and divided attention, and dual task contexts in particular showed that humans have limited attentional capacity and that attention focused on one information stream yields the best performance, and with more information streams limiting resources to each stream. Characteristics of the information stream (such as auditory versus visual), of the person (e.g., effort exerted, size of working memory), and of the task (detection versus identification), affect the amount of resources required and resulting performance.

Interruptions are understood as switches of attention from a primary to a secondary task, and are classified along a continuum of synchronicity: from immediate to negotiated. Negotiated interruptions give users more control over how to divide their attentional resources, and result in better dual-task performance.

The literature review then concluded with a discussion of how individual differences moderate the impact of interruptions. For instance, the literature concerning the relationship between cognitive style and interruptibility suggests that field dependents are more susceptible to interruptions than are field independents.

Control has not been scientifically related to interruption-related performance, but a relationship can be postulated from the literature concerning Type A/Type B differences. Immediate style interruptions give the user less control over handling the interruption while negotiated interruptions give the user control to decide when to handle the interruption. This implies that those with a high-desire for control will prefer negotiated interruptions over immediate style interruptions. This may also lead to better driving performance since there is research evidence that driving performance tends to improve, and secondary task performance tends to be more accurate (but slower) when negotiated interruptions are used.

Individual differences in memory capacity are also likely to influence the impact of interruptions. Thus the relationship between the size of an individual's operating span and their driving performance (interruption impact) during interruptions is of interest to this research.

The problem of handling interruptions while driving was reviewed. Research into cell-phone use finds that the attention shared with the speech comprehension and production are equally costly, and that phone form-factor such as hands-free makes only a minor difference. Driving performance variables indicative of responsiveness and precision in driving are measured as primary task performance. The next section describes how driving characteristics are assessed when users engage in the additional, secondary task of handling interruptions.

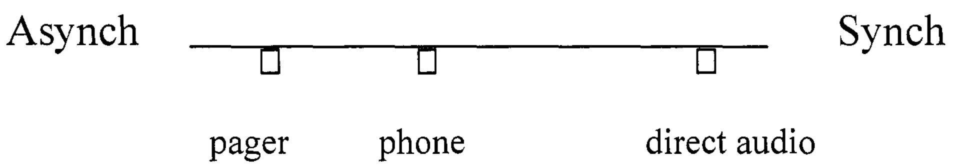
3. Research Framework and Methodology

This research aimed to investigate how different notification types impact driving performance. This chapter describes the research framework and methodology that was created to carry out this investigation.

The first aspect of the research framework for this thesis is the nature of interruptions. In the following discussion, a two-dimensional framework for interruptions will be introduced. One dimension will be the "Immediacy" of the interruption, and the other dimension will be "Initiation Style" (Push vs. Pull) of the interruption.

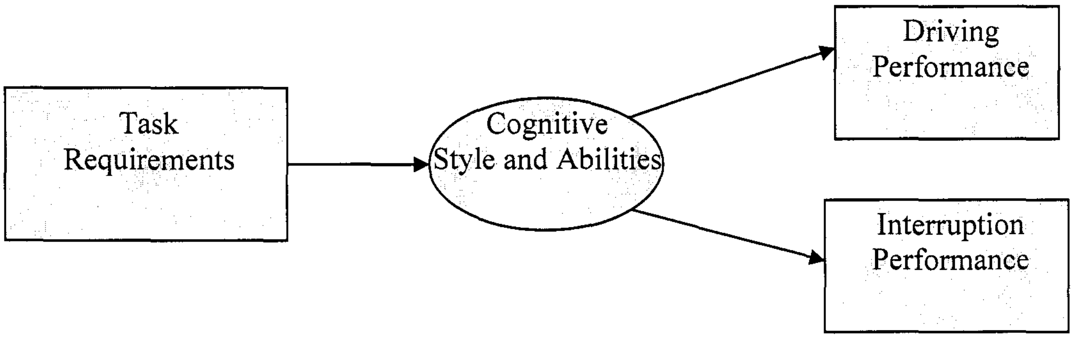
Using a simple classification of interruptions (cf. McFarlane 2002), interruptions can be placed along a continuum of synchronicity from immediate, to moderately negotiated to fully negotiated (See Figure 1). For example, pagers are negotiated-style or asynchronous, while face-to-face interruptions are immediate style, or synchronous. A phone with the settings set to stop ringing after a certain number of rings would give the user some leeway in their response; thus qualifying as a moderately negotiated interruption. A negotiated-style interruption allows flexibility in choosing when to devote attention. The immediate style interruption is presented instantly. For example, a driver could answer the pager after passing a busy intersection, whereas if a car passenger made a statement, it would be more difficult to delay changing the focus of attention. Notifications are used to 'push' information to operators. Notifications can fall in different places along the push – pull continuum, and their placement depends on operator behaviour. If a person answers a phone call immediately, the notification can be seen as a 'push' agent. If a person waits twelve rings until she decides that she is ready to take the phone call, the notification has more of a 'pull' characteristic

Figure 1. Interruption classification along the synchronicity continuum



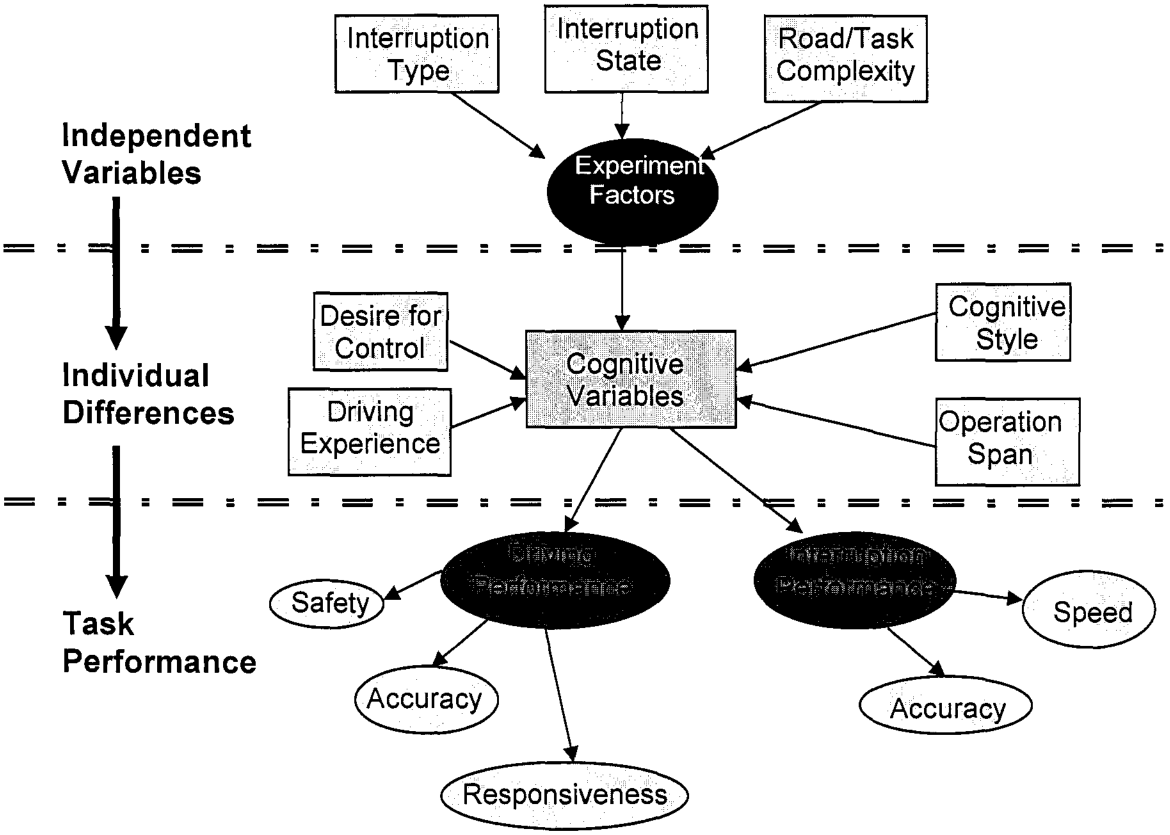
Individual differences were expected to mediate the impact of interruptions (See figure 2). In the experiment described below, desire for control, communication preferences, cognitive style, and working memory were assessed. Driving performance within the experiment was used to evaluate reactions to simulated pager, phone and face-to-face interruptions (See figure 3).

Figure 2. Overall Model of Effects of Cognitive Style and Abilities on Task Performance



Cognitive ability mediates the impacts of task requirements on task performance. Differences in cognitive ability are likely to be particularly important in dual task performance. Figure 3 applies this general model to the experiment that was carried out.

Figure 3. Model of Effects of Cognitive Variables on Interruption Task and Driving Performance



3.1. *Hypotheses*

The following hypotheses are derived from the literature reviewed in the previous section. Assertions are made on how individual differences will affect preferences and performance (as assessed using a range of simulator-derived dependent measures[1]) in the present study. Assertions are followed by support from the literature.

H1. Differences in notification types

H1.1

Participants will experience less impact on driving performance from negotiated style notifications than from immediate style-notifications.

H1.2

Participants will answer mathematical questions more quickly following a negotiated style interruption versus an immediate style interruption.

Hypothesis 1 is supported by earlier findings from McFarlane (2002), who found that users experience less performance impact with negotiated interruptions. Negotiated-style notifications in that study gave users more time to switch attention, when compared to immediate style notification. In the present study, it is expected that when users are engaged in a demanding situation within the driving task, they can take advantage of the extra seconds allowed in a negotiated style interaction to answer the call. Following this expectation, users should be more prepared and ready to think about a mathematical question when they have the warning time provided in a negotiated interruption.

H2.1. Individual differences and preferences

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[1] More detail on the assessment of driving performance is provided in the next section.

Participants with a high need-for-control will prefer negotiated-style notifications more than participants with a lower need-for-control.

Since Desire-for-Control is a preference based measure, it is likely that individual with a strong preference for control in conversations and everyday situations (Dembroski, MacDougall, Musante, 1984; Burger, 1992) will also prefer more control over the notifications present in this study. The immediate style interruptions give the user less control over handling the interruption while negotiated interruptions give the user control to decide when to handle the interruption. Thus, those with a high-desire for control will prefer negotiated interruptions (and may also perform relatively better when using negotiated vs. immediate interruptions, see H2.2.5).

H2.2 Individual differences and performance

Table 1 summarizes the expected relationships between the individual difference variables and performance when answering the math questions and when faced with the two types of interruption (See text below the table for a discussion of each of these hypotheses.)

Table 1. Hypotheses relating Individual Differences to Performance

	Negotiated interruptions	**Immediate interruptions**	**Mathematical questions**
Field Dependent	Faster response to ringing (H2.2.1) greater perf. decrement (H2.2.3)		
Field Independent	Slower response		

	to ringing (H2.2.1) less perf. impact (H2.2.3)		

	Negotiated interruptions	**Immediate interruptions**	**Mathematical questions**
Large Working Memory		less perf. impact (H2.2.4)	faster, more accurate (H2.2.2)
Limited Working Memory		greater perf. decrement (H2.2.4)	slower, more math errors (H2.2.2)

	Negotiated interruptions	**Immediate interruptions**	**Mathematical questions**
High Desire for Control	less perf. impact (H2.2.5)		
Low Desire for Control	greater perf. decrement (H2.2.5)		

H2.2.1

Field dependents will respond faster to negotiated-style notifications than field independents.

Field dependents are defined as being dependent on environmental cues rather than on internal direction from their own cognition. Casson (1983) related cognitive processing with reactions to environmental cues: engaging in more top-down processing results in directing one's own attention and actions while engaging in more bottom-up processing leads to cues in the environment directing attention. Hence, field dependents, described as depending on environment cues to direct actions, are likely to engage in more bottom-up processing, should be more receptive to environmental notifications and are expected to respond faster to such notifications.

H2.2.2

Driving performance of field independents will be less affected by negotiated-style notifications than field dependents.

Following from the previous hypothesis, field dependents are expected to respond readily to interruptions. If that is the case, then they would take less time to plan an optimal break in the primary task. Thus, it is hypothesized that independents will make better decisions about the best time to answer a call in order to minimize driving performance decrements.

H2.2.3

Those with a large working memory will respond faster and more accurately to mathematical questions than field dependents.

Large working memory is associated with higher scores on mathematics tests (Spearman, 1904). This implies that those with high working memory will answer mathematical questions (that follow notifications) more quickly and more accurately than those with a lower memory capacity.

H2.2.4

Those with a large working memory will respond with less performance impacts to immediate-style notifications than those with a small working memory.

A large working memory is associated with more mental resources (Broadbent, 1958). This implies that those with high working memory be able to handle divided attention tasks better than those with a smaller capacity.

H2.2.5

Those with a high-desire for control will respond with less performance impacts to negotiated-style notifications than those with a low desire for control.

Those who strongly prefer to have more control may prefer it because it allows them improved performance. In other words, their preference may stem from personal knowledge that performance suffers when not given control. This hypothesis is tested in this study by correlating notification preferences and actual driving performance.

3.2. *Methodological approach*

In this research, individual differences in cognitive style, working memory, communication preferences and desire for control are measured in order to identify which characteristics predict performance and preferences regarding notifications. A dual primary-secondary task paradigm is used in order to assess the cost of engaging in a notification task (secondary task). Driving was selected as a continuous primary task with varying degrees of difficulty depending on road conditions. Performance decrements in this primary task when interrupted with a secondary task are assumed to be caused by attention being shifted to the secondary task. In order to motivate operators to respond to interruptions, they are followed by mathematical questions that, when answered correctly, provide financial remuneration. A mixed (between/within) experimental design is used to compare participants based on (between subject) individual differences and (within subject) different types of notifications.

A study was conducted assessing 1) operators' individual differences, 2) driving performance during notifications and 3) preferences regarding notifications. Participants were clustered based on their individual differences. Statistical relationships between driving performance and individual differences were analyzed in order to relate individual differences to performance and preferences regarding different types of notifications.

Driving Performance Measurement

The literature on driving uses a number of standard measures to describe driving performance (eg. Jamson et al.). Lane control is measured by standard deviation in lateral lane position. Generally, more variability is interpreted as less control, however sometimes very little variability is interpreted as unresponsiveness. Lane control is also measured by variability in steering wheel angle and the number of lane departures. Speed control is considered a proxy for driving control. Speed control is often measured by standard deviation in longitudinal velocity, where less variability is interpreted as a steady, controlled velocity. A corresponding interpretation exists for gas pedal usage. The headway between the operator's vehicle and the leading vehicle is indicative of the operator's expected response time needs. In other words, leaving a shorter headway is interpreted as high confidence in one's ability to respond, while longer headways are interpreted as compensation due to less ability to respond. The time-to-collision measure refers to the 'safety margin' between the operator's vehicle and any other vehicle on the scene. It is measured by the distance between the two vehicle divided by the relative velocity of the two vehicles.

3.3. *Study Description*

The driving and individual differences study was conducted at the Interactive Media Laboratory within the Mechanical and Industrial Engineering Department of the University of Toronto, during the summer of 2005.

The sessions began with the administration of a consent form (See Appendix H), the Entry Questionnaire (See Appendix A), the short CPI (See Appendix B1), additional communication related questions (See Appendix B2), and the Desire for Control questionnaire (See Appendix C). The short workbook assessing cognitive style was administered next (GEFT; See Appendix D). Lastly, the test to measure operation span was performed on a PC in the same room as the driving simulator.

Following assessment of individual differences, participants were introduced to the driving simulator (See Appendix E). It was an STISIM simulator model built in 1986.

The setup included three monitors for the driving scene, the accelerator and brake pad, the steering wheel and the response set-up for notification receipt, which was a mouse affixed to the centre of the steering wheel.

Participants were then told that notifications would commence during driving. Notifications were described as having three types: a direct audio communication (outputted from nearby PC speakers), a phone-like ringing that could be answered using the mouse, and pager-like beeping that could be answered using the mouse (output from the same setup). The notifications were followed by a mathematical question. The notifications (direct speaking for face-to-face, ringing for phone call, beeping for a page) were demonstrated using the demonstration program (See Appendix I), during the last two minutes of the first five minutes of driving practice. It was made clear to participants that responding to a phone-ring or a page-beep would involve pressing the mouse button (left and right buttons were equivalent), when the participant was ready to respond.

Participants were told that they would start with a practice session to get used to driving and being notified. As mentioned above, the first three minutes consisted of driving only, and the last two minutes consisted of driving plus interruptions.

Driving practice consisted of driving along a road with different types of car events. The same driving events occurred in the practice session as in the actual testing session. Three minutes in to the practice session, participants were interrupted by three instances of each type of notification (along with mathematical questions) with these interruptions being separated by a period of 20 seconds. Mathematical questions were in the format "A (e.g., 13) plus B (e.g., 27)" or "C (e.g., 73) minus D (e.g., 27)". Rules for the mathematical questions were derived in order to regulate the difficulty of the questions. The numerical terms used in each question were each double digits (i.e. between 11 and 99), and the sign was randomly chosen: a '+' or '-'. For the addition problems the sums used did not add to more than 100. For the subtraction problems, all the correct answers were positive numbers (zero or above). To ensure adequate difficulty, the two number terms used in each question were not be the same, and they were not multiples of 10 apart.

The audio for the math terms was synthetically created from an online website (AT & T). The synthetic files ensured that there would be similar amounts of audio "white space" surrounding each term. [2]

Following the five minutes of practice driving, the participants had a 5 minute break while the driving simulator system was re-started. Participants took this time to review an instruction sheet with the formula for payment (See Appendix F). The payment plan was constructed in order to manipulate the goals and priorities of the participants. Crashes had the maximum penalty, while speeding or driving too slowly had minor penalties. The way in which participants could increase their remuneration was through answering the mathematical questions correctly. Participants were asked verbally to drive in the middle

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[2] If, for instance, the recordings were done live and there was 0.55 seconds of white space before the term 32 and only 0.30 seconds before the term 31, then extra processing could be done before hearing the term 32, which would decrease the time needed to respond to the full math question. In order to eliminate this problem, synthetic audio was used.

of their lane, and to generally drive as safely as they would with an actual vehicle on the road.

The participant then commenced the 35 minute driving test. The first 22425 feet of driving distance was allotted for practice and there were no interruptions during this time. This practice distance took approximately 5 minutes to drive at the targeted speed of 55 miles per hour. Thus there was a total of approximately 10 minutes of practice for each participant (five minutes to become familiar with driving, and 5 minutes to practice driving with interruptions).

Once the participant traveled the initial practice distance, an audio file notifying the user to "maintain a speed of 55 miles per hour" was played. This allowed the investigator to begin the notification program. The sequence allowed the Time 0 of the notification program to be mapped to the time that 22425 foot distance was crossed. One notification happened every minute (with equal probability of being initiated at any second during the first thirty seconds of the minute). The 30-second window ensured that the participant had the full amount of response time to answer a pager-beep, which was the longest interruption type. Since there was one notification per minute, there were a total of 30 interruptions (10 of each type: see Table 2) per session that were administered in a random order. The software program written in Java initiated the interruptions, read in the input that the user had received the message (from the mouse button-press), and constructed and spoke a random mathematical question (in the formats described above).

Table 2. Interruption types and response time windows

Interruption Type	Notification sound (in blocks)	Length of notification (time in seconds, also corresponding number of blocks)
Face-to-Face	n/a	0
Phone	rings	10
Pager	beeps	20

The ring and tone were normalized for their length (total of 1.00 seconds, including a brief pause), for their volume and for their pitch. The program Audacity (GNU, GPL) was used to equalize the volumes and pitch of the sounds.

The driving scenario consisted of events such as easy and difficult curves in the road, oncoming vehicles and leading cars that need to be passed. Driving scenarios were constructed so that an adequate level of difficulty would be maintained, as well as enough variation to circumvent boredom. Hard curves and soft curves were placed along the road at semi-random intervals. Oncoming vehicles were placed sparsely. Lead vehicles were place at semi-random intervals so that there would often be at least one leading car in the horizon. Four scenarios (different random sequence for the events) were used in order to counter-balance any order effects of a particular sequence of events.

The session was closed with the administration of the Exit Questionnaire (See Appendix G). The participant was paid and signed the payment receipt.

Participants

The participants were individuals who had driving experience and were within the target age range of 18-35 years. These two main criteria were selected to reduce various sources of variation including the amount of attentional resources that needed to be devoted to the primary and secondary tasks.

Driving experience was deemed necessary to ensure that the study participants had knowledge of general vehicle operation and rules of the road. This ensured that the participants did not need to learn the rules prior to the study session, and did not need to spend cognitive resources recalling these rules during the study. Additionally, if the participant was habituated to using the steering wheel and brake, few additional cognitive resources were allocated to make decisions regarding moving hands and pressing the foot. If users devoted attentional resources to these actions, it would be difficult to isolate those attentional resources that were being devoted to the mechanics of the driving task from the resources devoted to the actual vehicle placement and movement on the road.

The age criterion was chosen because age has been shown to influence the size and speed of working memory (McDowd & Shaw, 2000). This study attempted to cover a younger population in order to isolate the effects of the individual differences studied.

Participants were also required to have normal or corrected-to-normal vision. The only exclusion criterion was the following: anyone currently taking medication(s) or substance(s) which may affect one's ability to safely operate a vehicle (e.g., sedatives, alcohol).

The proposed sample size for this study was 20 participants. The information in Table 3 was extracted to determine the sample size required for certain effects. The table is based on the number of participants required to have experimental power of .80. Statistical power of .80 indicates a strong likelihood of identifying an effect if it exists. Large effects are found with a sample of 20 and a high versus low group on each individual different measure (in other words, one degree of freedom), Based on the assumptions of a medium effect size (percent variability = .2) and a high versus low group on each individual different measure (in other words, one degree of freedom), 36 participants ensure power of .80 (Murphy & Myors, 1998). The sample of 20 participants used in the experiment reported below was chosen with the assumption of medium-sized effects. A similar methodology was adopted between the current study and Melanie Baran's (2005) study to allow for analyses of data pooled between Baran's study and this study.

Table 3.

Number of participants needed to detect small, medium and large effect sizes, p=.05 *

Effect Size		Degrees of freedom (v1)			
PV	d	1	2	4	10
0.01	0.02	777	954	1167	1582
0.09	0.63	83	102	126	154
0.2	1	36	44	54	75
0.34	1.44	20	24	30	41

* For an analysis of variability with F(v1,v2); PV = percent variability; d = proportion of standard deviation difference between means; and N = v2 +2.

Measures

The Entry questionnaire was used to assess demographic differences between users. For example, mother tongue may influence processing speed for comprehension of the math question, and mental translation into English if the math problem is mentally performed in the mother tongue. Further, frequency of cell phone use may habituate the participant to multitasking in the visual audio domain. The relationships between demographics, experience variables and performance and preferences were statistically explored.

The short version of the Communication Profile Index (CPI; Lottridge et al, 2005) was selected for use for various reasons. Since this study concentrated on the individual differences supported in the literature, only a short amount of time could be devoted to this measure. Communication preferences may correlate with preferences in terms of notification style; for example, those who prefer instant messaging may be more comfortable with immediate style notifications. The Short CPI has three factor subscales represented by its 16 items: Verbal Communication (VC), computer mediated communication (CMC) and work-related availability (WRA).

The 'Additional CPI' questions were posed in order to tease out differences in receiving and sending information. Different methods of sending and receiving afforded more or less control to the user and can be placed along different points of the synchronous-asynchronous, or immediate-negotiated, spectrum.

The group embedded figures test (GEFT) measured the cognitive style of the individual (See Appendix D). The test is comprised of 3 sections of timed visual puzzles. Participants located a simple shape within a complex shape, and traced the lines that delineate the simple shape within the complex shape. Those who were quickly able to locate and accurate trace the shapes were scored higher, as field independent individuals.

The operation span test was used to assess working memory (Conway & Engle, 1996; Francis et al., 2004). The test consists of judging a mathematical expression as true or false, and viewing a single word. A series of between two and six of these true/false plus word tasks are completed before the participant is asked to recognize the words and select them in the order that they were presented. A score for accuracy of the mathematical responses is given. The main outcome is a operation span score between 0 and 60.

The Exit questionnaire first asked users to list the strategies that they used in order to manage incoming notifications while driving. Second, it assessed preferences on a likert scale of what type of notification was preferred. Third, it ranked notifications against each other to see relative weighted preferences.

Data Preparation

This section outlines the measures collected in the study, and discusses how the data was prepared for analysis. The measures collected are shown in Table 4.

Table 4. Measure collected in current study

Variable type	**Variable**	**Source**
Dependent performance measures:	Total number of crashes	Driving simulator
	Vehicle speed, Pressure on accelerator, Pressure on brake, vehicle skew from centre of lane (and other performance indicators, such as lateral movement) at notification time and question response times, and in between. (See Appendix J for complete list of driving simulator variables.)	Driving simulator

	Driving events present during notification period (hard/easy/no road curves, oncoming vehicle, distance between participants' vehicle and other vehicles – See Appendix J for complete list of variables.)	Driving simulator
	Time to respond to notifications	Interruption program
	Time to respond to mathematical question (following the vocalization of the question)	Investigator (stopwatch)
	Accuracy of math responses	Scored by Investigator
Independent individual differences:	CPI factor scores	Scored by Investigator
	Working memory score	
	Message receipt preferences	
	DfC scores	
	GEFT scores	
	Demographic/background questionnaires	

The main task for data preparation was the merging of the interruption program data with the driving output data. The interruption data had the following fields:

- type (direct, phone, pager)
- start time (time since the program was initiated)

- response time (time it took participant to answer the ringing; 0 if direct)
- math question (in the format "73 + 12")
- time to output math question (for e.g., it take 2.345 seconds to vocalize "73 + 12")
- time to respond to the math question
- Accuracy (error size), also converted into binary correct/incorrect

Since there were 30 interruptions per person, there were 30 rows with each of the above columns.

In order to incorporate the interruption information into the driving simulator output, the times for each part of the notification was mapped to the driving performance at that instance. The data needed to be entered so that the following comparisons could be made:

- driving performance off-call and on-call
- driving performance during ringing, while listening to the math question, while considering the answer to the math question, and recovering from the call
- performance associated with accurate answers and incorrect answers.
- A 2.00 second recovery time was decided after discussion with research colleagues

The unique start and end times associated with each interruption were used to map the interruptions to the driving performance data. The point 0 reference time was indicated by the distance 22425 feet, at which point a verbal warning was output from the driving simulator. The investigator started the interruption program at that point in time. 1.00

second was added to the time when the participant passed 22425 feet to allow the investigator time to respond to the verbal warning. A description of the coding of the interruption data to be matched to the driving data can be found in Appendix K.

In order to compare driving performance off-call and on-call, and more specifically driving performance during ringing, while listening to the math question, while considering the answer to the math question, and recovering from the call, response times and performance data for those states needed to be aggregated. The averages were then used for analysis of variability (ANOVA).

Data Analysis

The sample will be separated into high and low groups for cognitive style (field independent vs. dependent), working memory (large capacity vs. small), and desire for control (high desire vs.low). The median or mean was used to divide the samples into approximately equal groups. Pearson's correlations and cross-tabs were used to detect relationships between variables. Participants were clustered via the K-Means Clustering technique in order to identify groups with similar response patterns.

ANOVAs were conducted between the independent and dependent measures to assess relationships between variables. The following analyses were explored in response to the main hypotheses, with a reminder of the direction of the hypotheses:

- GEFT by response time to pager/phone (H2.2.1: field independents are slower because they engage in more strategies, while dependents just react.)

- Operation Span score by response to mathematical questions (H2.2.3: those with larger working memories are faster.)
- Operation Span score by accuracy in answering the mathematical questions (H2.2.3: those with larger working memories are more accurate.)
- DfC with preference to notification type (H2.1: those with higher DfC want to control when they are ready to answer and thus will prefer pager/phone or direct.)
- Laslty, GEFT, Operation Span and DfC and driving performance (H2.2.2: field dependents have poorer performance; H2.2.4: Those with smaller memory capacities have poorer performance; H2.2.5: Those with low desire for control have poorer performance.)

Individual differences were also mapped to response times and performance and preferences

A regression analysis was performed relating the interruption number to performance, in order to assess whether performance improved over the course of the study.

4. RESULTS

The results section first describes the characteristics of the sample, then reviews the correlations and cross-tabulated relationships between variables, and lastly examines (using analysis of variance) the effects of the independent measures (notification types and states, and cognitive or individual difference variables) and on the dependent measures (various measures of performance and preferences).

Sample Characteristics

There were 20 participants in the study. An additional participant was removed from consideration in the data analysis because of incomplete driving data. Participants ranged between 19 and 33 years of age with a mean age of 23.5 years. 15 of the 20 participants were male. 11 of the participants had English as their first language. The remaining participants were fluent in English and had no difficulty in understanding the experimental instructions. On average, participants had between 4 and 6 years driving experience, and at the time of the study drove less then one hour per day. The mean length of time (within this sample) that participants had owned a cell phone was 3.29 years, with the participants reporting that they spoke on their cell phones an average of 19 minutes per person per day. Participants tended to disagree with a statement that they were comfortable using a cell phone in the car (m=3.50, i.e., tending to slight disagreement on a 5 point likert scale where 1= Strongly Agree, 3= neither agree nor disagree, and 5 = Strongly Disagree).

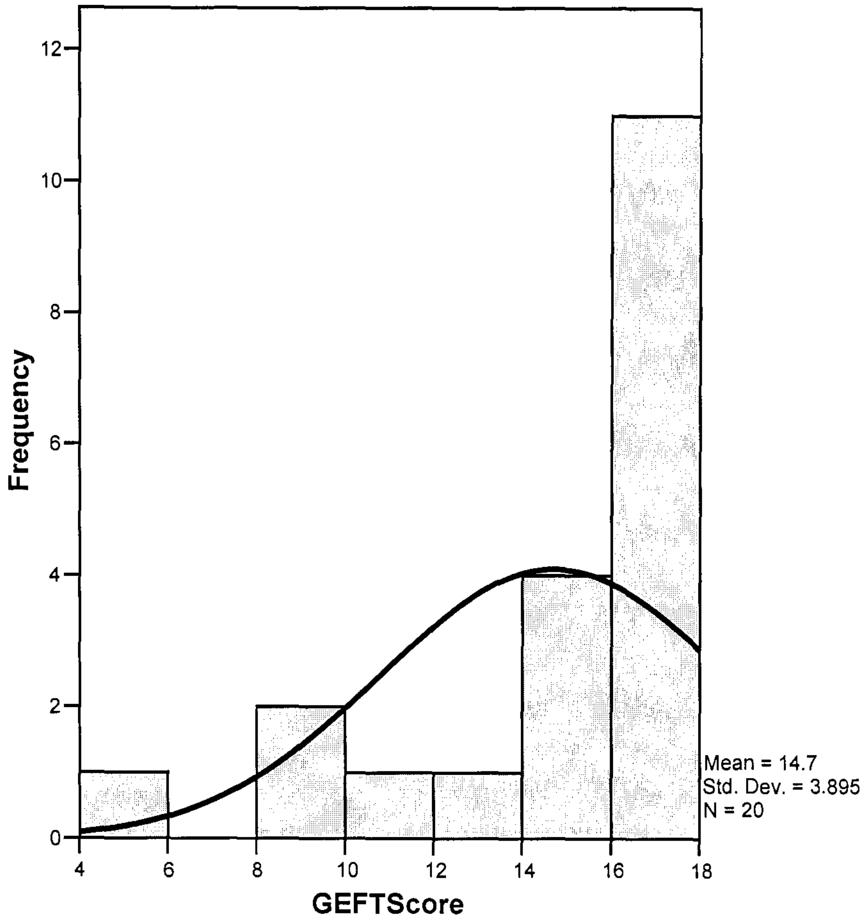
Communication Preferences

In terms of the short CPI scales that were calculated, the group mean (i.e., level of agreement) for computer mediated communication was moderately high (m=1.89, std.dev = 0.497) and verbal communication was slightly lower (m=2.34, std.dev = 0.602). Work related availability had a neutral mean and had a relatively high standard deviation (m=3.06, std.dev=0.879).

Cognitive Style

There was a negatively skewed distribution for cognitive style scores as shown in Figure 4. Participants were split into two groups above and below the median value (15).

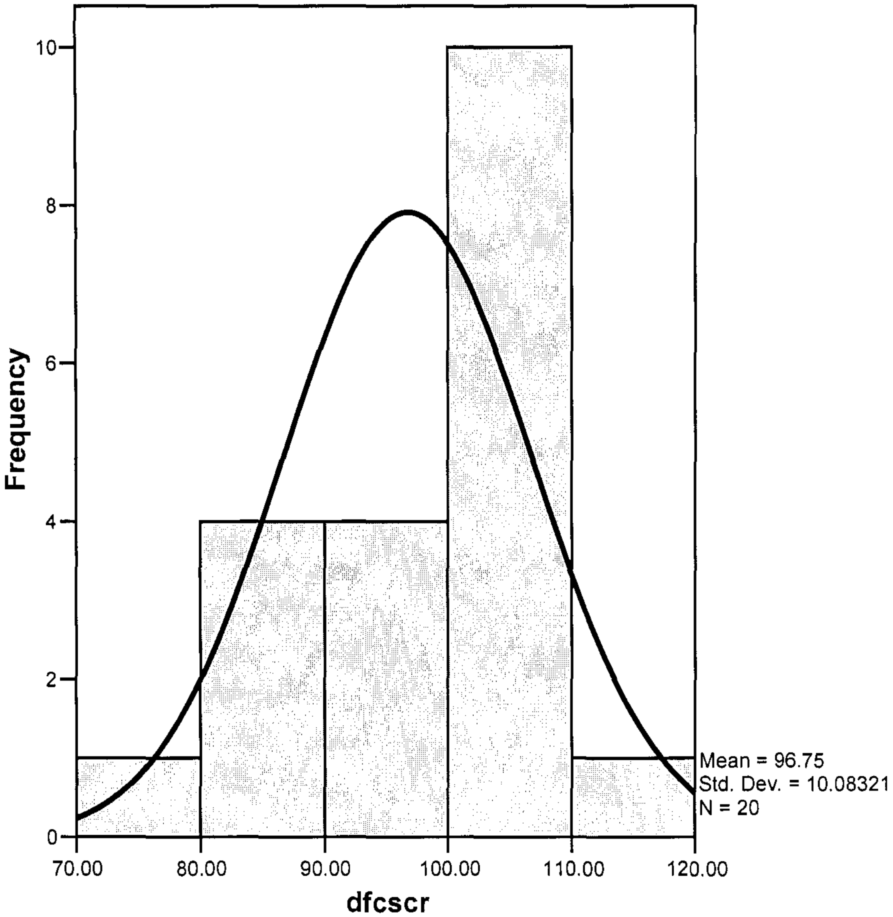
Figure 4. Sample GEFT scores



Desire for Control

For desire for control scores, the mean was 97, which was similar to the estimated population average of 100 (Burger, 1992). Participants were divided into groups above and below 100.

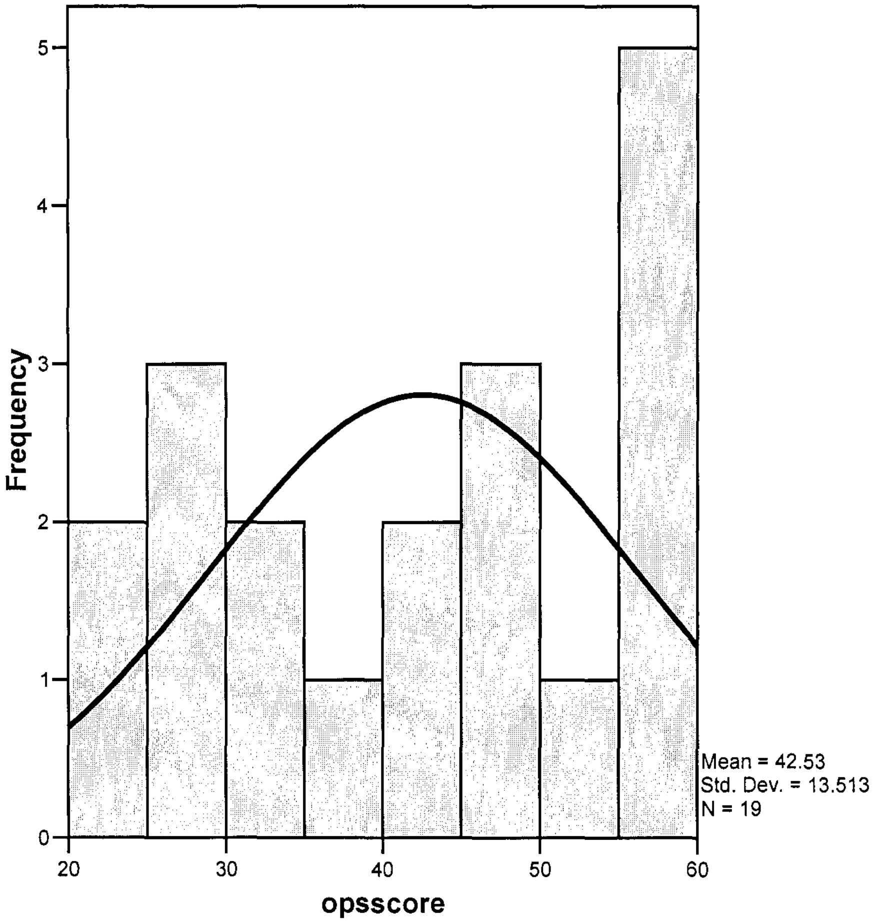
Figure 5. Sample Desire for Control scores



Working Memory

Working memory data for one participant was discarded because he misunderstood the instructions of the test and got a score of 0. Participants were divided into groups above and below the median of the sample (42.5).

Figure 6. Sample Operation Span scores



Individual differences Cross tabs

Crosstabs were performed in order to assess the within-sample covariation of the individual difference measures. The sample sizes for the four combinations of operating span and GEFT ranged from 3 to 6 as shown in Table 5. A Pearson correlation analysis showed no significant relationship between operation span and GEFT (r=.072, p=.385).

Table 5. Number of participants in each of the four combinations of high and low cognitive style and operation span in the sample.

GEFT \ OpSpan	low	high
low	3	6
high	6	5

The sample sizes for the four combinations of operating span and Desire for Control ranged from 3 to 8 as shown in Table 6. A Pearson correlation analysis indicated a borderline significant relationship between operation span and desire for control (r=.362, p=.064). (See Appendix L.)

Table 6. Number of participants in each of the four combinations of high and low Desire for control and operation span in the sample.

DfC \ OpSpan	low	high
low	6	3
high	8	3

The sample sizes for the four combinations of cognitive style and Desire for Control ranged from 2 to 7 as shown in Table 7. There was a borderline significant correlation between the two measures (r=-.329, p=.084; see Appendix L for details on this and other individual differences).

Table 7. Combinations for cognitive style and desire for control in sample

GEFT \ DfC	low	high
low	2	7
high	7	4

The distribution of the participants across high and low groupings of all three of the individual difference variables is shown in Table 8.

Table 8. Crosstabs of all individual difference groups in sample

Desire for Control	**GEFT**	**Operation Span**	
		Small	Large
Low	Field Dep.	1	1
	Field Ind.	5	2
High	Field Dep.	2	5
	Field Ind.	0	4

Communication preferences and Individual Differences

Desire for Control related to work related availability: the more an individual desired control, the more they were available and wanted others to be available for work related activities (r=.440, p=.03). Operation Span had a strong positive relationship with work related ability (WRA; r=.665, p=.001). There was also a borderline significant correlation between GEFT and computer mediated communication (CMC; r=.331, p=.083), where those who were field independent preferred to communicate with the computer. CMC and WRA were also positively related in this sample (r=.445, p=.028).

H1 Interruptions and Driving Performance

H1.1 Driving performance and immediate versus negotiated interruptions

On vs. Off-Call

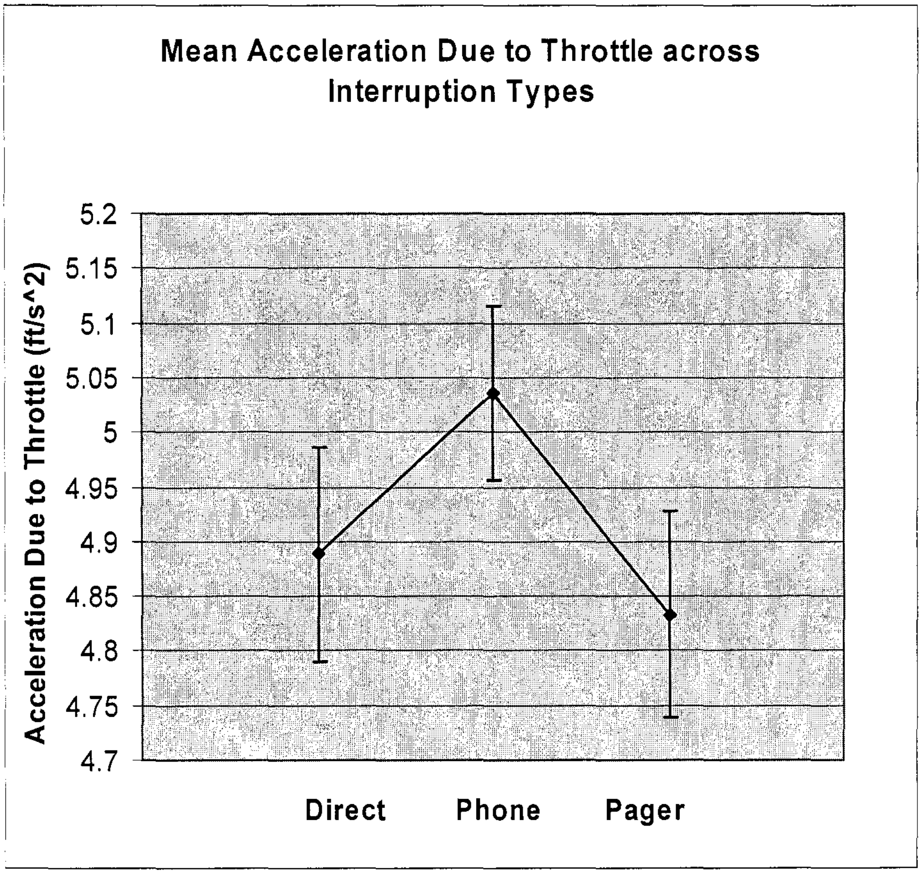
Repeated measures ANOVAs were carried out to compare the effects of being on vs. off-call on driving performance. Off-call performance can be considered baseline performance, and can be used as comparison to see which interruptions have the largest effects.

The root mean square (RMS) of participants' longitudinal velocity was higher off-call (70.528 ft/s, 69.107 ft/s, F[1,13]=4.707, p=.049), RMS lateral position was closer to the centre of the lane (4.339 ft, 4.498 ft, F[1,13]=8.512, p=.012), and the minimum time to collision was smaller (10.678 s, 11.953 s, F[1,13]=5.925, p=.030). Drivers appeared to drive less conservatively and more accurately when off-call.

Interruption Type

Interruption Type was investigated in order to compare the deleterious effects of immediate and negotiated interruptions. Comparing the interruptions (using their shared stages[3]), a significant difference was found in the RMS acceleration due to the throttle (F[2,26]=3.8444, p=.034; See Figure 7), where the throttle was used significantly less during pager interruptions.[4]

Figure 7.



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[3] Performance during the ringing portion of the negotiated interruptions was not looked at throughout the analyses of all three types of interruptions in order to allow for a symmetrical analysis with the direct interruptions.

[4] The error bars in this and the following figures represent the ± of two standard errors of the mean.

Participants exerted the most pressure on the throttle during direct interruptions. The off-call mean for acceleration due to throttle was 5.1238 ft/s^2, nearly identical to the RMS for the immediate interruptions.

The above result shows that immediate interruptions are significantly different from negotiated interruptions. It supports hypothesis H1.1 in that negotiated interruptions affect driving performance differently than immediate notifications. In summary, during negotiated interruptions, participants used the throttle less than during immediate interruptions, likely because the user was comfortable devoting more attention to the secondary task.

H1.2 Response time and negotiated interruptions

Hypothesis H1.2 stated that individuals would answer the math question more quickly following a negotiated style notification than an immediate style notification. This was the case: the average time to answer to answer a math question after it was vocalized was 4.05 s for direct interruption and 3.50 s for pager and phone interruptions (F[1,567]=4.558, p=.033).

H2 Individual Differences, Preferences and Driving Performance

H2.1 Preferences and Individual Differences

The mean preferences regarding the notifications was neutral in each case (direct, pager, phone; with standard deviation = 1.41, .638 and .798, respectively). There was a sizeable negative correlation between the Likert ratings for preferences regarding pager vs. direct communication respectively (r=-.606, p=.005). There were no significant differences between individual difference groups. (See Appendix L.)

When answering the background questionnaire, participants volunteered additional explanations to qualify their choices. The immediate interruptions were seen as positive in the sense that there was no extra load of answering to a ring or tone. On the other hand, the immediate interruption demanded instantaneous attention which was difficult during challenging road conditions or while passing another car. The phone was seen more negatively as an interruption device than the pager in the sense that there was less time to answer. While the pager was seen positively because of the ample time to respond, its sound was considered loud and disruptive.

H2.2 Secondary Task Performance and Individual Differences

H2.2.1 Response time to negotiated interruptions

Discriminant analyses were performed using response time to ringing or beeping. Three discriminant analyses were carried out, each analyzing the differences between the two groups (high versus low) for one of the individual differences measures.

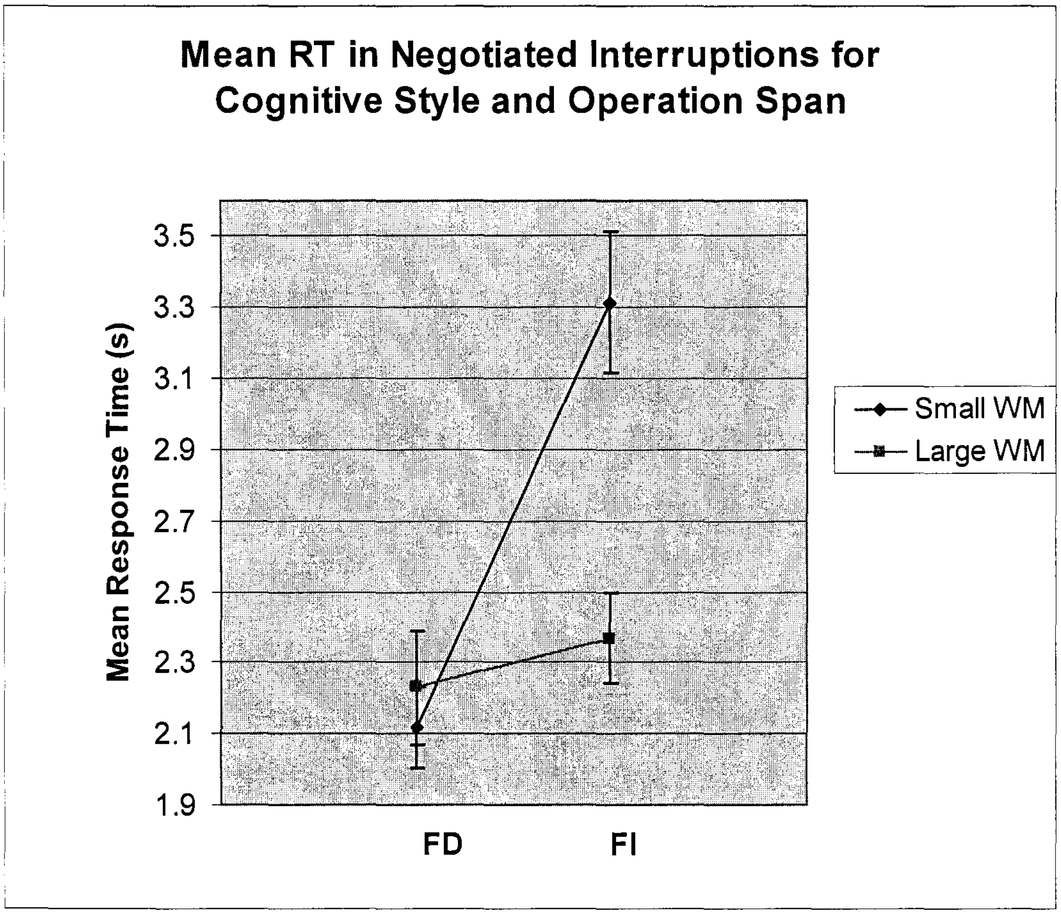
Field dependents were shown to answer pager and phone calls more quickly than independents (2.880 s, 2.180 s, F[1,394]=17.469, p<.001). This result supports hypothesis H2.2.1.

Those with a larger operation span responded more quickly than those with smaller operation span (a mean of 2.83 rings vs. 2.30, F[1,392]=10.901, p=.002). This result was not predicted in the hypotheses but is consistent with a faster decision making process. Those with high desire for control answered more quickly than those with low desire for control (2.283s, 2.912s F[1,392]=14.011, p<.001). This effect was also not predicted in the hypotheses since it was expected (based on the definition of the construct) that high desire for control individuals would be more comfortable letting the phone ring until they felt ready to answer it..

ANOVAs were performed in order to investigate the effects of combinations of individual differences. A univariate ANOVA showed an interaction between cognitive style and working memory in terms of time taken to respond to calls.

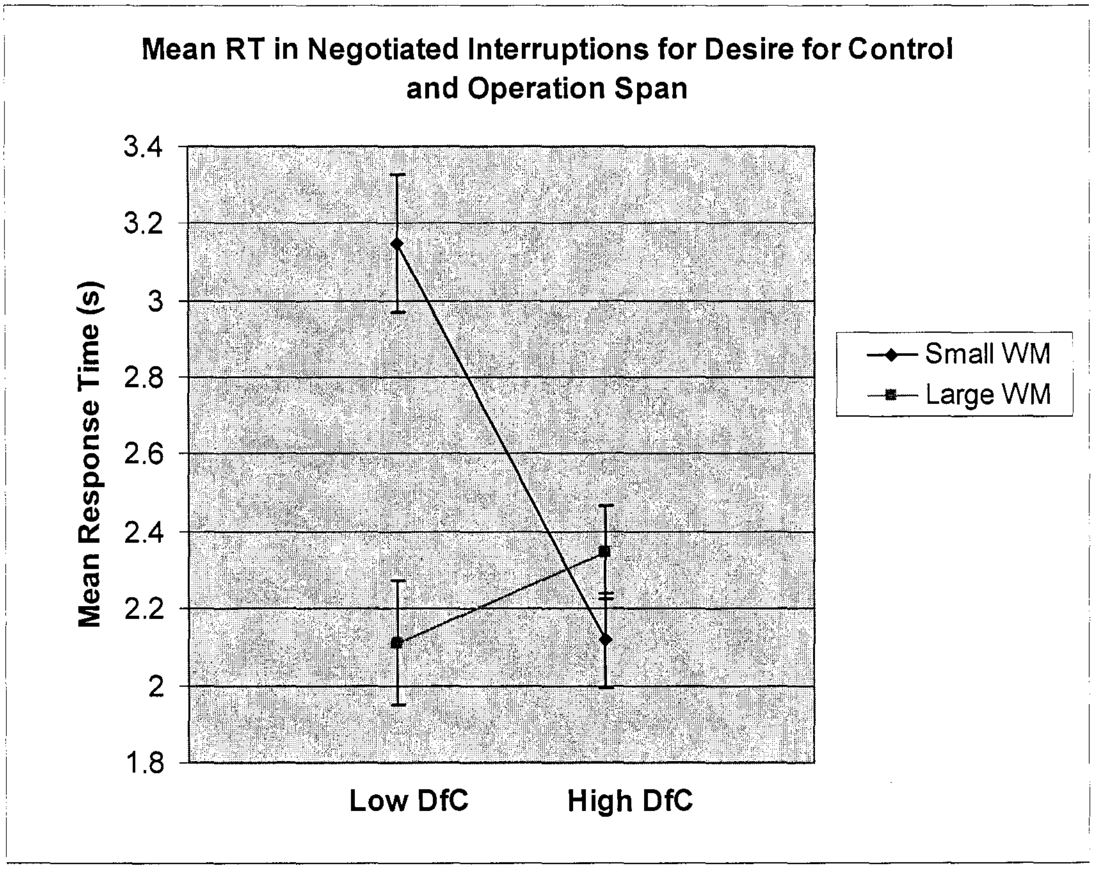
Those who were field independent with a small operation span took the most time to respond to negotiated notifications (F[1,392]=13.975, p<.001; see Figure 8). This result is consistent with H2.2.1 which anticipated that field independents would take longer to answer in general. Since H2.2.2 expected that those with a larger working memory engaged in faster decision-making, it is consistent with the finding that those who are field independent with a low operating span were slowest to answer the ringing.

Figure 8.



An interaction was also found between desire for control and operation span. Those with a small operation span and low desire for control took the most time to respond to negotiated notifications, while those with a small operation span and high desire for control took the least (F[1,392]= 17.423, p<.001; see figure 9)

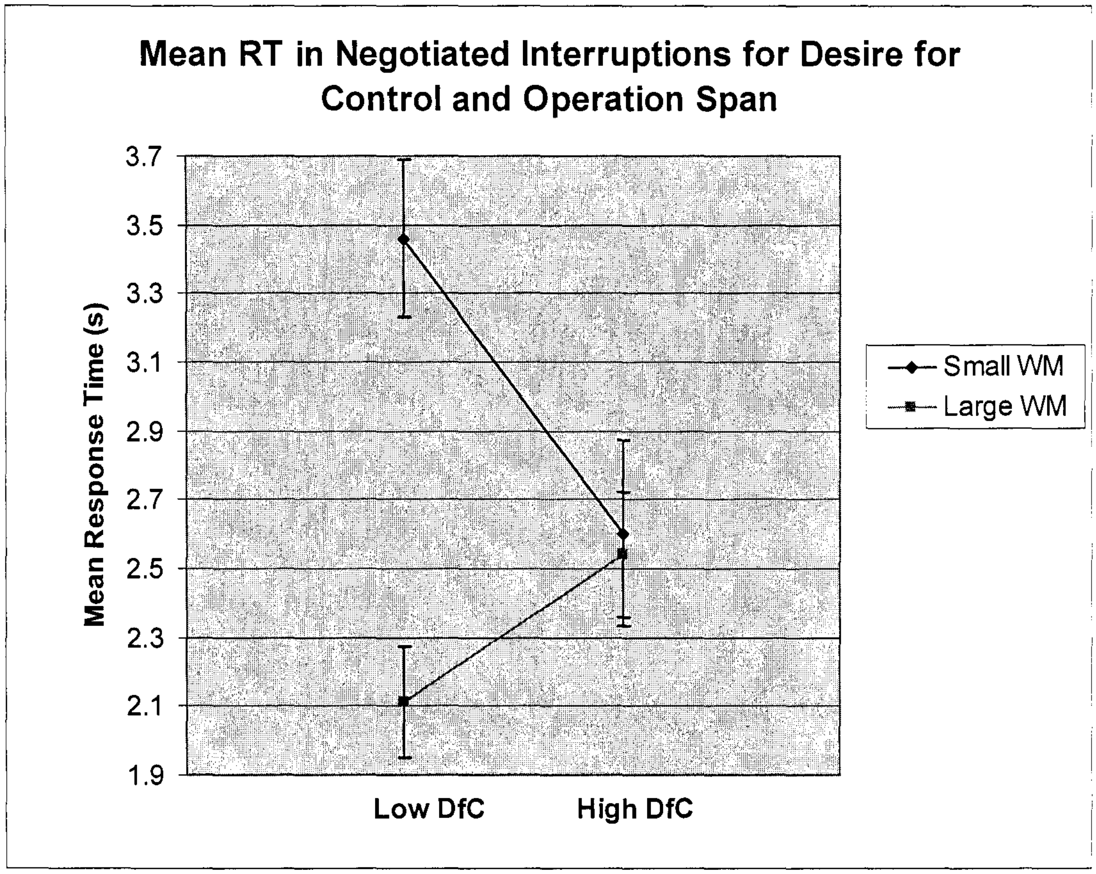
Figure 9.



The working memory and desire for control (DfC) effect resembles a mirror image of the previous chart. This may be due to the negative correlation between DfC and cognitive style. The effect of cognitive style can be partitioned out by looking at DFC and plotting the relationship for field independents only (See figure 10). When looking only at field independents, we see that high desire for control contributes to a moderate response time.

In contrast, those with low desire for control and high operation span answer quickly while those with a smaller operation span take the longest to respond (F[1,213]= 5.099, p=.025; see Figure 10.) Following again from H2.2.2, those smaller operating spans (and with low desire for control) take longer to respond.

Figure 10.



Looking at this effect for those with small operating span, high desire for control influences individuals to speed up their response time, while for those with large operating span, high desire for control slows the average response time. The effect concerning those with high operation span is consistent with the expectation that those high in desire for control would be more comfortable letting the phone ring until they felt ready to answer it.

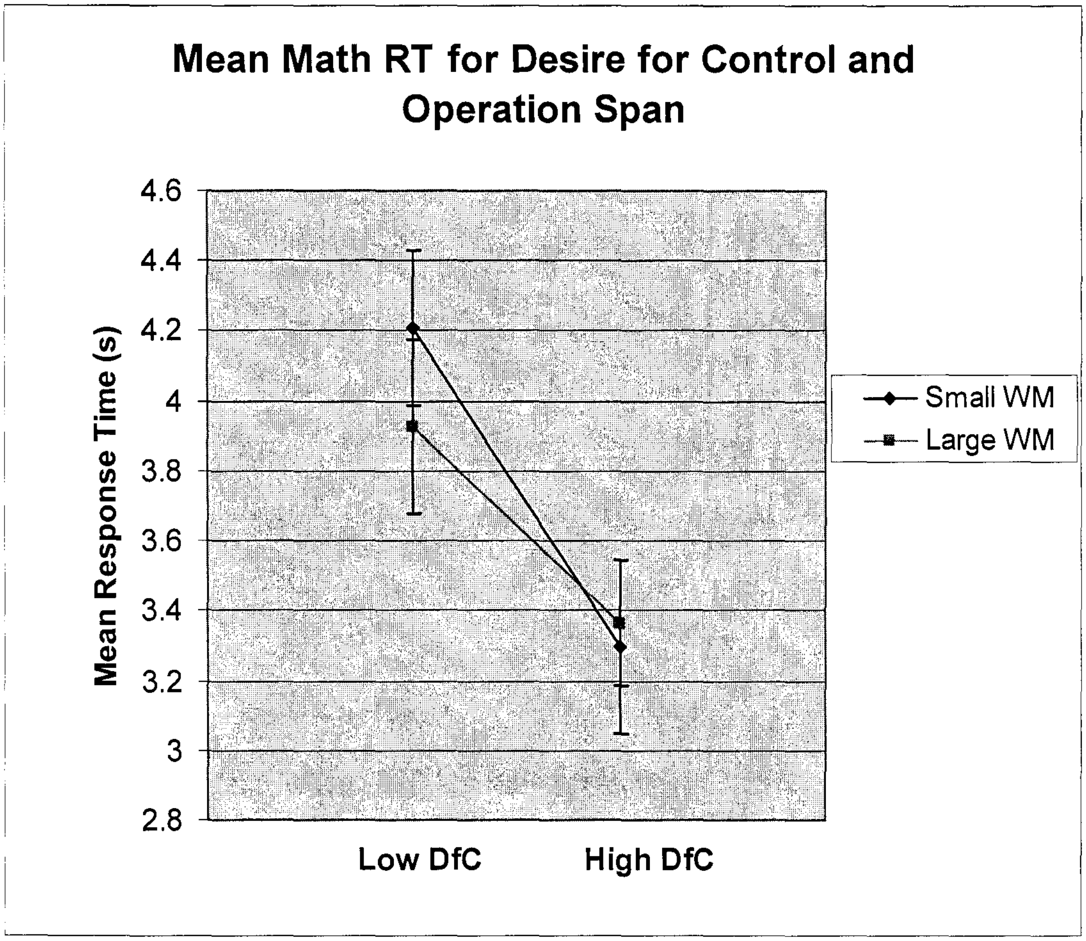
high in desire for control would be more comfortable letting the phone ring until they felt ready to answer it.

H2.2.2 Response to mathematical questions

Discriminant analyses were performed using math question response times and accuracy to predict membership in the high or low group for the individual differences measures. H2.2.2 was partially confirmed: those with large operating spans answered the math questions more quickly than those with smaller operating spans (3.480 s, 3.932 s, F[1,567]=3.889, p=.049). However, the discriminant analysis showed no overall multivariate relationship between the high-low working memory group and accuracy on the math questions. However, there was a non-significant trend for those with larger operating span to more accuracy in the mathematical questions (low operation span m=.18, high operation span m=.13, F[1,594]= 2.634, p=.105).

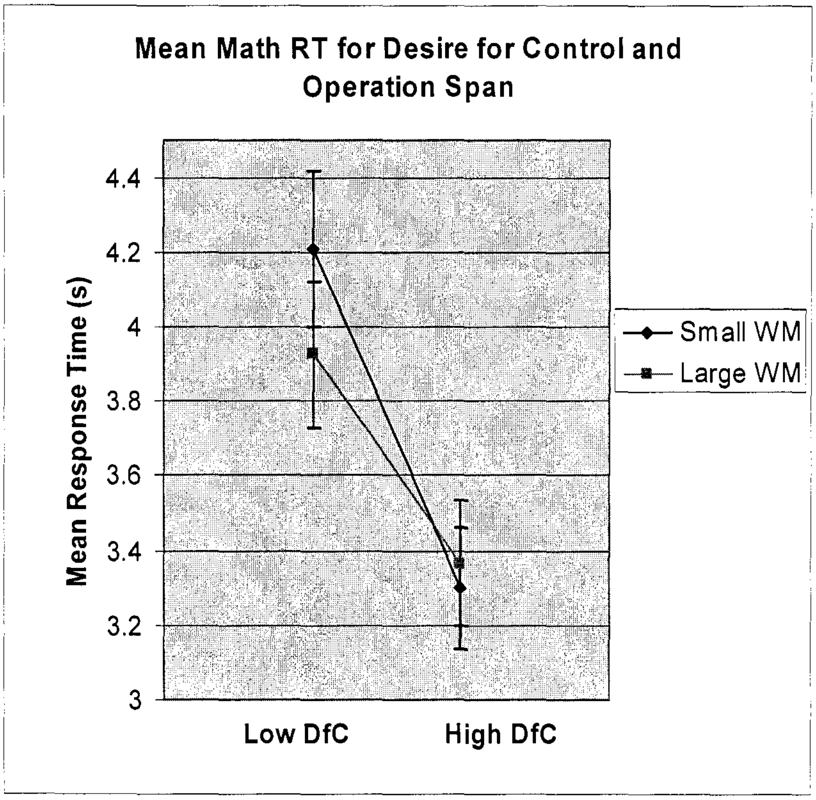
The other individual differences revealed effects pertaining to the math questions. Field independents answered the math questions more quickly than dependents (3.468 s, 3.998 s, F[1,567]=5.300, p=.022). Those with high desire for control answered the math questions more quickly than those with lower desire for control (4.143 s, 3.350 s, F[1,567]=12.080, p=.001). There was a trend that they were more accurate with an average of 2.80 question answered incorrectly versus 4.37 questions answered incorrectly (F[1,567]=3.451, p=.064).

ANOVAs were performed to investigate interactions between the individual differences. There was a significant interaction between operation span and desire for control in terms of math question response time (F[1,590]=12.138, p=.001; see figure 11). Participants with a small operation span and low desire for control took the most time to respond to math questions, while all those with a high desire for control took the least. A large working memory seems to give a small advantage. It follows from previous analyses that the combination of large working memory and high DfC would contribute to the fastest performance. (Figure 11 below.)



It is interesting to underline that those high in DfC and large operating spans are faster at reacting to both ringing math questions, while field independents are slower at answering ringing and faster with math questions.

ANOVAs were performed to investigate interactions between the individual differences. There was a significant interaction between operation span and desire for control in terms of math question response time (F[1,590]=12.138, p=.001; see figure 11). Participants with a small operation span and low desire for control took the most time to respond to math questions, while all those with a high desire for control took the least. A large working memory seems to give a small advantage. It follows from previous analyses that the combination of large working memory and high DfC would contribute to the fastest performance. (Figure 11 below.)



Individual Differences and Driving Performance

For each of the individual differences, the on-call versus off-call differences are compared, the stages of the on-call period are compared, and the immediate versus negotiated interruptions are compared. Assessment of on and off call performance reveals how individual differences impact interruption-related behaviours. Examination of different stages of the call reveals more subtle performance differences. Finally, a comparison of call types assesses H2.2.3, H2.2.4 and H2.2.5. The results are presented in a summary table (see Table 9).

Table 9.
Effect sizes for significant differences* in driving performance (direction** of the effect in parentheses, and refers to 'high' scoring group***)

	Cognitive Style (H2.2.3)			Working Memory (H2.2.4)			Desire for Control (H2.2.5)		
Performance Measure	**Off-call / On-call**	**Answer/ Recovery**	**Imm. / Neg.**	**Off-call / On-call**	**Answer/ Recovery**	**Imm. / Neg.**	**Off-call / On-call**	**Answer/ Recovery**	**Imm. / Neg.**
RMS longitudinal acceleration (ft/s^2)					*.179(+/-)*			.235(+/++)	*.185(/+)*
RMS lateral acceleration (ft/s^2)		.315(+/-)							
RMS acceleration due to throttle (ft/s^2)					.257(+/-)	.381(+/-)[2]	.320(+/++)		
SD longitudinal acceleration (ft/s^2)			.210(-/)[1]					.206(+/++)	
SD lateral acceleration (ft/s^2)		.314(+/-)							
SD acceleration due to throttle (ft/s^2)			.296(-/)			.328(+/-)			.277(/+)
Acceleration due to brake (ft/s^2)									*.188(/-)*
RMS steering angle (°)		.315(+/-)							
Heading error (°)					*.184(-/- -)*			*.169(+/+)*	

* Effects are $p < .05$, italicized effects are $p < .10$.
** '+' indicates moderately higher, '++' indicates significantly higher.
***Example 1) *field independents* had *less* variability in their longitudinal acceleration during *immediate* interruptions (effect size = .210).
***Example 2) those with *large working memory* had *more* acceleration due to throttle during *immediate* interruptions and *less* during *negotiated* interruptions (effect size = .381).

Table 9 represents a summary of the size of the significant effects of driving performance surrounding interruptions. For a full report of the results (including graphs) see Appendix T. A summary of this table is provided in the next section: Results Summary.

The interactions for individual differences for driving performance are shown in Table 10.

Table 10. Effect sizes for significant differences* in driving performance (direction of the effect in parentheses++, refers to group in last column)

Performance Measure	Off-call / On-call	Answer/ Recovery	Imm. / Neg.	Group
RMS lateral acceleration (ft/s^2)	.268(+/++)			High DfC-Large WM
SD lateral acceleration (ft/s^2)	.266(+/++)			High DfC-Large WM
RMS steering angle (°)	.318(/--)			Low DfC-Large WM
RMS vehicle curvature (rad)	*.237(/--)*			Low DfC-Large WM
Heading error (°)		.214(-/-)		Low DfC-Large WM
RMS lateral acceleration (ft/s^2)		.280(-/+)		Low DfC-FD
SD lateral acceleration (ft/s^2)		.297(-/+)		Low DfC-FD
RMS steering angle (°)		.240(-/+)		Low DfC-FD
RMS longitudinal velocity (ft/s)		*.174(-/)*		Low DfC-FD
RMS acceleration due to throttle (ft/s^2)			.319(+/-)	Low DfC-FD
RMS acceleration due to throttle (ft/s^2)		*.170(/+)*		High DfC-FD
Minimum time to collision (s)		.211(-/)		FI-Large WM
RMS acceleration due to throttle (ft/s^2)		.200(-/+)		FD-Small WM
RMS acceleration due to throttle (ft/s^2)			*.224(+/)*	FD-Large WM

* Effects are $p < .05$, italicized effects are $p < .10$.

** '+' indicates moderately higher, '++' indicates significantly higher.

Table 10 represents a somewhat simplified summary of the interaction effects of driving performance surrounding interruptions. Only the most salient feature of the interaction is reported here. For a full report of the results (including graphs) see Appendix T. A summary of this table is provided in the next section: Results Summary.

Collisions

There was a correlational trend between cognitive style and number of collisions, where the higher an individual's GEFT score, the fewer collisions ($r= -.421$, $p=.065$).

When field independents with large operation span are labeled as low risk individuals, and others are labeled as high risk, there is a significant effect on total number of collisions (including off-road accidents; with an average of 7 collisions for the low risk group and 14 for the high risk group; $F[1,18]=5.884$, $p=.026$; see Appendix for details).

Learning Effects

A regression analysis was performed relating the interruption number to performance, in order to assess the change in performance over the course of the study. There were some significant changes in performance as participants received more interruptions (See Table 10).

Table 10. Correlations between Driving Performance and Interruption Number

Performance Variable	Pearson Correlation with Interruption Number	Significance (1-tailed)
Minimum Time To Collision	-0.053	0.098
Longitudinal Velocity	0.1055	0.005
Lateral Velocity	-0.063	0.0619
Vehicle Curvature	-0.105	0.0053
Heading Error	-0.104	0.0057
Steering Angle	-0.081	0.0249

The regression analysis showed that as participants experienced more interruptions (numbered from 1 to 30), they increased their forward velocity and decreased their vehicle curvature, heading error and steering angle. The trends indicate that participants also decreased their time to collision and lateral velocity (See Appendix P for further interpretation).

Results Summary

Table 11 provides a summary of the results.

Table 11. Hypotheses (bolded) and Results for Individual Differences and Performance

	Negotiated interruptions	**Immediate interruptions**	**Mathematical questions**
Cog. Style	**H2.2.1: FD** **Faster RT for ringing** • FD: Faster RT for ringing **H2.2.3: FD** **greater perf. decrement** • No significant differences	• FD: Greater SD in longitudinal acceleration • FD: Greater SD in acceleration due to throttle	• FI: Faster RT

	Negotiated interruptions	**Immediate interruptions**	**Mathematical questions**
WM	• Large WM: Faster RT for ringing	**H2.2.4: Large WM** **less perf. impact** • Large WM: More acceleration due to throttle • Large WM: Greater SD in acceleration due to throttle	**H2.2.2: Large WM** **faster RT,** **more accurate** • Large WM: Faster RT • Large WM: Trend for greater accuracy

	Negotiated interruptions	**Immediate interruptions**	**Mathematical questions**
DfC	• High DfC: Faster RT for ringing **H2.2.5: High DfC** **less perf. impact** • High DfC: Greater SD in acceleration due to throttle • High DfC: Trend toward more acceleration due to throttle • High DfC: Trend toward less neg. acceleration due to brake		• High DfC: Faster RT • High DfC: Greater accuracy

Interruption Type

During immediate interruptions, participants had more throttle acceleration.

During negotiated interruptions, participants responded to math questions more quickly and accelerated less. Participants slowed down more for pager calls.

Interruption State

Participants had a lower time to collision during the recovery period. Trends during the listening and answering periods showed lower lateral acceleration, slower speed and little variability in lateral acceleration.

Cognitive Style

Field dependents answered ringing and beeping more quickly, and math questions more slowly. There was a trend for dependents to have more collisions.

Field dependents had little lateral acceleration, and movement (shown by steering angle) during the listening and answering phases and much more during recovery. For immediate interruptions, dependents had considerably more variability in their forward acceleration, shown by the standard deviation in longitudinal acceleration and throttle use. The effects suggest that dependents are more reactive at the start of interruptions and between the stages of interruptions.

Operation Span

Those with large operating span answered ringing and math questions more quickly and tended to answer more accurately.

The large WM group accelerated less as the interruption proceeded and their heading error was significantly reduced when compared to those with low operation span. Those with large operation span accelerated more during direct interruption and the least during pager calls, as shown by greater variability of acceleration due to throttle and throttle use. The immediate interruption behaviour is likely more similar to the off-call behaviour because participants had no control to choose when to answer. The behaviour during negotiated interruptions may be less responsive because participants have chosen to answer at a less-demanding time. Thus, those with large operation span used the period of ringing/beeping to choose the best time to answer the call. In other words, those with high WM chose to answer pagers when little throttle responsiveness was needed so that they were able to focus more on the secondary task.

Desire for Control

Those high in DfC were faster with answering the ringing and beeping, and faster and more accurate with their math responses. During interruptions, the high DfC group maintained a high throttle usage while those low in DfC used the throttle much less.

As the interruptions proceeded, the high DfC group increased their acceleration with high responsiveness, and a trend shows that they also increased their heading error as interruption progressed. During negotiated interruptions, the high DfC group had more variability in their throttle use and a trend towards responsive acceleration and less braking.

Interactions of Individual Differences

Those with high operation span and low desire for control took longer to answer math questions. During interruptions, they had a lower steering angle and a trend towards less vehicle curvature. During the answering and recovery phases of interruptions, they reduced their heading error the most.

A trend existed where those with small operation span and low desire for control took longer to answer ringing and accelerated the least during immediate interruptions. Those with high operation span and high desire for control answered math questions quickly. Looking at field independents with with high operation span only, those high DfC took more time to answer ringing, while other groups with high DfC took less time.

During the listening and answering phases of the interruptions, field dependents with low DfC had the lowest lateral acceleration, as shown by measures of lateral acceleration, standard deviation of lateral acceleration and steering angle. There was a trend that showed that they had the lowest velocity too. During direct interruptions, the low-DfC-FD group used the throttle more, and during pager interruptions, they used the throttle less. These effects suggest that field dependence magnifies the non-aggressive driving style of those with low desire for control. However, field dependents remain highly reactive regardless of desire for control, and those high in desire for control remain aggressive regardless of cognitive style.

Field dependents with large operating span accelerated the most during immediate style interruptions. FDs with small operation span accelerated the least during the listening and answering portions of all interruptions, and the most during the recovery. This effect is consistent with the one above in that dependents with small operating spans tend to reduce their speed to be able to focus their mental resources on listening to the mathematical question.

Field independents with large operating span consistently had the smallest time to collision, especially during immediate interruptions. This suggests that field independents with large operating span need less distance between themselves and other vehicles to operate safely, as shown by this groups' lower incidence of collisions. Field independents with small operating span took longest time to answer ringing.

5. DISCUSSION

The differences in the off-call driving performance as compared to during interruptions were that participants: drove faster, were more centred in their lane, and had a lower time to collision. A lower time to collision means that drivers are closer to the threat of a collision. However, it can be interpreted that they are putting themselves in this position because they have more attentional resources to devote to controlling their driving.

The ringing phase of interruptions gives participants more preparation to better deal with interruptions as shown by their faster responses to the math questions. The higher acceleration due to throttle for the immediate interruptions may be due to the lack of time/warning to slow down, that the negotiated interruptions provide. Participants slowed down the most for pager interruptions. Qualitatively, participants found the pager interruptions to be most difficult, and the pager beeping sound to be more annoying than the phone sound. Participants were used to the sound of the phone, and it likely better fit the mental model of an in-vehicle interruption.

Dependents tended to be highly reactive: they answered negotiated calls more quickly and had more variability in their forward acceleration. In contrast, they answered math questions more slowly. Their driving performance suffered because of their faster response time – they had a higher number of collisions. Since dependents have less lateral acceleration during listening and answering and more after recovery, it seems that they quickly switched their focus from the interruption back to driving: they have less lane changes during interruptions and more instantly afterwards. In contrast, field independents with small operating span took longest time to answer ringing. This is due to a combination of poorer mental ability and less reactivity.

Those with high desire for control tended to be aggressive drivers in terms of lane changing, more acceleration and less braking. Faster responses in ringing and math question response time, and more accurate answers points to an eagerness to perform well, as established in the literature (Burger, 1992). A closer investigation found that, in constrast to the high-DfC small-WM group, the high DfC-large WM waited longer to answer calls. It is likely that this group preferred the control of determining when to answer.

During interruptions, those with high operation span and low desire for control acted less rushed in terms of driving behaviour: they took longer to answer mathematical questions and changed lanes less often. The combination of less need for control of the operation of the vehicle and more mental resources allowed for safer decision regarding vehicle activity, as shown by their reduced heading error. The rapidity lended to participants through large working memory and the relaxed manner of those low in desire for control is shown through this group slow response to the ringing portion of interruptions. The opposite is shown for the fastest math answers from those with a large working memory and high desire for control.

Field dependents with low desire for control tended to change lanes less often and drive more slowly.

Those with large operating span drove with more exactitude: they had fast accelerations and lower heading error. Those with large WM seemed to engage in more accurate decision-making: their performance during negotiated calls was less varied and surer, likely reflecting an appropriately selected lull in the driving scene in which to answer a call. Those with larger working memory were faster at completing the secondary task as shown by their fast response times to the ringing and math questions.

Field independents with small operating span and field dependents with large operating span tend towards a less risky vehicle position during challenging portions of the interruptions: they held larger safety buffers in term of time to collision during the listening phase and reduced it during recovery phase. The disadvantage of some of the high reactivity (and errors) that happened with the field dependent cognitive style seemed offset by a larger working memory. This group had the reactivity and choice to slow down for the listening and answering phase of interruptions.

Field independents with large operating span were the most conservative with their buffer space since they had the smallest time to collision. These are the top performers in terms of cognitive skills and need a smaller buffer in order to operate at the highest level of safety: they had significantly fewer collisions.

The learning effects show better performance as participants experience more interruptions: they were better able to deal with faster speeds with a smaller safety zone while limiting unnecessary vehicle curvature and steering angle.

In-Vehicle Notification System Implications

The results from this study may be useful to inform the design of in-vehicle systems to be acceptable for all individual differences, or inform system personalization or customization based on personal variables. Relevant to everyone are in-vehicle systems such as GPS that tend to announce directions such "left turn up ahead" without a warning signal. All cognitive types benefited from a warning signal, and thus it is recommended that all messages (except for critical message) be presented with warning, so that the user can select when to hear the message.

As for specific tailoring recommendations, field dependents may benefit from an intelligently delayed message warning, since that group is most likely to respond quickly to warning signals. Here, intelligent refers to a delay until the road conditions and other situations are minimally complex in order to allow mental focus on the interruption without unsafe consequences. Other groups would benefit from warning signals at the same time as message reception.

Immediate style interruptions were seen to be particularly dangerous for field dependents with low operation span. This group would have the high reactivity to respond to notifications right away, and would tend not to consider the option of answering in a few seconds. A field dependent style or low operation span combined with high desire for control may be particularly prone to danger, as the tendency for aggressive behaviour would be unmatched by cognitive abilities that would allow the individual to interact with the environment safely at an aggressive pace. Those with lower desire for control are safer even if they have fewer mental resources because they tend to drive at a slower pace.

Study Scope and Limitations

The author attempted to balance internal and external validity in this study. Standard measures were used for assessing the cognitive variables which strengthens the study. The STISIM driving simulator uses validated models for vehicle behaviour, and has been used in many other studies. Elements in the experimental design were counterbalanced and randomized as much as possible, while allowing for equal number of events. However, due to this randomness, some groups experienced marginally more curves during interruptions than others. Another potential confound between immediate and negotiated interruption is the mechanical movement of the hand from the side to the centre of the steering wheel in order to press the mouse button. Prior research on hands-free versus regular cell phones finds that such mechanical movements are not significantly deleterious. It would be desirable for researchers in future to repeat this study with a response button that did not require significant hand movement in order to control for the possible effect of hand movements on how the task was performed in the different experimental condition

The mathematical questions following the interruptions reduced external validity, but maintained a strong internal validity in have standard times and semantic and emotional content associated with each of the interruptions.

The external validity of the interruption noise was strong as the phone and pager sounds were naturalistic. The driving simulator is a standard in academic settings, but the experience is closer to a video game than to real driving. This potential weakness in external validity is treated in the sense that the next major research step coming out of this research is replication in a field trial.

6. CONCLUSION

Summary

A mixed design (between and within-subjects) study was conducted. During a 30-minute driving task, participants were interrupted 30 times by direct, phone and pager calls that were followed by a mathematical question. Field dependents answered the ringing or beeping more quickly and math questions more slowly, and suffered poorer driving performance in terms of lane centrality and collisions. Those high in desire for control answering ringing and math questions more quickly, and were overall more aggressive drivers with more throttle and brake use. Those with large working memories answered ringing and math questions quickly while maintaining more precise driving. A large working memory offset any performance decrements associated with field dependence and low desire for control.

Contributions

The methodological contribution of this study centers around the setup of the immediate versus negotiated interruptions. The mouse input setup and java program output allowed for a quasi-randomized interruption sequence that was subsequently matched to driving performance data.

The novelty of the topic of this study was notable. Research in driving often strives to pinpoint the behaviour equivalent to the common denominator among people, while this study researched potentially interested differences and investigated them in depth.

Empirically, this study contributed knowledge on immediate versus negotiated interruptions. Similarly to McFarlane (2002), negotiated interruptions were generally better received than immediate interruptions. It is a novel combination to assess individual differences and interruptions in driving performance. I found that individual differences affected the handling of interruptions. The findings regarding the more easily distractible field dependents support previous research (Jolly & Reardon, 1985). The results concerning working memory follow the same direction of earlier studies in which those with higher capacities perform better on cognitive tasks (cf. Norman & Bobrow, 1975). The examination of Desire for control in driving is novel: its affect on driving style and interruption behaviour was notable.

Further research should be done to replicate these results in order to strengthen their validity. In terms of deeper investigations, an in-vehicle study may be warranted in order to examine the relative effects of cognitive style, desire for control and working memory in an externally valid setting. Contributions from this type of study may be used in the insurance section to aid in quantifying the relative risk of collision.

Final Points

Immediate style interruptions are particularly dangerous for field dependents with low operation span, as shown by this group's higher likelihood to crash. They would have the high reactivity to respond to notifications right away, and would tend not to weigh the option of answering in a few seconds. A field dependent style or low operation span combined with high desire for control may also be prone to danger, as the tendency for aggressive behaviour would be unmatched by cognitive abilities that would allow the individual to interact with the environment safely at an aggressive pace. Those with lower desire for control are safer even if they have fewer mental resources because they tend to drive less aggressively.

The findings from this study should help in understanding how different notification policies can be tailored to individuals. Specifically, the results may be used to inform models of human interruptibility. Currently such models are focused on user activities, with weighted terms corresponding to likelihood of interruptibility given that the user is typing, engaged in a conversation, or has their eyes closed (e.g., Hudson et al. 2003). The individual difference factor could be an additional weighted term in the equation determining when and how to interrupt a user. Accounting for individual differences has the potential to create notification policies that are personalized to the individual. Better accuracy in the decision of when and how to interrupt can increase the productivity and satisfaction of the user.

7. References

Anderson, J. (1988) An investigation of Type A behaviour, need to control, perceptions of loss of control, and severity of coronary artery disease. Dissertation, University of Pennsylvania, Pennsylvania, Unites States, http://repository.upenn.edu/dissertations/AAI8816305/ (Accessed April 2005)

AT&T free online demo text-to-voice software. http://www.research.att.com/projects/tts/demo.html (Accessed March 2005)

Audacity, free sound editor. GNU General Public License (GPL). http://audacity.sourceforge.net/ (Accessed March 2005)

Awh, E., Serences, J., Laurey, P., Harpeet, D., van der Jagt, T., Dassonville, P. (2004) Evidence against a central bottleneck during the attentional blink: Multiple channels for configural and featural processing. *Cognitive Psychology, 48*, 95-126.

Bandura, A. (1994) Self-efficacy. In V. S. Ramachaudran (Ed.), Encyclopedia of human behavior (Vol. 4, pp. 71-81). New York: Academic Press.

Baran, M. (2005) Individual Differences in Notification Management, Unpublished masters thesis, University of Toronto, Toronto, Ontario, Canada.

Bates, M. (1989) The design of browsing and berrypicking techniques for the online search interface. *Online Review, 1,* 407--424.

Bates, M. (1990) Where should the person stop and the information search interface start? *Information Processing and Management, 26,* 575-591.

Bennink, C. D., Spoelstra, T. (1979) Individual differences in field articulation as a factor in language comprehension. *Journal of Research in Personality, 13,* 480-489.

Bernardelli, A., de Stefano, J., Dumont, F. (1983) Occupational information-seeking as a function of perception of locus of control and other personality variables. *Canadian Counsellor, 17(2),* 75-81.

Bodner, R., Chignell, M., Charoenkitkarn, N., Golovchinsky, G., Kopak, R. (2001) The impact of text browsing on text retrieval performance. *Information processing and Management, 37,* 507-520.

Bonnel, A. M., Hafter, E. R. (1998) Divided attention between simultaneous auditory and visual signals. *Perceptual Psychophysics, 60(2),* 179-190.

Brackstone, M. (2003) Driver psychological types and car following: is there a correlation? Results of a pilot study. *Proceedings of the 2nd International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design*, 245-250.

Broadbent, D. E. (1958) *Perception and communication.* Pergamon Press, London.

Burger, J. M. (1992) *Desire for Control: Personality, Social, and Clinical Perspectives.* New York: Plenum Press.

Casson, R.W. (1983) Schemata in Cognitive Anthropology, *Annual Review of Anthropology, 12*, 429-462.

Cherry, E.C. (1953) Some experiments on the recognition of speech, with one and with two ears. *Journal of the Acoustical Society of America, 25(5),* 975-979

Choo, C. W., Detlor , B., Turnbull, D. (2000) Information Seeking on the Web: An Integrated Model of Browsing and Searching. *First Monday, 5(2).* URL: http://firstmonday.org/issues/issue5_2/choo/index.html (Accessed April 2005).

Conway, A., Engle R. (1996) Individual differences in working memory capacity: More evidence for a general capacity theory. *Memory, 4*, 577-590.

Cutrell, E. B., Czerwinski, M., Horvitz, E. (2004) Effects of Instant Messaging Interruptions on Computing Tasks. *Interactive Paper CHI*, 99-100.

Davis, J. K., Frank, B. M. (1979) Learning and memory of field independent-dependent individuals, *Journal of Research in Personality, 13,* 469-479..

Dembroski, T. M., MacDougall, J. M., Musante, L. (1984) Desirability of control versus locus of control: relationship to paralinguistics in the type A interview, *Health Psychology, 3(1),* 15-26.

Deutsch, J., Deutsch, D. (1963) Attention: Some theoretical considerations. *Psychological Review, 70*, 80-90.

Drozda-Senkowska, E. (1982) Locus of control and perception of unexpected information. *Studia Psychologiczne, 20(2),* 89-99.

Durso, F. T., Reardon, R., Jolly, E. J. (1985) Self-nonself segregation and reality monitoring. *Journal of Personality and Social Psychology*, *48*, 447-455.

Endsley, M. R. (2001) Designing for situation awareness in complex systems. *Proceedings of the Second International workshop on symbiosis of humans, artifacts and environment*, Kyoto, Japan.

Flynn, E. A., Barker K. N., Gibson J. T., Pearson R. E., Berger B. A., Smith L. A. (1999) Impact of interruptions and distractions on dispensing errors in an ambulatory care pharmacy, *American Journal Health System Parma, 56,* 1319-1325.

Fitts, P. M. (1954) The information capacity of the human motor system in controlling the amplitude of movement. *Journal of Experimental Psychology, 47*, 381-391.

Francis, G., Neath I, MacKewn, A., Goldwaite D. (2004) *Coglab on a CD*. Belmont CA: Wadsworth/Thomson Learning.

Garner, W. R. (1962) *Uncertainty and structure as psychological concepts*. New York: Wiley.

Goldstein, K. M., & Blackman, S. (1978) *Cognitive style: Five approaches and relevant research*. New York: John Wiley & Sons.

Goodenough, D.R. (1976) The role of individual differences in field dependence as a factor in learning and memory. *Psychological Bulletin, 83*, 675-694.

Hirst, W. (1986) The psychology of attention. In J. E. LeDoux and W. Hirst (Eds.), *Mind and brain: Dialogues in cognitive neuroscience.* New York: Cambridge University Press.

Horrey, W. J., Wickens, C.D. (2004) *The Impact of Cell Phone Conversations on Driving Performance: A Meta-Analytic Approach* (Tech. Report AHFD-04-2/GM-04-1). Savoy, IL: University of Illinois, Aviation Human Factors Division.

Hudson, S. E, Fogarty, J., Atkeson, C. G., Avrahami, D., Forlizzi, J., Kiesler, S., Lee, J. C., Yang, J. (2003) Predicting Human Interruptibility with Sensors: A Wizard of Oz Feasibility Study. *CHI letters, 5(1),* 257-264.

Iqbal, S., Adamczyk P., Zheng S., Bailey, B. (2005) Towards an Index of Opportunity: Understanding Changes in Mental Workload During Task Execution, *Proceedings of CHI*, 65.

Jamson, A. H., Westerman, S. J., Hockey, G.R., Carsten, O.M.J. (2004) Speech-Based E-Mail and driver behavior: Effects of an In-Vehicle Message system interface, *Human Factors, 46(4),* 625-639.

Jenkins, C. D., Zyzanski, S. J., Rosenman, R. H. (1976) Risk of new myocardial infarction in middle-aged men with manifest coronary heart disease. *Circulation, 53,* 342-347.

Jolly, E. J., Reardon, R. (1985) Cognitive differentiation, Automaticity, and Interruptions of Automatized Bevaviors, *Personality and Social Psychology Bulletin, 11(3),* 301-314.

Judge, T., Erez, A., Bono, J., Thoresen CJ. (2002) Are Measures of Self-Esteem, Neuroticism, Locus of Control, and Generalized Self-Efficacy Indicators of a Common Core Construct? *Journal of Personality and Social Psychology, 83(3),* 693-710.

Kahneman, D. (1973) *Attention and Effort.* Englewood Cliffs, New Jersey: Prentice-Hall.

Kirmeyer, S. (1988) Coping with Competing Demands: Interruption and the Type A Pattern. *Journal of Applied Psychology. 73(4),* 621-629.

Konstadt, N., Forman, E. (1965) Field dependence and external directedness. *Journal of Personality and Social Psychology, 1,* 490-493.

Kubose, T. T., Bock, K., Dell, G. S., Garnsey, S. M., Kramer, A. F., Mayhugh, J. (2004) The effects of speech production and speech comprehension on simulated driving performance. *Proceedings of the 3rd International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design*, 74-80.

Latorella, K. (1996) Investigating interruptions: An example from the flightdeck. *Proceedings of the Human Factors and Ergonomics Society 40th Annual meeting*, 249-253.

Latorella, K. (1999) *Investigating interruptions: Implications for Flightdeck Performance*, Technical Report NASA/TM-1999-209707, Langley Research Center, Hampton, Virginia.

Lindsay, P. H., Norman, D. A. (1972) *Human information processing.* New York : Academic Press.

Lottridge, D.M., Baran, M., Rodrigues, S., and Chignell, M. (2005) Derivation and Evaluation of the Short-Form Communication Preferences Inventory (CPI). Knowledge Media Design (KMDI) Working Paper, 7 pages.

MacGregor, S. K. (1999) Hypermedia navigation profiles: cognitive characteristics and information processing strategies. *Journal of Educational Computing Research [H.W. Wilson - EDUC]. 20(2),* 189.

Marchionini, G. (1995) *Information Seeking In Electronic Environments.* Cambridge University Press, Cambridge, England.

Martens, K. (1975) *Cognitive style: An introduction with annotated bibliography.* Albany: State University of New York.

McDowd, J. M., Shaw, R. J. (2000) Attention and aging: a functional perspective. In F. I. M. Craik & T. A. Salthouse (Eds.), *The handbook of aging and cognition* (2nd ed., pp. 221-291). Hillsdale, NJ: Erlbaum.

McFarlane, D. C. (1997) *Interruption of People in Human-Computer Interaction: A General Unifying Definition of Human Interruption and Taxonomy* (NRL Formal Report

NRL/FR/5510-97-9870), Washington: US Naval Research Laboratory http://interruptions.net/literature/McFarlane-NRL-97.pdf (Accessed March 2005)

McFarlane, D. C. (2002) Comparison of four primary methods for coordinating the interruption of people in human-computer interaction, *Human-Computer Interaction, 17 (1),* 63-139.

Miller, G.A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review, 63*, 81-97.

Monk, C. A., Boehm-Davis, D., Trafton, G. (2004) Recovering from interruptions: Implications for Driver distraction research, *Human Factors, 46(4),* 650-663.

Murphy, K. R., Myors, B. (1998) *Statistical Power Analysis.* Lawrence Erlbaum Associates, Hillsdale, NJ, USA.

Nielsen, J., Molich, R. (1990) Heuristic evaluation of user interfaces, *Proceedings of the ACM CHI'90 Conf.* (Seattle, WA, 1-5 April), 249-256.

Norman, D.A., Bobrow, D.G. (1975) On data-limited and resource-limited processes, *Cognitive Psychology, 7*, 44-64.

Obermayer, R. W., Nugent, W. A. (2000) Human-computer interaction for alert warning and attentional allocation systems of the multi-modal workstation. Proceedings of SPIE 2000, SPIE-The International Society for Optical Engineering, Bellingham, WA.

Prociuk, T. J., Breen, L. J. (1977) Internal-external locus of control and information-seeking in a college academic situation. *Journal of Social Psychology, 101(2)*, 309-310.

Reardon, R., Rosen, S. (1984) Psychological differentiation and the evaluation of juridic information: Cognitive and affective consequences. *Journal of Research in Personality, 18*, 195-211.

Robertson, T. J., Prabhakararao, S., Burnett, M., Cook, C., Ruthruff, J. R., Beckwith, L., Phalgune, A. (2004) Impact of Interruption Style on End-User Debugging, *CHI Paper 6(10),* 287-294.

Rotter, J. (1966) Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied. 80(1),* 1-28.

Sawhney, N., Schmandt, C. (1999) Nomadic Radio: Scaleable and Contextual Notification for Wearable Audio Messaging. *CHI Paper,* 96-103.

Sheridan, T. B. (2004) Driving Distraction From a Control Theory Perspective. *Human Factors, 46(4),* 587-599.

Shneiderman, B. (1998) *Designing the user interface: Strategies for effective human-computer interaction* (3rd ed.), MA: Addison-Wesley Publishing.

Spearman, C. (1904) General intelligence, objectively determined and measured. *American Journal of Psychology, 15,* 201-293

Thornton, C. (2002) Got Usability? Talking with Jakob Nielsen, *Boxes and Arrows Online Journal*, http://www.boxesandarrows.com/archives/print/002321.php (Accessed Nov. 2005).

Trafton, J. G., Altmann, E. M., Brock, D. P., Mintz, F. E. (2003) Preparing to resume an interrupted task: Effects of prospective goal encoding and retrospective rehearsal. *International Journal of Human Computer Studies, 58,* 583-603.

Treisman, A., (1964) Selective attention in man. *British Medical Bulletin, 20,* 12-16.

Wallston, K. A., Maides, S., Wallston, B. S. (1976) Health-related information seeking as a function of health-related locus of control and health value. *Journal of Research in Personality, 10(2),* 215-222.

Weiner, M. J., Daughtry, T. (1975) Locus of control as a determinant of information seeking. *Personality & Social Psychology Bulletin, 1(3),* 505-508.

Wickens, C.D. (1984) Processing resources in attention. In R. Parasuraman & D.R. Davies (Eds.), *Varieties of attention.* (pp. 63-102). New York, NY: Academic Press.

Wickens, C.D., Hollands, J.G. (2000) *Engineering Psychology and Human Performance*, 3rd Edition. Prentice Hall, Upper Saddle River, NJ.

APPENDICES

Appendix A: Entry Questionnaire

Please select your age group:
- ☐ 18-21
- ☐ 22-25
- ☐ 26-29
- ☐ 30-33
- ☐ 34-36

Gender:
- ☐ Male
- ☐ Female

Are you a native speaker of English?
- ☐ Yes
- ☐ No – Please specify your native language:______________________________

What class of driver's license do you have?
- ☐ None
- ☐ G1
- ☐ G2
- ☐ G
- ☐ Other: Please specify:__________________________________

How long have you been driving?
- ☐ Less than one year
- ☐ 1-3 years
- ☐ 4-6 years
- ☐ 7-10 years
- ☐ 11 years or more

On average, how many hours do you drive per day?
- ☐ None
- ☐ Less than 1 hour
- ☐ 1-2 hours
- ☐ 2-3 hours
- ☐ 3 hours or more

Do you play driving video games?
- ☐ Yes – Please on average, how often you play :______________minutes per day
- ☐ No

Do you currently use a cell phone?
- ☐ Yes
- ☐ No

How long have you been using a cell phone? _____ years

Approximately how many minutes per day do you use a cell phone? ______ minutes

Of the minutes that you speak on the phone, approximately how many minutes are you in a car? ______ minutes

In general, how comfortable are you using a cell phone while driving?
- ☐ Very comfortable
- ☐ Comfortable
- ☐ Neither Comfortable nor Uncomfortable
- ☐ Uncomfortable
- ☐ Very uncomfortable

Do you currently use a pager?
- ☐ Yes
- ☐ No

How long have you been using a pager? _____ years

Approximately how many times per day do you use a pager? ______ times

Of the times that you use a pager, approximately how many times are you in a car? ______ times

In general, how comfortable are you using a pager while driving?
- ☐ Very comfortable
- ☐ Comfortable
- ☐ Neither Comfortable nor Uncomfortable
- ☐ Uncomfortable
- ☐ Very uncomfortable

How often do you use in-vehicle information systems (e.g., in-vehicle DVD players, Global Positioning System/Navigation Systems) while driving?
- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Frequently
- ☐ Always

Are you currently taking any medication or substances that may affect your ability to drive?
(e.g., sedatives, alcohol, etc.)
- ☐ Yes
- ☐ No

How many hours of sleep did you get last night?
______________ hours

Do you have normal or corrected-to-normal vision (i.e., 20/40 or better, with glasses or contact lenses)?

- ☐ Yes
- ☐ No

Appendix B.1: Communication Preferences Instrument- Short Version

Please rate your responses on a scale of 1 to 5:

☐	☐	☐	☐	☐
1	2	3	4	5
Strongly agree	Mildly agree	Agree and disagree equally	Mildly disagree	Strongly disagree

_______ 1. Writing letters to people is inefficient compared to sending email.

_______ 2. The quality of information gained from direct communication is worth the effort of arranging the communication

_______ 3. My personal time is disrupted because it is too easy to be connected to work from home.

_______ 4. I use the Internet to maintain friendships.

_______ 5. I prefer talking with people directly rather than writing an email or text message.

_______ 6. I prefer face-to-face meeting to more indirect forms of communication such as email and text messaging.

_______ 7. I often compose and send messages as things come up.

_______ 8. I often communicate with my friends via the Internet.

_______ 9. I often check my business email or voicemail when I am away from the office outside of work hours.

_______ 10. I keep in touch with friends more now that I can communicate with them via the Internet.

_______ 11. I frequently engage in work-related communications when I am away from the office outside of work hours.

_______ 12. I find it difficult to communicate with a group of people who are in different geographic locations.

_______ 13. I expect my business colleagues to be generally available outside of work hours.

_______ 14. Having a discussion by typing text is inefficient.

_______ 15. Completion of work tasks is faster and better when people communicate directly with speech rather than indirectly using text

CPI short version key:

CMC = 1 + 4 + 7 + 8 + 10

VC = 2 + 5 + 6 + 12 + 14 + 15

WRA = 3R + 9 + 11 + 13

Appendix B.2: Additional Questions on Sending/Receiving Messages

Please rate your responses on a scale of 1 to 5:

☐	☐	☐	☐	☐
1	2	3	4	5
Strongly agree	Mildly agree	Agree and disagree equally	Mildly disagree	Strongly disagree

_______ 1. I tend to answer my phone right away instead of letting it ring.

_______ 2. I prefer to use a phone when I have a message for someone.

_______ 3. I don't like to be interrupted by phone calls.

_______ 4. I like to send text messages on my cell phone.

_______ 5. I like to receive text messages on my cell phone.

_______ 6. I don't care to check who is calling before I pick up the phone.

_______ 7. I prefer to receive incoming messages with a pager.

_______ 8. If I have the option, I like to leave a call-back number or a short message on someone's pager.

_______ 9. I like to receive messages by email.

_______ 10. Email is not the best way to send messages to others.

_______ 11. I prefer to get messages by Instant Messaging.

_______ 12. I value the immediate notification of outgoing messages to others when using an Instant Messaging client.

Appendix C: Desire for Control Questionnaire

Below you will find a series of statements. Please read each statement carefully and respond to it by expressing the extent to which you believe the statement applies to you. For all items, a response from 1 to 7 is required. Use the number that best reflects your belief when the scale is defined as follows:

1 = The statement does not apply to me at all
2 = The statement usually does not apply to me
3 = Most often, the statement does not apply
4 = I am unsure about whether or not the statement applies to me, or it applies to me half the time
5 = The statement applies more often than not
6 = The statement usually applies to me
7 = The statement always applies to me

____ 1. I prefer a job where I have a lot of control over what I do and when I do it.
____ 2. I enjoy political participation because I want to have as much of a say in running government as possible.
____ 3. I try to avoid situations where someone else tells me what to do.
____ 4. I would prefer to be a leader than a follower.
____ 5. I enjoy being able to influence the actions of others.
____ 6. I am careful to check everything on an automobile before I leave for a long trip.
____ 7. Others usually know what is best for me.
____ 8. I enjoy making my own decisions.
____ 9. I enjoy having control over my own destiny.
____ 10. I would rather someone else take over the leadership role when I'm involved in a group project.
____ 11. I consider myself to be generally more capable of handling situations than others are.
____ 12. I'd rather run my own business and make my own mistakes than listen to someone else's orders.
____ 13. I like to get a good idea of what a job is all about before I begin.
____ 14. When I see a problem, I prefer to do something about it rather than sit by and let it continue.
____ 15. When it comes to orders, I would rather give them than receive them.
____ 16. I wish I could push many of life's daily decisions off on someone else.
____ 17. When driving, I try to avoid putting myself in a situation where I could be hurt by another person's mistake.

____ 18. I prefer to avoid situations where someone else has to tell me what it is I should be doing.

____ 19. There are many situations in which I would prefer only one choice rather than having to make a decision.

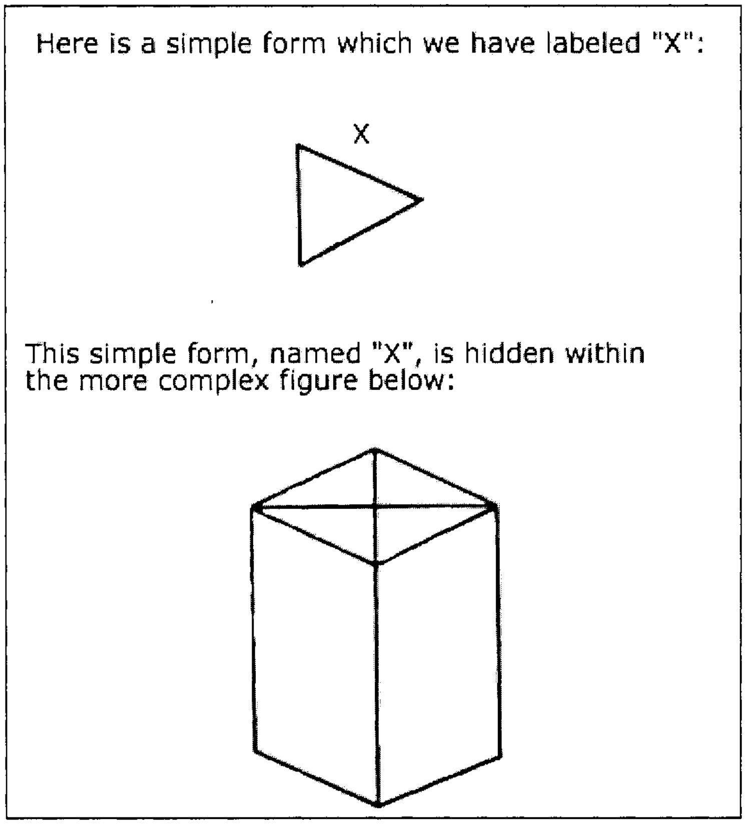
____ 20. I like to wait and see if someone else is going to solve a problem so that I don't have to be bothered with it.

Scoring Key:

reverse # 7,10,16,19,20.
add the 20 values together
means for the scale tend to be around 100, with a standard deviation of about 10.

Appendix D: Group Embedded Figure Test (GEFT)

The GEFT[5] identifies two cognitive styles: field dependent and field independent. It consists of graphical questions that test the ability to find a simple form hidden within a complex pattern. The GEFT contains three sections: the 1st section contains seven simple items to provide practice; the 2nd and 3rd sections contain nine more difficult items. Time limits of two minutes for the first section and five minutes for each of the second and the third sections are set. The reliability coefficient of the GEFT for the second section was found to be .85, and for the third section was found to be .87 (Cronbach's coefficient alpha).



Here is a simple form which we have labeled "X":

This simple form, named "X", is hidden within the more complex figure below:

Figure 1. Example question from the Group Embedded Figures Test (GEFT)

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[5] Oltman, Raskin, & Witkin (1971) *Group Embedded Figure Test.* Palo Alto, CA: Consulting Psychologists Press.

Appendix E: Driving Simulator

The driving simulator is an STISIM model that simulates real driving conditions. There is immediate visual auditory feedback to steering, accelerating and braking actions. The steering is speed sensitive, and there is high fidelity sound processing. The dashboard speedometer indicates current speed. The simulator consists of three monitors (to engage peripheral vision), a steering wheel, a brake/accelerator pedal box, speakers and two CPU towers. The participant will sit in a chair, with the steering wheel and pedal box at appropriate distances (See figure 2).

The driving simulation events program will be shared with Melanie Baran, an MASc candidate from the Interactive Media Lab. The simulations consists of a two way road with variable events that happen at random moments; events occur approximately every 30 seconds. Events consist of easy and difficult curves in the road, passing a lead vehicle, and approaching vehicles in the oncoming lane. Events are programmed into the driving simulator using the Scenario Definition Language (SDL). Events will be programmed on a time based method (as opposed to distance based) so to ensure that drivers experience the same number of events regardless of their driving speed. Further, events are programmed at discrete time intervals as to not overload the driver with multiple simultaneous events. There will be four different driving scenarios that are expected to be equal difficulty. Five participants will be randomly assigned to each driving scenario (i.e. five participants for each of four scenarios; for 20 total participants.) The scenario number will be tested with a statistical analysis to ensure that the scenario is not a confounding variable with the results.

The driving simulator is located in the Bahen building: (40 St. George Street) in room BA8171D. The driving simulator was borrowed from Professor Paul Milgram's lab. It has been loaned to the University of Toronto from Alison Smiley, the president of 'Human Factors North' (http://www.hfn.ca/).

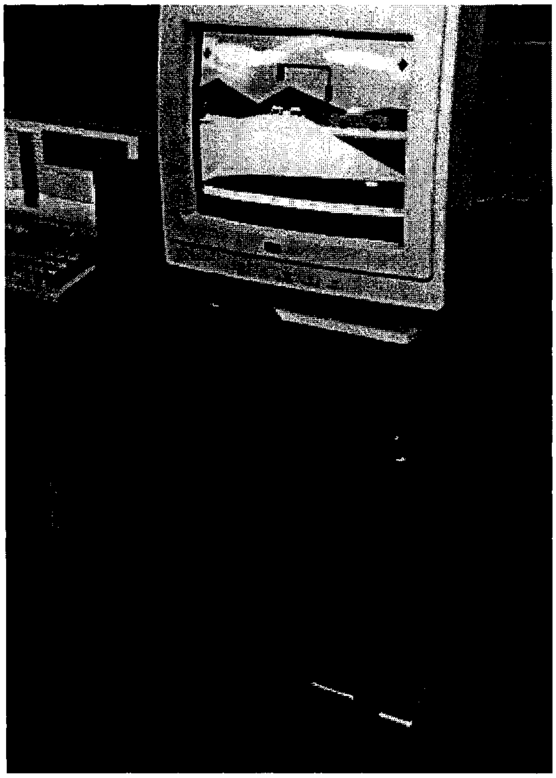

Figure 2: STI SIM driving simulator: Centre monitor, steering wheel and pedal box

Appendix F: Participant Rule Sheet

A minimum of $10.00 is paid for your time in the experiment. Try to drive 55 MPH, stay in the centre of your lane, and answer direct communications, phone calls and pages as they come up. Notifications will happen at random intervals, with approximately one notification per minute. When you respond to a notification, you will be asked a mathematical question.

You will have only 5 seconds to respond to math questions, after that, the opportunity is missed. That means for direct communications, you are required to respond almost right away. The phone-type notification will ring up to 10 times, which means you have approximately 10 seconds to press the button (which is followed by a mathematical question and 5 seconds to respond). The pager-type notification will beep up to 20 times, which means you have approximately 20 seconds to press the button (which is followed by a mathematical question and 5 seconds to respond).

As mentioned above, a minimum of 10$ is paid for your time in the experiment. The following bullet points outline rules for additions and deductions in the study payment.

Rules:

i. $1.00 is deducted per car crash (caused by going off-road or colliding with another vehicle).

ii. $0.10 is deducted for driving outside a 10 MPH window of 55 MPH for more than 15[6] consecutive seconds. (This means that you will have to drive between 45 and 65 MPH. You will have to pass cars that are driving below 45 MPH.)

iii. $0.10 is deducted for every missed notification (including direct, phone answer within 10 rings, and page-back within 20 beeps)

iv. $0.20 is paid for every correct mathematical question answered within 5 seconds.

Note that there will always be a $10.00 base, and the payment cannot fall below that level. In other words, you can make 'extra' money by answering mathematical questions correctly, and any deductions are taken from that 'extra' amount. For example: if you answer three mathematical questions correctly, then you have a running total of $10.60; if you crash after that, you have $10.00.

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[6] During a number of car passing tasks, there will be a car approaching in the oncoming lane; this forces the participant to follow the leading car and wait for a clear oncoming lane, in order to pass. 15 seconds corresponds approximately to the maximum number of seconds the participant may be forced to wait for the oncoming lane to be clear.

Appendix G: Exit Questionnaire

What general strategies did you use to manage driving safely while answering pages, calls and verbal questions?

____

____

____

____

____

____

Did you consider the pages, calls and verbal messages of equal importance to answer?

____

____

____

Please rate your agreement with the following statements:

I preferred receiving messages directly, as opposed to pager or phone.

☐	☐	☐	☐	☐
1	2	3	4	5
Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

I preferred receiving messages by pager, as opposed to directly or by phone.

☐	☐	☐	☐	☐
1	2	3	4	5
Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

I preferred receiving messages by phone, as opposed to directly or by pager.

☐	☐	☐	☐	☐
1	2	3	4	5
Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

For each pair, circle which notification type that you *preferred* to receive:

pager/phone

pager/face-to-face

phone/face-to-face

For each pair, circle which notification type that you found *most difficult* to receive:

pager/phone

pager/face-to-face

phone/face-to-face

For each pair, circle which notification type that you were *more skilled* at receiving:

pager/phone

pager/face-to-face

phone/face-to-face

Appendix H: Consent Form (Consent form will be on University of Toronto Letterhead and in Font Size 12)

TITLE:	Individual differences and immediate versus negotiated notification for medical residents in a driving task
INVESTIGATOR:	Danielle Lottridge (416-946-3995), MASc Candidate Mechanical and Industrial Engineering, University of Toronto

You are being asked to take part in a research study. In order to take part in this study, you must be: 1) Over 18 years old, 2) have a minimum G2 driver's license, and 3) have corrected-to-normal vision.

Before agreeing to participate in this study, it is important that you read and understand the following explanation of the proposed study procedures. The following information describes the purpose, procedures, benefits, discomforts, risks and precautions associated with this study. It also describes your right to refuse to participate or withdraw from the study at any time. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is known as the informed consent process. Please ask the study assistant to explain any words you don't understand before signing this consent form. Make sure all your questions have been answered to your satisfaction before signing this document.

Background

The task of answering a pager beep, a phone call or face-to-face communication may cause different impacts on a secondary-task, such as driving a car. Notification can be classified along a continuum of synchronicity: pagers are negotiated-style or asynchronous, while face-to-face conversations are immediate style, or synchronous.[7] The negotiated style interruption allows more flexibility in choosing when to devote attention. The immediate style interruption is presented instantly. For example, a driver could answer the pager after passing a busy intersection, whereas if a car passenger vocalized a statement, it would be more difficult to delay changing the focus of attention.

Individual differences are associated with how interruptions are cognitively processed. For example, Type Bs are described as being more cognitively relaxed; they have been shown to be more easily interrupted than Type As due to perception of work overload.[8] Type As demonstrate a higher need for control.[9] Individual differences in cognitive style may also be able to predict preferences and behaviour regarding interruptions. Those

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[7] McFarlane DC. Comparison of four primary methods for coordinating the interruption of people in human-computer interaction. HCI. 2002; 17(1):63-139.

[8] Kirmeyer S. Coping with Competing Demands: Interruption and the Type A Pattern. J of Applied Psych. 1988; 73(4):621-629.

[9] Anderson JR. An investigation of Type A behaviour, need to control, perception of loss of control, and severity of coronary artery disease. 1988; Ph.D. 174p.

with a field independent cognitive style are more task-oriented and less dominated by environmental cues. In a search task, field independents took less time and used fewer steps than field dependents[10]. In summary, control and cognitive style have the potential to personalize how individuals are notified of their incoming messages.

Purpose
This study is designed to investigate how different notification types impact driving performance. This information will help in understanding how different notification policies can be tailored to individuals.

Procedures
The study will involve answering questionnaires and completing a brief test on cognitive style. After that, you will practice driving a simulator and answering pages, cell phone calls, and face-to-face interruptions. The communications will consist of answering mathematical equations. At the close of the study, we will ask you about your experiences driving the simulator and dealing with the notifications. It is optional to allow us to videotape the study.

Risks
There is minimal risk involved in this study. The situations presented in the driving simulator will be similar to situations that you experience in playing video games, or your daily driving.

Benefits
You may or may not receive any benefit from your participation in this study. Information learned from this study may benefit notification policies in the future. You will be compensated a minimum of $10, with opportunity to earn up to $6 more.

Confidentiality
All information obtained during the study will be held in strict confidence. You will be identified with a study number only. No names or identifying information will be used in any publication or presentations. No information identifying you will be transferred outside the investigators in this study. Statistical summaries of the results may be published.

Participation
Your participation in this study is voluntary. Your can choose not to participate or you may withdraw at any time.

Questions
If you have any questions about the study, please call the investigator in charge of this study, Danielle Lottridge at (416) 946-3995, or her supervisor, Professor Mark Chignell at (416) 978-8571.

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[10] Palmquist R, Kim KS. Cognitive Style and On-Line Database Search Experience as Predictors of Web Search Performance. Arl 2000; 51(6):558-566.

Consent
I have had the opportunity to discuss this study and my questions have been answered to my satisfaction. I consent to take part in the study with the understanding I may withdraw at any time. I have received a signed copy of this consent form. I voluntarily consent to participate in this study.

Participant's Name (Please Print)	Participant's Signature	Date

I confirm that I have explained the nature and purpose of the study to the subject named above. I have answered all questions.

Name of Person Obtaining Consent	Signature	Date

Appendix I: Interruption Program

Overview
A java program will be built to initiate three kinds of interruptions: direct, cell phone-type ringing, and pager-like beeping. It will take in a button press as input that the user is ready to receive the message (for the ringing and beeping cases). And it will verbalize a random mathematical question. The program will be run for 30 minutes. The program will commence with a button-press.

Demo
There will be a 'Demo' mode for the program. In 'Demo' mode, the program will only run for two minutes. This mode is necessary in order for the participant to become familiar with notification sounds and press the button to acknowledge the notification. The Demo program will output notifications in a set order at set time intervals. The face-to-face and phone-ringing notification will be 20 seconds apart, and the pager-beeps will be 30 seconds apart.
At time 0 and time 20, a face-to-face notification will be issued. At time 40 and 60, a simulated-phone notification will be issued. At time 80 and 110, (30 seconds apart) a pager-type notification will be issued. As in the regular program mode, the participant will press a button to show receipt of the notification and indicate their readiness for a mathematical question. Mathematical questions will follow each notification type.

Notifications
For direct communications, there is no button-press to signal readiness, the participant is required to listen right away to a mathematical question. (In fact, the direct communication consists only of the audio mathematical question!) The phone-type notification will ring up to 10 times, which means the participant has approximately 10 seconds to press the button (which is followed by a mathematical question)*. The pager-type notification will beep up to 20 times, which means the participant has approximately 20 seconds to press the button (which is followed by a mathematical question).*
*The ring and beep should be similar in tone and length: each lasting approximately 1 second.

Notification timing
One notification will happen every minute (with equal probability of being initiated at any second during the first thirty seconds of a minute). Thus, no notifications can happen during the last 30 seconds of each minute. The 30-second pause insures that the participant will have the full amount of response time to answer a pager-beep if one happens to initiate on the 30th second of the minute (ie. 20 seconds to respond to the pager, a few second to hear the mathematical question, and 5 seconds to answer the mathematical question). Since there will be one notification per minute, there will be a total of 30 interruptions (10 of each type) per session that will be administered in a random order.

Notification receipt

As mentioned above, the program will accept an input that the user received the message (from a button-press) for the phone and pager notifications. Following the button-press, the program will verbalize a random mathematical question.

Mathematical question

A random mathematical question will be generated once every minute. The question will be of the form "73 minus 22" or "66 plus 28". The terms should each be double digits (ie between 11 and 99), and the sign should be randomly chosen: a '+' or '-'. To ensure that it is not too difficult, if the question is an addition, the sum should not add to more than 100, and if it is a subtraction, the answer should not be below zero. To ensure adequate difficulty, the terms should not be the same, or multiples of 10 apart.

Program Additions

A related study will also make use of this interruption program. For the purposes of the related study, only the cell-phone type notification will be used. Following receipt of the phone-type notification (with a button press), the program will issue a string of mathematical questions (the exact number should be able to be set by the researcher). The button should remain active (ie. able to accept a button-press) during the mathematical questions. If the participant presses the button, this action will result in an n-second pause being inserted into the string. For example, if the math questions to be vocalized are "2+3 2+4 5+3 2+7 1+3" and the participant pressed the button after the '5' was vocalized, the event-series/vocalization would be "2 plus 3 2 plus 4 5 <button-press><n second pause> plus 3 2 plus 7 1 plus 3".

Appendix J: Driving Data Output

Legend for the first 14 columns:

1 - time (in secs)

2 - longitudinal acceleration (feet/second_squared)

3 - lateral acceleration (feet/second_squared)

4 - longitudinal velocity (feet/second)

5 - lateral velocity (feet/second)

6 - distance traveled (feet)

7 - lateral lane position from centre (feet)

8 - vehicle curvature (1/foot)

9 - roadway curvature (1/foot)

10 - subject's headway angle error (degrees or radians - unclear in manual)

11 - steering wheel angle input (degrees)

12 - longitudinal acceleration due to throttle (feet/second_squared)

13 - longitudinal acceleration due to brake (feet/second_squared)

14 - traffic signal (0 for none)

Legend for set of 4 columns representing onscreen vehicle:

1 - ID number

2 - difference in longitudinal speed between subject and roadway vehicle (feet/second)

3 - longitudinal position of the roadway vehicle w/ respect to subject's vehicle (feet)

4 - lateral position of the roadway vehicle w/ respect to subject's vehicle (feet)

Appendix K: Coding of Interruption Data within Driving Data

The interruption type is represented in the first added column (1 = direct, 2 = ring, 3 = tone); the notification stage is represented in the second added column (1 = ringing/beeping, 2 = math question being pronounced, 3 = response time, 4 = recovery time (2:00 seconds in length)); the accuracy of the mathematical response is represented in the third added column (1 = correct answer, 2 = incorrect, 3 = did not answer). The accuracy is first input at stage '4' of the interruption because it is during stage 3 that they are thinking of the answer. The accuracy indicator continues all the way until stage 4 of the subsequent interruption because the user may be ruminating on the accuracy of their last answer. If the participant did not answer following the vocalized math question output, the ‘3’ indicator starts after stage 2 in the previous column.

Table K1 represents an example of the coding for the following notification: type = direct, start time = 20, response time = 0, math question = 18 + 81, time to output math question =2.994, time to respond to the math question =3.85. Since the participant passed the 22425 point at second 361 (plus one second for human error in starting the interruption program) 20 seconds after that point is 382. The driving simulator was setup to output performance data every 0.5 seconds, but this was not done to the precise millisecond. The interruption program data was incorporated looking at the nearest second data point.

Table K1. Example of coding for one interruption

Time (s)	Interruption Type	Interruption Stage	Math Accuracy	longitudinal acceleration (ft/s^2)	lateral acceleration (ft/s^2)	More columns to the right ...
380.21				-4.13	0.78	
380.73				-4.09	0.03	
381.25				-4.05	1.21	
381.78				-4.01	2.43	
382.33	1	2		4.48	7.51	
382.83	1	2		4.66	8.07	
383.34	1	2		4.85	7.07	
383.85	1	2		5.05	6.68	
384.38	1	2		5.25	9.29	
384.93	1	2		5.45	13.31	
385.48	1	3		5.64	17.93	
386.03	1	3		5.04	16.86	
386.57	1	3		-19.3	-1.44	
387.09	1	3		-16.88	-2.44	
387.60	1	3		-4.06	-2.01	
388.14	1	3		4.71	0.63	
388.66	1	3		4.92	0.75	
389.17	1	3		0.96	4.11	
389.68	1	4	1	-2.68	5.06	
390.19	1	4	1	-2.79	2.33	
390.73	1	4	1	-2.5	-1.05	
391.24	1	4	1	2.35	-1.47	
391.77	0	0	1	4.92	-2.07	
392.35	0	0	1	5.14	-0.1	

Appendix L: Correlations

Correlations: DfC and Op Span

		DfCscore	OpSScore
Pearson Correlation	DfCscore	1.000	.362
	OpSScore	.362	1.000
Sig. (1-tailed)	DfCscore	.	.064
	OpSScore	.064	.
N	DfCscore	19	19
	OpSScore	19	19

Correlations: DfC and GEFT

		DfCscore	GEFTScore
Pearson Correlation	DfCscore	1.000	-.329
	GEFTScore	-.329	1.000
Sig. (1-tailed)	DfCscore	.	.084
	GEFTScore	.084	.
N	DfCscore	19	19
	GEFTScore	19	19

Correlations: DfC and WRA

		DfCscore	cpiWRA
Pearson Correlation	DfCscore	1.000	.440
	cpiWRA	.440	1.000
Sig. (1-tailed)	DfCscore	.	.030
	cpiWRA	.030	.
N	DfCscore	19	19
	cpiWRA	19	19

ANOVA relating DfC to preferences for work related availability

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	248.807	1	248.807	4.074	.060(a)
	Residual	1038.141	17	61.067		
	Total	1286.947	18			

a Predictors: (Constant), cpiWRA
b Dependent Variable: DfCscore

Correlations: Individual differences

		DfCscore	GEFTScore	OpSScore	cpiCMC	cpiVC	cpiWRA

Pearson Correlation	DfCscore	1.000	-.329	.362	-.068	-.050	.440
	GEFTScore	-.329	1.000	.072	.331	-.056	.050
	OpSScore	.362	.072	1.000	.156	-.289	.665
	cpiCMC	-.068	.331	.156	1.000	-.104	.445
	cpiVC	-.050	-.056	-.289	-.104	1.000	-.100
	cpiWRA	.440	.050	.665	.445	-.100	1.000
Sig. (1-tailed)	DfCscore	.	.084	.064	.391	.419	.030
	GEFTScore	.084	.	.385	.083	.409	.419
	OpSScore	.064	.385	.	.261	.115	.001
	cpiCMC	.391	.083	.261	.	.336	.028
	cpiVC	.419	.409	.115	.336	.	.341
	cpiWRA	.030	.419	.001	.028	.341	.
N	DfCscore	19	19	19	19	19	19
	GEFTScore	19	19	19	19	19	19
	OpSScore	19	19	19	19	19	19
	cpiCMC	19	19	19	19	19	19
	cpiVC	19	19	19	19	19	19
	cpiWRA	19	19	19	19	19	19

Correlations for Individual Differences and Interruption type Preferences

Correlations

		GEFTScore	opsscore	dfcscr	LikPrefF2F	LikPrefPag	LikPrefPh
GEFTScore	Pearson Correlation	1	.058	-.346	.195	.010	.055
	Sig. (2-tailed)		.809	.135	.409	.966	.818
	N	20	20	20	20	20	20
opsscore	Pearson Correlation	.058	1	.348	.236	.028	.289
	Sig. (2-tailed)	.809		.132	.317	.907	.216
	N	20	20	20	20	20	20
dfcscr	Pearson Correlation	-.346	.348	1	-.117	.394	-.265
	Sig. (2-tailed)	.135	.132		.625	.086	.259
	N	20	20	20	20	20	20
LikPrefF2F	Pearson Correlation	.195	.236	-.117	1	-.606(**)	-.163
	Sig. (2-tailed)	.409	.317	.625		.005	.492
	N	20	20	20	20	20	20
LikPrefPag	Pearson Correlation	.010	.028	.394	-.606(**)	1	-.125
	Sig. (2-tailed)	.966	.907	.086	.005		.599
	N	20	20	20	20	20	20
LikPrefPh	Pearson Correlation	.055	.289	-.265	-.163	-.125	1
	Sig. (2-tailed)	.818	.216	.259	.492	.599	
	N	20	20	20	20	20	20

** Correlation is significant at the 0.01 level (2-tailed).

Appendix M: Fisher Terms

Discriminant analyses assessing off-call differences attributed to individual differences were performed. Differences in off-call driving behaviour would then allow a comparison of whether interruptions magnify existing differences. Performance variables distinguished between participants based on cognitive style, desire for control, and operation span (see tables 9a, 9b, 9c). Only variables with significant differences are shown.

Table 9a. Significant Variables Distinguishing Field Dependents and Independents

	F	df1	df2	Sig.	FD mean	FI mean
lateral acceleration (ft/s^2)	9.119	1	63270	.003	3.126	3.391
longitudinal velocity (ft/s)	275.957	1	63270	.000	69.847	71.158
lateral position (ft)	313.160	1	63270	.000	4.581	4.291
vehicle curvature (rad)	27.133	1	63270	.000	0.00114	0.00105
road curvature (rad)	30.244	1	63270	.000	0.00087	0.00086
steering angle (°)	19.216	1	63270	.000	19.444	19.785
acceleration due to throttle (ft/s^2)	5.501	1	63270	.019	5.048	4.777
acceleration due to brake (ft/s^2)	15.990	1	63270	.000	2.687	2.344
minimum time to collision (s)	134.020	1	63270	.000	12.615	10.968

Table 9b. Significant Variables Distinguishing High and Low Desire for Control

	F	df1	df2	Sig.	Low DfC mean	High DfC mean
lateral acceleration (ft/s^2)	9.050	1	63270	.003	3.187	3.342
longitudinal velocity (ft/s)	16.423	1	63270	.000	70.020	71.004
lateral position(ft)	29.410	1	63270	.000	4.502	4.291
road curvature (rad)	6.249	1	63270	.012	0.00086	0.00088
steering angle (°)	5.737	1	63270	.017	19.231	19.944
minimum time to collision (s)	32.083	1	63270	.000	10.1470	11.6186

Table 9c. Significant Variables Distinguishing Small and Large Operation Span

	F	df1	df2	Sig.	Small O.S. mean	Large O.S. mean
longitudinal acceleration (ft/s^2)	2.903	1	63270	.088	4.990	5.333
longitudinal velocity (ft/s)	21.900	1	63270	.000	70.807	70.571
acceleration due to throttle (ft/s^2)	4.466	1	63270	.035	4.782	5.014
acceleration due to brake (ft/s^2)	2.970	1	63270	.085	2.353	2.643
minimum time to collision(s)	52.315	1	63270	.000	10.0229	11.8899

(See below for standardized (Fisher) discriminant functions.)

Standardized Canonical Discriminant Function Coefficients for Individual Differences Off Call

GEFT: Standardized Canonical Discriminant Function Coefficients

	Function
	1
Longitudinal	-.427

Acceleration	
Lateral Acceleration	.388
Longitudinal Velocity	-.417
Lateral Position	.644
Road Curvature	-.405
Acceleration due to Throttle	.528
Minimum Time to Collision	.334

DfC: Standardized Canonical Discriminant Function Coefficients

	Function
	1
Longitudinal Velocity	.390
Lateral Position	-.562
Minimum Time to Collision	.776

Operation Span: Standardized Canonical Discriminant Function Coefficients

	Function
	1
Longitudinal Velocity	.510
Lateral Position	.289
Acceleration due to Throttle	.291
Minimum Time to Collision	-.785

Appendix N: Statistical tests

ANOVA relating operation span and cognitive style for negotiated interruptions

Dependent Variable: RESPONSETIME

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter
Corrected Model	108.858(b)	3	36.286	14.021	.000	.097	42.062
Intercept	2349.387	1	2349.387	907.789	.000	.698	907.789
OSPANgrp	16.266	1	16.266	6.285	.013	.016	6.285
GEFTgrp	56.612	1	56.612	21.875	.000	.053	21.875
OSPANgrp * GEFTgrp	36.169	1	36.169	13.975	.000	.034	13.975
Error	1014.509	392	2.588				
Total	3724.458	396					
Corrected Total	1123.367	395					

a Computed using alpha = .05
b R Squared = .097 (Adjusted R Squared = .090)

ANOVA relating operation span and DfC for negotiated interruptions

Dependent Variable: RESPONSETIME

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter
Corrected Model	94.385(b)	3	31.462	11.986	.000	.084	35.957
Intercept	1692.980	1	1692.980	644.956	.000	.622	644.956
OSPANgrp	6.360	1	6.360	2.423	.120	.006	2.423
DfCgrp	26.918	1	26.918	10.255	.001	.025	10.255
OSPANgrp * DfCgrp	45.735	1	45.735	17.423	.000	.043	17.423
Error	1028.982	392	2.625				
Total	3724.458	396					
Corrected Total	1123.367	395					

a Computed using alpha = .05
b R Squared = .084 (Adjusted R Squared = .077)

ANOVA relating operation span and DfC for negotiated interruptions, for field independents

Dependent Variable: RESPONSETIME

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	O P
Corrected Model	64.767(b)	3	21.589	6.799	.000	.087	20.398	
Intercept	1125.761	1	1125.761	354.557	.000	.625	354.557	
NDfC	1.810	1	1.810	.570	.451	.003	.570	
NOpSpan	19.557	1	19.557	6.159	.014	.028	6.159	
NDfC * NOpSpan	16.189	1	16.189	5.099	.025	.023	5.099	
Error	676.301	213	3.175					
Total	2538.558	217						
Corrected Total	741.068	216						

a Computed using alpha = .05
b R Squared = .087 (Adjusted R Squared = .075)

ANOVA relating the type of interruption to the response time to math questions

math_rt

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	33.983	1	33.983	4.558	.033
Within Groups	4227.457	567	7.456		
Total	4261.439	568			

ANOVA relating Operation Span to number of accurate math answers

Acuracy(binary)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.340	1	.340	2.634	.105
Within Groups	76.765	594	.129		
Total	77.106	595			

Correlations relating individual differences number of crashes

Correlations

		collisions	OpSpScore	GEFTscore	DfCscore	total
collisions	Pearson Correlation	1	-.246	-.421	-.045	.906(**)
	Sig. (2-tailed)		.295	.065	.851	.000
	N	20	20	20	20	20
OpSpScore	Pearson Correlation	-.246	1	.070	.301	-.135
	Sig. (2-tailed)	.295		.770	.198	.571
	N	20	20	20	20	20
GEFTscore	Pearson Correlation	-.421	.070	1	-.346	-.370
	Sig. (2-tailed)	.065	.770		.135	.109
	N	20	20	20	20	20
DfCscore	Pearson Correlation	-.045	.301	-.346	1	.017
	Sig. (2-tailed)	.851	.198	.135		.944
	N	20	20	20	20	20
total	Pearson Correlation	.906(**)	-.135	-.370	.017	1
	Sig. (2-tailed)	.000	.571	.109	.944	
	N	20	20	20	20	20

** Correlation is significant at the 0.01 level (2-tailed).

Descriptives for Low risk (high operation span, Field independent) vs. others for total collisions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	9	7.0000	3.80789	1.26930	4.0730	9.9270	2.00	13.00
2.00	11	14.0000	7.91202	2.38556	8.6846	19.3154	1.00	28.00
Total	20	10.8500	7.19850	1.60963	7.4810	14.2190	1.00	28.00

ANOVA for Low risk (high operation span, Field independent) vs. others for total collisions

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	242.550	1	242.550	5.884	.026
Within Groups	742.000	18	41.222		
Total	984.550	19			

Discriminant Analysis for interruption response time, accuracy and math rt

Tests of Equality of Group Means, Desire for Control

	Wilks' Lambda	F	df1	df2	Sig.
RESPONSETIME	.966	14.011	1	394	.000

	Wilks' Lambda	F	df1	df2	Sig.
Acuracy(binary)	.994	3.451	1	567	.064
math_rt	.979	12.080	1	567	.001

Tests of Equality of Group Means, GEFT

	Wilks' Lambda	F	df1	df2	Sig.
RESPONSETIME	.958	17.469	1	394	.000

	Wilks' Lambda	F	df1	df2	Sig.
Acuracy(binary)	.999	.370	1	567	.543
math_rt	.991	5.300	1	567	.022

Tests of Equality of Group Means, Operation Span

	Wilks' Lambda	F	df1	df2	Sig.
RESPONSETIME	.975	10.091	1	394	.002

	Wilks' Lambda	F	df1	df2	Sig.
Acuracy(binary)	.998	1.097	1	567	.295
math_rt	.993	3.889	1	567	.049

Repeated Measures On versus Off Call

Univariate Tests

Source	Measure		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power(a)
on_off	lon_acc	Sphericity Assumed	.082	1	.082	.688	.422	.050	.688	.120
		Greenhouse-Geisser	.082	1.000	.082	.688	.422	.050	.688	.120
		Huynh-Feldt	.082	1.000	.082	.688	.422	.050	.688	.120
		Lower-bound	.082	1.000	.082	.688	.422	.050	.688	.120
	lat_acc	Sphericity Assumed	.171	1	.171	.996	.337	.071	.996	.152
		Greenhouse-Geisser	.171	1.000	.171	.996	.337	.071	.996	.152
		Huynh-Feldt	.171	1.000	.171	.996	.337	.071	.996	.152
		Lower-bound	.171	1.000	.171	.996	.337	.071	.996	.152
	lon_vel	Sphericity Assumed	16.569	1	16.569	4.707	.049	.266	4.707	.519
		Greenhouse-Geisser	16.569	1.000	16.569	4.707	.049	.266	4.707	.519
		Huynh-Feldt	16.569	1.000	16.569	4.707	.049	.266	4.707	.519
		Lower-bound	16.569	1.000	16.569	4.707	.049	.266	4.707	.519
	lat_vel	Sphericity Assumed	.000	1	.000	.028	.870	.002	.028	.053
		Greenhouse-Geisser	.000	1.000	.000	.028	.870	.002	.028	.053
		Huynh-Feldt	.000	1.000	.000	.028	.870	.002	.028	.053
		Lower-bound	.000	1.000	.000	.028	.870	.002	.028	.053
	lat_pos	Sphericity Assumed	.335	1	.335	8.512	.012	.396	8.512	.769
		Greenhouse-Geisser	.335	1.000	.335	8.512	.012	.396	8.512	.769
		Huynh-Feldt	.335	1.000	.335	8.512	.012	.396	8.512	.769

	Lower-bound	.335	1.000	.335	8.512	.012	.396	8.512	.769
veh_curv	Sphericity Assumed	4.675E-10	1	4.675E-10	.013	.909	.001	.013	.051
	Greenhouse-Geisser	4.675E-10	1.000	4.675E-10	.013	.909	.001	.013	.051
	Huynh-Feldt	4.675E-10	1.000	4.675E-10	.013	.909	.001	.013	.051
	Lower-bound	4.675E-10	1.000	4.675E-10	.013	.909	.001	.013	.051
road_cur	Sphericity Assumed	1.807E-08	1	1.807E-08	1.001	.335	.071	1.001	.153
	Greenhouse-Geisser	1.807E-08	1.000	1.807E-08	1.001	.335	.071	1.001	.153
	Huynh-Feldt	1.807E-08	1.000	1.807E-08	1.001	.335	.071	1.001	.153
	Lower-bound	1.807E-08	1.000	1.807E-08	1.001	.335	.071	1.001	.153
head_err	Sphericity Assumed	6.695E-07	1	6.695E-07	.228	.641	.017	.228	.073
	Greenhouse-Geisser	6.695E-07	1.000	6.695E-07	.228	.641	.017	.228	.073
	Huynh-Feldt	6.695E-07	1.000	6.695E-07	.228	.641	.017	.228	.073
	Lower-bound	6.695E-07	1.000	6.695E-07	.228	.641	.017	.228	.073
steer_an	Sphericity Assumed	3.855	1	3.855	.747	.403	.054	.747	.126
	Greenhouse-Geisser	3.855	1.000	3.855	.747	.403	.054	.747	.126
	Huynh-Feldt	3.855	1.000	3.855	.747	.403	.054	.747	.126
	Lower-bound	3.855	1.000	3.855	.747	.403	.054	.747	.126
acc_thr	Sphericity Assumed	.008	1	.008	.418	.529	.031	.418	.092
	Greenhouse-Geisser	.008	1.000	.008	.418	.529	.031	.418	.092
	Huynh-Feldt	.008	1.000	.008	.418	.529	.031	.418	.092
	Lower-bound	.008	1.000	.008	.418	.529	.031	.418	.092
acc_brk	Sphericity Assumed	.024	1	.024	.947	.348	.068	.947	.147
	Greenhouse-Geisser	.024	1.000	.024	.947	.348	.068	.947	.147
	Huynh-Feldt	.024	1.000	.024	.947	.348	.068	.947	.147
	Lower-bound	.024	1.000	.024	.947	.348	.068	.947	.147
min_ttc	Sphericity Assumed	24.211	1	24.211	5.925	.030	.313	5.925	.615
	Greenhouse-Geisser	24.211	1.000	24.211	5.925	.030	.313	5.925	.615
	Huynh-Feldt	24.211	1.000	24.211	5.925	.030	.313	5.925	.615
	Lower-bound	24.211	1.000	24.211	5.925	.030	.313	5.925	.615
sdlonacc	Sphericity Assumed	.127	1	.127	.973	.342	.070	.973	.150
	Greenhouse-Geisser	.127	1.000	.127	.973	.342	.070	.973	.150
	Huynh-Feldt	.127	1.000	.127	.973	.342	.070	.973	.150
	Lower-bound	.127	1.000	.127	.973	.342	.070	.973	.150
sdlatacc	Sphericity Assumed	.191	1	.191	1.110	.311	.079	1.110	.165
	Greenhouse-Geisser	.191	1.000	.191	1.110	.311	.079	1.110	.165
	Huynh-Feldt	.191	1.000	.191	1.110	.311	.079	1.110	.165
	Lower-	.191	1.000	.191	1.110	.311	.079	1.110	.165

		bound								
	sdlatpos	Sphericity Assumed	.123	1	.123	2.252	.157	.148	2.252	.285
		Greenhouse -Geisser	.123	1.000	.123	2.252	.157	.148	2.252	.285
		Huynh-Feldt	.123	1.000	.123	2.252	.157	.148	2.252	.285
		Lower-bound	.123	1.000	.123	2.252	.157	.148	2.252	.285
	sdaccthr	Sphericity Assumed	.032	1	.032	2.160	.165	.142	2.160	.275
		Greenhouse -Geisser	.032	1.000	.032	2.160	.165	.142	2.160	.275
		Huynh-Feldt	.032	1.000	.032	2.160	.165	.142	2.160	.275
		Lower-bound	.032	1.000	.032	2.160	.165	.142	2.160	.275
on_off * NDfC	lon_acc	Sphericity Assumed	.158	1	.158	1.323	.271	.092	1.323	.187
		Greenhouse -Geisser	.158	1.000	.158	1.323	.271	.092	1.323	.187
		Huynh-Feldt	.158	1.000	.158	1.323	.271	.092	1.323	.187
		Lower-bound	.158	1.000	.158	1.323	.271	.092	1.323	.187
	lat_acc	Sphericity Assumed	.117	1	.117	.680	.424	.050	.680	.119
		Greenhouse -Geisser	.117	1.000	.117	.680	.424	.050	.680	.119
		Huynh-Feldt	.117	1.000	.117	.680	.424	.050	.680	.119
		Lower-bound	.117	1.000	.117	.680	.424	.050	.680	.119
	lon_vel	Sphericity Assumed	7.669	1	7.669	2.179	.164	.144	2.179	.277
		Greenhouse -Geisser	7.669	1.000	7.669	2.179	.164	.144	2.179	.277
		Huynh-Feldt	7.669	1.000	7.669	2.179	.164	.144	2.179	.277
		Lower-bound	7.669	1.000	7.669	2.179	.164	.144	2.179	.277
	lat_vel	Sphericity Assumed	.007	1	.007	1.096	.314	.078	1.096	.163
		Greenhouse -Geisser	.007	1.000	.007	1.096	.314	.078	1.096	.163
		Huynh-Feldt	.007	1.000	.007	1.096	.314	.078	1.096	.163
		Lower-bound	.007	1.000	.007	1.096	.314	.078	1.096	.163
	lat_pos	Sphericity Assumed	.091	1	.091	2.322	.152	.152	2.322	.292
		Greenhouse -Geisser	.091	1.000	.091	2.322	.152	.152	2.322	.292
		Huynh-Feldt	.091	1.000	.091	2.322	.152	.152	2.322	.292
		Lower-bound	.091	1.000	.091	2.322	.152	.152	2.322	.292
	veh_curv	Sphericity Assumed	6.838E-08	1	6.838E-08	1.971	.184	.132	1.971	.256
		Greenhouse -Geisser	6.838E-08	1.000	6.838E-08	1.971	.184	.132	1.971	.256
		Huynh-Feldt	6.838E-08	1.000	6.838E-08	1.971	.184	.132	1.971	.256
		Lower-bound	6.838E-08	1.000	6.838E-08	1.971	.184	.132	1.971	.256
	road_cur	Sphericity Assumed	7.560E-08	1	7.560E-08	4.188	.061	.244	4.188	.474
		Greenhouse -Geisser	7.560E-08	1.000	7.560E-08	4.188	.061	.244	4.188	.474
		Huynh-Feldt	7.560E-08	1.000	7.560E-08	4.188	.061	.244	4.188	.474
		Lower-bound	7.560E-08	1.000	7.560E-08	4.188	.061	.244	4.188	.474

	head_err	Sphericity Assumed	5.512E -07	1	5.512E-07	.188	.672	.014	.188	.069
		Greenhouse -Geisser	5.512E -07	1.000	5.512E-07	.188	.672	.014	.188	.069
		Huynh-Feldt	5.512E -07	1.000	5.512E-07	.188	.672	.014	.188	.069
		Lower-bound	5.512E -07	1.000	5.512E-07	.188	.672	.014	.188	.069
	steer_an	Sphericity Assumed	13.361	1	13.361	2.590	.132	.166	2.590	.320
		Greenhouse -Geisser	13.361	1.000	13.361	2.590	.132	.166	2.590	.320
		Huynh-Feldt	13.361	1.000	13.361	2.590	.132	.166	2.590	.320
		Lower-bound	13.361	1.000	13.361	2.590	.132	.166	2.590	.320
	acc_thr	Sphericity Assumed	.003	1	.003	.180	.678	.014	.180	.068
		Greenhouse -Geisser	.003	1.000	.003	.180	.678	.014	.180	.068
		Huynh-Feldt	.003	1.000	.003	.180	.678	.014	.180	.068
		Lower-bound	.003	1.000	.003	.180	.678	.014	.180	.068
	acc_brk	Sphericity Assumed	.031	1	.031	1.231	.287	.086	1.231	.177
		Greenhouse -Geisser	.031	1.000	.031	1.231	.287	.086	1.231	.177
		Huynh-Feldt	.031	1.000	.031	1.231	.287	.086	1.231	.177
		Lower-bound	.031	1.000	.031	1.231	.287	.086	1.231	.177
	min_ttc	Sphericity Assumed	3.455	1	3.455	.846	.375	.061	.846	.137
		Greenhouse -Geisser	3.455	1.000	3.455	.846	.375	.061	.846	.137
		Huynh-Feldt	3.455	1.000	3.455	.846	.375	.061	.846	.137
		Lower-bound	3.455	1.000	3.455	.846	.375	.061	.846	.137
	sdlonacc	Sphericity Assumed	.193	1	.193	1.485	.245	.103	1.485	.204
		Greenhouse -Geisser	.193	1.000	.193	1.485	.245	.103	1.485	.204
		Huynh-Feldt	.193	1.000	.193	1.485	.245	.103	1.485	.204
		Lower-bound	.193	1.000	.193	1.485	.245	.103	1.485	.204
	sdlatacc	Sphericity Assumed	.131	1	.131	.760	.399	.055	.760	.128
		Greenhouse -Geisser	.131	1.000	.131	.760	.399	.055	.760	.128
		Huynh-Feldt	.131	1.000	.131	.760	.399	.055	.760	.128
		Lower-bound	.131	1.000	.131	.760	.399	.055	.760	.128
	sdlatpos	Sphericity Assumed	.023	1	.023	.415	.531	.031	.415	.092
		Greenhouse -Geisser	.023	1.000	.023	.415	.531	.031	.415	.092
		Huynh-Feldt	.023	1.000	.023	.415	.531	.031	.415	.092
		Lower-bound	.023	1.000	.023	.415	.531	.031	.415	.092
	sdaccthr	Sphericity Assumed	.090	1	.090	6.114	.028	.320	6.114	.628
		Greenhouse -Geisser	.090	1.000	.090	6.114	.028	.320	6.114	.628
		Huynh-Feldt	.090	1.000	.090	6.114	.028	.320	6.114	.628
		Lower-bound	.090	1.000	.090	6.114	.028	.320	6.114	.628
on_off * NGEFT	lon_acc	Sphericity Assumed	.038	1	.038	.320	.581	.024	.320	.082

	Greenhouse-Geisser	.038	1.000	.038	.320	.581	.024	.320	.082
	Huynh-Feldt	.038	1.000	.038	.320	.581	.024	.320	.082
	Lower-bound	.038	1.000	.038	.320	.581	.024	.320	.082
lat_acc	Sphericity Assumed	.002	1	.002	.014	.908	.001	.014	.051
	Greenhouse-Geisser	.002	1.000	.002	.014	.908	.001	.014	.051
	Huynh-Feldt	.002	1.000	.002	.014	.908	.001	.014	.051
	Lower-bound	.002	1.000	.002	.014	.908	.001	.014	.051
lon_vel	Sphericity Assumed	2.660	1	2.660	.756	.400	.055	.756	.127
	Greenhouse-Geisser	2.660	1.000	2.660	.756	.400	.055	.756	.127
	Huynh-Feldt	2.660	1.000	2.660	.756	.400	.055	.756	.127
	Lower-bound	2.660	1.000	2.660	.756	.400	.055	.756	.127
lat_vel	Sphericity Assumed	.001	1	.001	.161	.694	.012	.161	.066
	Greenhouse-Geisser	.001	1.000	.001	.161	.694	.012	.161	.066
	Huynh-Feldt	.001	1.000	.001	.161	.694	.012	.161	.066
	Lower-bound	.001	1.000	.001	.161	.694	.012	.161	.066
lat_pos	Sphericity Assumed	.055	1	.055	1.408	.257	.098	1.408	.196
	Greenhouse-Geisser	.055	1.000	.055	1.408	.257	.098	1.408	.196
	Huynh-Feldt	.055	1.000	.055	1.408	.257	.098	1.408	.196
	Lower-bound	.055	1.000	.055	1.408	.257	.098	1.408	.196
veh_curv	Sphericity Assumed	4.530E-08	1	4.530E-08	1.306	.274	.091	1.306	.185
	Greenhouse-Geisser	4.530E-08	1.000	4.530E-08	1.306	.274	.091	1.306	.185
	Huynh-Feldt	4.530E-08	1.000	4.530E-08	1.306	.274	.091	1.306	.185
	Lower-bound	4.530E-08	1.000	4.530E-08	1.306	.274	.091	1.306	.185
road_cur	Sphericity Assumed	1.152E-08	1	1.152E-08	.638	.439	.047	.638	.115
	Greenhouse-Geisser	1.152E-08	1.000	1.152E-08	.638	.439	.047	.638	.115
	Huynh-Feldt	1.152E-08	1.000	1.152E-08	.638	.439	.047	.638	.115
	Lower-bound	1.152E-08	1.000	1.152E-08	.638	.439	.047	.638	.115
head_err	Sphericity Assumed	3.093E-07	1	3.093E-07	.105	.751	.008	.105	.060
	Greenhouse-Geisser	3.093E-07	1.000	3.093E-07	.105	.751	.008	.105	.060
	Huynh-Feldt	3.093E-07	1.000	3.093E-07	.105	.751	.008	.105	.060
	Lower-bound	3.093E-07	1.000	3.093E-07	.105	.751	.008	.105	.060
steer_an	Sphericity Assumed	1.144	1	1.144	.222	.646	.017	.222	.072
	Greenhouse-Geisser	1.144	1.000	1.144	.222	.646	.017	.222	.072
	Huynh-Feldt	1.144	1.000	1.144	.222	.646	.017	.222	.072
	Lower-bound	1.144	1.000	1.144	.222	.646	.017	.222	.072
acc_thr	Sphericity Assumed	.009	1	.009	.514	.486	.038	.514	.102
	Greenhouse	.009	1.000	.009	.514	.486	.038	.514	.102

		-Geisser								
		Huynh-Feldt	.009	1.000	.009	.514	.486	.038	.514	.102
		Lower-bound	.009	1.000	.009	.514	.486	.038	.514	.102
	acc_brk	Sphericity Assumed	.020	1	.020	.804	.386	.058	.804	.132
		Greenhouse-Geisser	.020	1.000	.020	.804	.386	.058	.804	.132
		Huynh-Feldt	.020	1.000	.020	.804	.386	.058	.804	.132
		Lower-bound	.020	1.000	.020	.804	.386	.058	.804	.132
	min_ttc	Sphericity Assumed	.017	1	.017	.004	.950	.000	.004	.050
		Greenhouse-Geisser	.017	1.000	.017	.004	.950	.000	.004	.050
		Huynh-Feldt	.017	1.000	.017	.004	.950	.000	.004	.050
		Lower-bound	.017	1.000	.017	.004	.950	.000	.004	.050
	sdlonacc	Sphericity Assumed	.042	1	.042	.322	.580	.024	.322	.082
		Greenhouse-Geisser	.042	1.000	.042	.322	.580	.024	.322	.082
		Huynh-Feldt	.042	1.000	.042	.322	.580	.024	.322	.082
		Lower-bound	.042	1.000	.042	.322	.580	.024	.322	.082
	sdlatacc	Sphericity Assumed	.001	1	.001	.004	.951	.000	.004	.050
		Greenhouse-Geisser	.001	1.000	.001	.004	.951	.000	.004	.050
		Huynh-Feldt	.001	1.000	.001	.004	.951	.000	.004	.050
		Lower-bound	.001	1.000	.001	.004	.951	.000	.004	.050
	sdlatpos	Sphericity Assumed	.001	1	.001	.011	.919	.001	.011	.051
		Greenhouse-Geisser	.001	1.000	.001	.011	.919	.001	.011	.051
		Huynh-Feldt	.001	1.000	.001	.011	.919	.001	.011	.051
		Lower-bound	.001	1.000	.001	.011	.919	.001	.011	.051
	sdaccthr	Sphericity Assumed	.006	1	.006	.388	.544	.029	.388	.089
		Greenhouse-Geisser	.006	1.000	.006	.388	.544	.029	.388	.089
		Huynh-Feldt	.006	1.000	.006	.388	.544	.029	.388	.089
		Lower-bound	.006	1.000	.006	.388	.544	.029	.388	.089
on_off * NOpSpan	lon_acc	Sphericity Assumed	.000	1	.000	.000	1.000	.000	.000	.050
		Greenhouse-Geisser	.000	1.000	.000	.000	1.000	.000	.000	.050
		Huynh-Feldt	.000	1.000	.000	.000	1.000	.000	.000	.050
		Lower-bound	.000	1.000	.000	.000	1.000	.000	.000	.050
	lat_acc	Sphericity Assumed	.201	1	.201	1.170	.299	.083	1.170	.171
		Greenhouse-Geisser	.201	1.000	.201	1.170	.299	.083	1.170	.171
		Huynh-Feldt	.201	1.000	.201	1.170	.299	.083	1.170	.171
		Lower-bound	.201	1.000	.201	1.170	.299	.083	1.170	.171
	lon_vel	Sphericity Assumed	9.489	1	9.489	2.696	.125	.172	2.696	.331
		Greenhouse-Geisser	9.489	1.000	9.489	2.696	.125	.172	2.696	.331
		Huynh-Feldt	9.489	1.000	9.489	2.696	.125	.172	2.696	.331

	Lower-bound	9.489	1.000	9.489	2.696	.125	.172	2.696	.331
lat_vel	Sphericity Assumed	.007	1	.007	1.037	.327	.074	1.037	.157
	Greenhouse-Geisser	.007	1.000	.007	1.037	.327	.074	1.037	.157
	Huynh-Feldt	.007	1.000	.007	1.037	.327	.074	1.037	.157
	Lower-bound	.007	1.000	.007	1.037	.327	.074	1.037	.157
lat_pos	Sphericity Assumed	.032	1	.032	.819	.382	.059	.819	.134
	Greenhouse-Geisser	.032	1.000	.032	.819	.382	.059	.819	.134
	Huynh-Feldt	.032	1.000	.032	.819	.382	.059	.819	.134
	Lower-bound	.032	1.000	.032	.819	.382	.059	.819	.134
veh_curv	Sphericity Assumed	1.356E-07	1	1.356E-07	3.907	.070	.231	3.907	.449
	Greenhouse-Geisser	1.356E-07	1.000	1.356E-07	3.907	.070	.231	3.907	.449
	Huynh-Feldt	1.356E-07	1.000	1.356E-07	3.907	.070	.231	3.907	.449
	Lower-bound	1.356E-07	1.000	1.356E-07	3.907	.070	.231	3.907	.449
road_cur	Sphericity Assumed	8.362E-08	1	8.362E-08	4.632	.051	.263	4.632	.513
	Greenhouse-Geisser	8.362E-08	1.000	8.362E-08	4.632	.051	.263	4.632	.513
	Huynh-Feldt	8.362E-08	1.000	8.362E-08	4.632	.051	.263	4.632	.513
	Lower-bound	8.362E-08	1.000	8.362E-08	4.632	.051	.263	4.632	.513
head_err	Sphericity Assumed	2.920E-08	1	2.920E-08	.010	.922	.001	.010	.051
	Greenhouse-Geisser	2.920E-08	1.000	2.920E-08	.010	.922	.001	.010	.051
	Huynh-Feldt	2.920E-08	1.000	2.920E-08	.010	.922	.001	.010	.051
	Lower-bound	2.920E-08	1.000	2.920E-08	.010	.922	.001	.010	.051
steer_an	Sphericity Assumed	17.661	1	17.661	3.423	.087	.208	3.423	.403
	Greenhouse-Geisser	17.661	1.000	17.661	3.423	.087	.208	3.423	.403
	Huynh-Feldt	17.661	1.000	17.661	3.423	.087	.208	3.423	.403
	Lower-bound	17.661	1.000	17.661	3.423	.087	.208	3.423	.403
acc_thr	Sphericity Assumed	.006	1	.006	.308	.588	.023	.308	.081
	Greenhouse-Geisser	.006	1.000	.006	.308	.588	.023	.308	.081
	Huynh-Feldt	.006	1.000	.006	.308	.588	.023	.308	.081
	Lower-bound	.006	1.000	.006	.308	.588	.023	.308	.081
acc_brk	Sphericity Assumed	.003	1	.003	.107	.748	.008	.107	.061
	Greenhouse-Geisser	.003	1.000	.003	.107	.748	.008	.107	.061
	Huynh-Feldt	.003	1.000	.003	.107	.748	.008	.107	.061
	Lower-bound	.003	1.000	.003	.107	.748	.008	.107	.061
min_ttc	Sphericity Assumed	7.048	1	7.048	1.725	.212	.117	1.725	.230
	Greenhouse-Geisser	7.048	1.000	7.048	1.725	.212	.117	1.725	.230
	Huynh-Feldt	7.048	1.000	7.048	1.725	.212	.117	1.725	.230
	Lower-	7.048	1.000	7.048	1.725	.212	.117	1.725	.230

		bound								
	sdlonacc	Sphericity Assumed	.001	1	.001	.008	.928	.001	.008	.051
		Greenhouse -Geisser	.001	1.000	.001	.008	.928	.001	.008	.051
		Huynh-Feldt	.001	1.000	.001	.008	.928	.001	.008	.051
		Lower-bound	.001	1.000	.001	.008	.928	.001	.008	.051
	sdlatacc	Sphericity Assumed	.210	1	.210	1.218	.290	.086	1.218	.176
		Greenhouse -Geisser	.210	1.000	.210	1.218	.290	.086	1.218	.176
		Huynh-Feldt	.210	1.000	.210	1.218	.290	.086	1.218	.176
		Lower-bound	.210	1.000	.210	1.218	.290	.086	1.218	.176
	sdlatpos	Sphericity Assumed	.128	1	.128	2.351	.149	.153	2.351	.295
		Greenhouse -Geisser	.128	1.000	.128	2.351	.149	.153	2.351	.295
		Huynh-Feldt	.128	1.000	.128	2.351	.149	.153	2.351	.295
		Lower-bound	.128	1.000	.128	2.351	.149	.153	2.351	.295
	sdaccthr	Sphericity Assumed	.019	1	.019	1.294	.276	.091	1.294	.184
		Greenhouse -Geisser	.019	1.000	.019	1.294	.276	.091	1.294	.184
		Huynh-Feldt	.019	1.000	.019	1.294	.276	.091	1.294	.184
		Lower-bound	.019	1.000	.019	1.294	.276	.091	1.294	.184
on_off * NDfC * NGEFT	lon_acc	Sphericity Assumed	.045	1	.045	.374	.551	.028	.374	.088
		Greenhouse -Geisser	.045	1.000	.045	.374	.551	.028	.374	.088
		Huynh-Feldt	.045	1.000	.045	.374	.551	.028	.374	.088
		Lower-bound	.045	1.000	.045	.374	.551	.028	.374	.088
	lat_acc	Sphericity Assumed	.025	1	.025	.148	.707	.011	.148	.065
		Greenhouse -Geisser	.025	1.000	.025	.148	.707	.011	.148	.065
		Huynh-Feldt	.025	1.000	.025	.148	.707	.011	.148	.065
		Lower-bound	.025	1.000	.025	.148	.707	.011	.148	.065
	lon_vel	Sphericity Assumed	2.550	1	2.550	.724	.410	.053	.724	.124
		Greenhouse -Geisser	2.550	1.000	2.550	.724	.410	.053	.724	.124
		Huynh-Feldt	2.550	1.000	2.550	.724	.410	.053	.724	.124
		Lower-bound	2.550	1.000	2.550	.724	.410	.053	.724	.124
	lat_vel	Sphericity Assumed	.001	1	.001	.132	.722	.010	.132	.063
		Greenhouse -Geisser	.001	1.000	.001	.132	.722	.010	.132	.063
		Huynh-Feldt	.001	1.000	.001	.132	.722	.010	.132	.063
		Lower-bound	.001	1.000	.001	.132	.722	.010	.132	.063
	lat_pos	Sphericity Assumed	.079	1	.079	1.997	.181	.133	1.997	.258
		Greenhouse -Geisser	.079	1.000	.079	1.997	.181	.133	1.997	.258
		Huynh-Feldt	.079	1.000	.079	1.997	.181	.133	1.997	.258
		Lower-bound	.079	1.000	.079	1.997	.181	.133	1.997	.258

veh_curv	Sphericity Assumed	2.754E-09	1	2.754E-09	.079	.783	.006	.079	.058
	Greenhouse-Geisser	2.754E-09	1.000	2.754E-09	.079	.783	.006	.079	.058
	Huynh-Feldt	2.754E-09	1.000	2.754E-09	.079	.783	.006	.079	.058
	Lower-bound	2.754E-09	1.000	2.754E-09	.079	.783	.006	.079	.058
road_cur	Sphericity Assumed	1.241E-10	1	1.241E-10	.007	.935	.001	.007	.051
	Greenhouse-Geisser	1.241E-10	1.000	1.241E-10	.007	.935	.001	.007	.051
	Huynh-Feldt	1.241E-10	1.000	1.241E-10	.007	.935	.001	.007	.051
	Lower-bound	1.241E-10	1.000	1.241E-10	.007	.935	.001	.007	.051
head_err	Sphericity Assumed	1.844E-07	1	1.844E-07	.063	.806	.005	.063	.056
	Greenhouse-Geisser	1.844E-07	1.000	1.844E-07	.063	.806	.005	.063	.056
	Huynh-Feldt	1.844E-07	1.000	1.844E-07	.063	.806	.005	.063	.056
	Lower-bound	1.844E-07	1.000	1.844E-07	.063	.806	.005	.063	.056
steer_an	Sphericity Assumed	.549	1	.549	.106	.749	.008	.106	.061
	Greenhouse-Geisser	.549	1.000	.549	.106	.749	.008	.106	.061
	Huynh-Feldt	.549	1.000	.549	.106	.749	.008	.106	.061
	Lower-bound	.549	1.000	.549	.106	.749	.008	.106	.061
acc_thr	Sphericity Assumed	.001	1	.001	.079	.783	.006	.079	.058
	Greenhouse-Geisser	.001	1.000	.001	.079	.783	.006	.079	.058
	Huynh-Feldt	.001	1.000	.001	.079	.783	.006	.079	.058
	Lower-bound	.001	1.000	.001	.079	.783	.006	.079	.058
acc_brk	Sphericity Assumed	.026	1	.026	1.042	.326	.074	1.042	.157
	Greenhouse-Geisser	.026	1.000	.026	1.042	.326	.074	1.042	.157
	Huynh-Feldt	.026	1.000	.026	1.042	.326	.074	1.042	.157
	Lower-bound	.026	1.000	.026	1.042	.326	.074	1.042	.157
min_ttc	Sphericity Assumed	8.713	1	8.713	2.132	.168	.141	2.132	.273
	Greenhouse-Geisser	8.713	1.000	8.713	2.132	.168	.141	2.132	.273
	Huynh-Feldt	8.713	1.000	8.713	2.132	.168	.141	2.132	.273
	Lower-bound	8.713	1.000	8.713	2.132	.168	.141	2.132	.273
sdlonacc	Sphericity Assumed	.055	1	.055	.423	.527	.031	.423	.093
	Greenhouse-Geisser	.055	1.000	.055	.423	.527	.031	.423	.093
	Huynh-Feldt	.055	1.000	.055	.423	.527	.031	.423	.093
	Lower-bound	.055	1.000	.055	.423	.527	.031	.423	.093
sdlatacc	Sphericity Assumed	.030	1	.030	.176	.682	.013	.176	.068
	Greenhouse-Geisser	.030	1.000	.030	.176	.682	.013	.176	.068
	Huynh-Feldt	.030	1.000	.030	.176	.682	.013	.176	.068
	Lower-bound	.030	1.000	.030	.176	.682	.013	.176	.068
sdlatpos	Sphericity	.045	1	.045	.827	.380	.060	.827	.135

		Assumed								
		Greenhouse-Geisser	.045	1.000	.045	.827	.380	.060	.827	.135
		Huynh-Feldt	.045	1.000	.045	.827	.380	.060	.827	.135
		Lower-bound	.045	1.000	.045	.827	.380	.060	.827	.135
	sdaccthr	Sphericity Assumed	.009	1	.009	.627	.443	.046	.627	.114
		Greenhouse-Geisser	.009	1.000	.009	.627	.443	.046	.627	.114
		Huynh-Feldt	.009	1.000	.009	.627	.443	.046	.627	.114
		Lower-bound	.009	1.000	.009	.627	.443	.046	.627	.114
on_off * NDfC * NOpSpan	lon_acc	Sphericity Assumed	.009	1	.009	.078	.784	.006	.078	.058
		Greenhouse-Geisser	.009	1.000	.009	.078	.784	.006	.078	.058
		Huynh-Feldt	.009	1.000	.009	.078	.784	.006	.078	.058
		Lower-bound	.009	1.000	.009	.078	.784	.006	.078	.058
	lat_acc	Sphericity Assumed	.819	1	.819	4.770	.048	.268	4.770	.525
		Greenhouse-Geisser	.819	1.000	.819	4.770	.048	.268	4.770	.525
		Huynh-Feldt	.819	1.000	.819	4.770	.048	.268	4.770	.525
		Lower-bound	.819	1.000	.819	4.770	.048	.268	4.770	.525
	lon_vel	Sphericity Assumed	4.891	1	4.891	1.389	.260	.097	1.389	.194
		Greenhouse-Geisser	4.891	1.000	4.891	1.389	.260	.097	1.389	.194
		Huynh-Feldt	4.891	1.000	4.891	1.389	.260	.097	1.389	.194
		Lower-bound	4.891	1.000	4.891	1.389	.260	.097	1.389	.194
	lat_vel	Sphericity Assumed	.016	1	.016	2.442	.142	.158	2.442	.305
		Greenhouse-Geisser	.016	1.000	.016	2.442	.142	.158	2.442	.305
		Huynh-Feldt	.016	1.000	.016	2.442	.142	.158	2.442	.305
		Lower-bound	.016	1.000	.016	2.442	.142	.158	2.442	.305
	lat_pos	Sphericity Assumed	.077	1	.077	1.958	.185	.131	1.958	.254
		Greenhouse-Geisser	.077	1.000	.077	1.958	.185	.131	1.958	.254
		Huynh-Feldt	.077	1.000	.077	1.958	.185	.131	1.958	.254
		Lower-bound	.077	1.000	.077	1.958	.185	.131	1.958	.254
	veh_curv	Sphericity Assumed	1.401E-07	1	1.401E-07	4.037	.066	.237	4.037	.460
		Greenhouse-Geisser	1.401E-07	1.000	1.401E-07	4.037	.066	.237	4.037	.460
		Huynh-Feldt	1.401E-07	1.000	1.401E-07	4.037	.066	.237	4.037	.460
		Lower-bound	1.401E-07	1.000	1.401E-07	4.037	.066	.237	4.037	.460
	road_cur	Sphericity Assumed	5.031E-08	1	5.031E-08	2.786	.119	.177	2.786	.340
		Greenhouse-Geisser	5.031E-08	1.000	5.031E-08	2.786	.119	.177	2.786	.340
		Huynh-Feldt	5.031E-08	1.000	5.031E-08	2.786	.119	.177	2.786	.340
		Lower-bound	5.031E-08	1.000	5.031E-08	2.786	.119	.177	2.786	.340
	head_err	Sphericity	1.246E	1	1.246E-	.425	.526	.032	.425	.093

		Assumed	-06		06					
		Greenhouse -Geisser	1.246E -06	1.000	1.246E-06	.425	.526	.032	.425	.093
		Huynh-Feldt	1.246E -06	1.000	1.246E-06	.425	.526	.032	.425	.093
		Lower-bound	1.246E -06	1.000	1.246E-06	.425	.526	.032	.425	.093
	steer_an	Sphericity Assumed	31.345	1	31.345	6.075	.028	.318	6.075	.626
		Greenhouse -Geisser	31.345	1.000	31.345	6.075	.028	.318	6.075	.626
		Huynh-Feldt	31.345	1.000	31.345	6.075	.028	.318	6.075	.626
		Lower-bound	31.345	1.000	31.345	6.075	.028	.318	6.075	.626
	acc_thr	Sphericity Assumed	.002	1	.002	.099	.758	.008	.099	.060
		Greenhouse -Geisser	.002	1.000	.002	.099	.758	.008	.099	.060
		Huynh-Feldt	.002	1.000	.002	.099	.758	.008	.099	.060
		Lower-bound	.002	1.000	.002	.099	.758	.008	.099	.060
	acc_brk	Sphericity Assumed	.009	1	.009	.351	.564	.026	.351	.085
		Greenhouse -Geisser	.009	1.000	.009	.351	.564	.026	.351	.085
		Huynh-Feldt	.009	1.000	.009	.351	.564	.026	.351	.085
		Lower-bound	.009	1.000	.009	.351	.564	.026	.351	.085
	min_ttc	Sphericity Assumed	13.611	1	13.611	3.331	.091	.204	3.331	.394
		Greenhouse -Geisser	13.611	1.000	13.611	3.331	.091	.204	3.331	.394
		Huynh-Feldt	13.611	1.000	13.611	3.331	.091	.204	3.331	.394
		Lower-bound	13.611	1.000	13.611	3.331	.091	.204	3.331	.394
	sdlonacc	Sphericity Assumed	.009	1	.009	.071	.795	.005	.071	.057
		Greenhouse -Geisser	.009	1.000	.009	.071	.795	.005	.071	.057
		Huynh-Feldt	.009	1.000	.009	.071	.795	.005	.071	.057
		Lower-bound	.009	1.000	.009	.071	.795	.005	.071	.057
	sdlatacc	Sphericity Assumed	.809	1	.809	4.700	.049	.266	4.700	.519
		Greenhouse -Geisser	.809	1.000	.809	4.700	.049	.266	4.700	.519
		Huynh-Feldt	.809	1.000	.809	4.700	.049	.266	4.700	.519
		Lower-bound	.809	1.000	.809	4.700	.049	.266	4.700	.519
	sdlatpos	Sphericity Assumed	.163	1	.163	2.991	.107	.187	2.991	.360
		Greenhouse -Geisser	.163	1.000	.163	2.991	.107	.187	2.991	.360
		Huynh-Feldt	.163	1.000	.163	2.991	.107	.187	2.991	.360
		Lower-bound	.163	1.000	.163	2.991	.107	.187	2.991	.360
	sdaccthr	Sphericity Assumed	.005	1	.005	.361	.559	.027	.361	.086
		Greenhouse -Geisser	.005	1.000	.005	.361	.559	.027	.361	.086
		Huynh-Feldt	.005	1.000	.005	.361	.559	.027	.361	.086
		Lower-bound	.005	1.000	.005	.361	.559	.027	.361	.086
on_off * NGEFT * NOpSpan	lon_acc	Sphericity Assumed	.005	1	.005	.043	.840	.003	.043	.054

	Greenhouse-Geisser	.005	1.000	.005	.043	.840	.003	.043	.054
	Huynh-Feldt	.005	1.000	.005	.043	.840	.003	.043	.054
	Lower-bound	.005	1.000	.005	.043	.840	.003	.043	.054
lat_acc	Sphericity Assumed	.052	1	.052	.305	.590	.023	.305	.081
	Greenhouse-Geisser	.052	1.000	.052	.305	.590	.023	.305	.081
	Huynh-Feldt	.052	1.000	.052	.305	.590	.023	.305	.081
	Lower-bound	.052	1.000	.052	.305	.590	.023	.305	.081
lon_vel	Sphericity Assumed	.172	1	.172	.049	.828	.004	.049	.055
	Greenhouse-Geisser	.172	1.000	.172	.049	.828	.004	.049	.055
	Huynh-Feldt	.172	1.000	.172	.049	.828	.004	.049	.055
	Lower-bound	.172	1.000	.172	.049	.828	.004	.049	.055
lat_vel	Sphericity Assumed	5.218E-05	1	5.218E-05	.008	.930	.001	.008	.051
	Greenhouse-Geisser	5.218E-05	1.000	5.218E-05	.008	.930	.001	.008	.051
	Huynh-Feldt	5.218E-05	1.000	5.218E-05	.008	.930	.001	.008	.051
	Lower-bound	5.218E-05	1.000	5.218E-05	.008	.930	.001	.008	.051
lat_pos	Sphericity Assumed	.028	1	.028	.712	.414	.052	.712	.123
	Greenhouse-Geisser	.028	1.000	.028	.712	.414	.052	.712	.123
	Huynh-Feldt	.028	1.000	.028	.712	.414	.052	.712	.123
	Lower-bound	.028	1.000	.028	.712	.414	.052	.712	.123
veh_curv	Sphericity Assumed	9.839E-09	1	9.839E-09	.284	.603	.021	.284	.078
	Greenhouse-Geisser	9.839E-09	1.000	9.839E-09	.284	.603	.021	.284	.078
	Huynh-Feldt	9.839E-09	1.000	9.839E-09	.284	.603	.021	.284	.078
	Lower-bound	9.839E-09	1.000	9.839E-09	.284	.603	.021	.284	.078
road_cur	Sphericity Assumed	1.328E-08	1	1.328E-08	.735	.407	.054	.735	.125
	Greenhouse-Geisser	1.328E-08	1.000	1.328E-08	.735	.407	.054	.735	.125
	Huynh-Feldt	1.328E-08	1.000	1.328E-08	.735	.407	.054	.735	.125
	Lower-bound	1.328E-08	1.000	1.328E-08	.735	.407	.054	.735	.125
head_err	Sphericity Assumed	4.635E-07	1	4.635E-07	.158	.697	.012	.158	.066
	Greenhouse-Geisser	4.635E-07	1.000	4.635E-07	.158	.697	.012	.158	.066
	Huynh-Feldt	4.635E-07	1.000	4.635E-07	.158	.697	.012	.158	.066
	Lower-bound	4.635E-07	1.000	4.635E-07	.158	.697	.012	.158	.066
steer_an	Sphericity Assumed	2.013	1	2.013	.390	.543	.029	.390	.089
	Greenhouse-Geisser	2.013	1.000	2.013	.390	.543	.029	.390	.089
	Huynh-Feldt	2.013	1.000	2.013	.390	.543	.029	.390	.089
	Lower-bound	2.013	1.000	2.013	.390	.543	.029	.390	.089
acc_thr	Sphericity Assumed	.018	1	.018	.985	.339	.070	.985	.151

		Greenhouse -Geisser	.018	1.000	.018	.985	.339	.070	.985	.151
		Huynh-Feldt	.018	1.000	.018	.985	.339	.070	.985	.151
		Lower-bound	.018	1.000	.018	.985	.339	.070	.985	.151
	acc_brk	Sphericity Assumed	.001	1	.001	.043	.838	.003	.043	.054
		Greenhouse -Geisser	.001	1.000	.001	.043	.838	.003	.043	.054
		Huynh-Feldt	.001	1.000	.001	.043	.838	.003	.043	.054
		Lower-bound	.001	1.000	.001	.043	.838	.003	.043	.054
	min_ttc	Sphericity Assumed	10.078	1	10.078	2.466	.140	.159	2.466	.307
		Greenhouse -Geisser	10.078	1.000	10.078	2.466	.140	.159	2.466	.307
		Huynh-Feldt	10.078	1.000	10.078	2.466	.140	.159	2.466	.307
		Lower-bound	10.078	1.000	10.078	2.466	.140	.159	2.466	.307
	sdlonacc	Sphericity Assumed	.001	1	.001	.010	.921	.001	.010	.051
		Greenhouse -Geisser	.001	1.000	.001	.010	.921	.001	.010	.051
		Huynh-Feldt	.001	1.000	.001	.010	.921	.001	.010	.051
		Lower-bound	.001	1.000	.001	.010	.921	.001	.010	.051
	sdlatacc	Sphericity Assumed	.056	1	.056	.326	.578	.024	.326	.083
		Greenhouse -Geisser	.056	1.000	.056	.326	.578	.024	.326	.083
		Huynh-Feldt	.056	1.000	.056	.326	.578	.024	.326	.083
		Lower-bound	.056	1.000	.056	.326	.578	.024	.326	.083
	sdlatpos	Sphericity Assumed	.034	1	.034	.617	.446	.045	.617	.113
		Greenhouse -Geisser	.034	1.000	.034	.617	.446	.045	.617	.113
		Huynh-Feldt	.034	1.000	.034	.617	.446	.045	.617	.113
		Lower-bound	.034	1.000	.034	.617	.446	.045	.617	.113
	sdaccthr	Sphericity Assumed	.004	1	.004	.284	.603	.021	.284	.079
		Greenhouse -Geisser	.004	1.000	.004	.284	.603	.021	.284	.079
		Huynh-Feldt	.004	1.000	.004	.284	.603	.021	.284	.079
		Lower-bound	.004	1.000	.004	.284	.603	.021	.284	.079
Error(on_off)	lon_acc	Sphericity Assumed	1.553	13	.119					
		Greenhouse -Geisser	1.553	13.000	.119					
		Huynh-Feldt	1.553	13.000	.119					
		Lower-bound	1.553	13.000	.119					
	lat_acc	Sphericity Assumed	2.232	13	.172					
		Greenhouse -Geisser	2.232	13.000	.172					
		Huynh-Feldt	2.232	13.000	.172					
		Lower-bound	2.232	13.000	.172					
	lon_vel	Sphericity Assumed	45.764	13	3.520					
		Greenhouse -Geisser	45.764	13.000	3.520					

	Huynh-Feldt	45.764	13.000	3.520					
	Lower-bound	45.764	13.000	3.520					
lat_vel	Sphericity Assumed	.086	13	.007					
	Greenhouse-Geisser	.086	13.000	.007					
	Huynh-Feldt	.086	13.000	.007					
	Lower-bound	.086	13.000	.007					
lat_pos	Sphericity Assumed	.511	13	.039					
	Greenhouse-Geisser	.511	13.000	.039					
	Huynh-Feldt	.511	13.000	.039					
	Lower-bound	.511	13.000	.039					
veh_curv	Sphericity Assumed	4.511E-07	13	3.470E-08					
	Greenhouse-Geisser	4.511E-07	13.000	3.470E-08					
	Huynh-Feldt	4.511E-07	13.000	3.470E-08					
	Lower-bound	4.511E-07	13.000	3.470E-08					
road_cur	Sphericity Assumed	2.347E-07	13	1.805E-08					
	Greenhouse-Geisser	2.347E-07	13.000	1.805E-08					
	Huynh-Feldt	2.347E-07	13.000	1.805E-08					
	Lower-bound	2.347E-07	13.000	1.805E-08					
head_err	Sphericity Assumed	3.814E-05	13	2.934E-06					
	Greenhouse-Geisser	3.814E-05	13.000	2.934E-06					
	Huynh-Feldt	3.814E-05	13.000	2.934E-06					
	Lower-bound	3.814E-05	13.000	2.934E-06					
steer_an	Sphericity Assumed	67.072	13	5.159					
	Greenhouse-Geisser	67.072	13.000	5.159					
	Huynh-Feldt	67.072	13.000	5.159					
	Lower-bound	67.072	13.000	5.159					
acc_thr	Sphericity Assumed	.236	13	.018					
	Greenhouse-Geisser	.236	13.000	.018					
	Huynh-Feldt	.236	13.000	.018					
	Lower-bound	.236	13.000	.018					
acc_brk	Sphericity Assumed	.325	13	.025					
	Greenhouse-Geisser	.325	13.000	.025					
	Huynh-Feldt	.325	13.000	.025					
	Lower-bound	.325	13.000	.025					
min_ttc	Sphericity Assumed	53.125	13	4.087					
	Greenhouse-Geisser	53.125	13.000	4.087					
	Huynh-Feldt	53.125	13.000	4.087					

		Lower-bound	53.125	13.000	4.087					
	sdlonacc	Sphericity Assumed	1.692	13	.130					
		Greenhouse-Geisser	1.692	13.000	.130					
		Huynh-Feldt	1.692	13.000	.130					
		Lower-bound	1.692	13.000	.130					
	sdlatacc	Sphericity Assumed	2.239	13	.172					
		Greenhouse-Geisser	2.239	13.000	.172					
		Huynh-Feldt	2.239	13.000	.172					
		Lower-bound	2.239	13.000	.172					
	sdlatpos	Sphericity Assumed	.708	13	.054					
		Greenhouse-Geisser	.708	13.000	.054					
		Huynh-Feldt	.708	13.000	.054					
		Lower-bound	.708	13.000	.054					
	sdaccthr	Sphericity Assumed	.192	13	.015					
		Greenhouse-Geisser	.192	13.000	.015					
		Huynh-Feldt	.192	13.000	.015					
		Lower-bound	.192	13.000	.015					

a Computed using alpha = .05

Repeated Measures Type and State – Univariate Tests

Univariate Tests

Source	Measure		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power(a)
type	lon_acc	Sphericity Assumed	2.310	2	1.155	.879	.427	.063	1.757	.185
		Greenhouse-Geisser	2.310	1.852	1.247	.879	.421	.063	1.627	.178
		Huynh-Feldt	2.310	2.000	1.155	.879	.427	.063	1.757	.185
		Lower-bound	2.310	1.000	2.310	.879	.366	.063	.879	.140
	lat_acc	Sphericity Assumed	.354	2	.177	.045	.957	.003	.089	.056
		Greenhouse-Geisser	.354	1.553	.228	.045	.923	.003	.069	.055
		Huynh-Feldt	.354	2.000	.177	.045	.957	.003	.089	.056
		Lower-bound	.354	1.000	.354	.045	.836	.003	.045	.054
	lon_vel	Sphericity Assumed	5.651	2	2.826	.035	.966	.003	.070	.055
		Greenhouse-Geisser	5.651	1.715	3.294	.035	.949	.003	.060	.054
		Huynh-Feldt	5.651	2.000	2.826	.035	.966	.003	.070	.055
		Lower-bound	5.651	1.000	5.651	.035	.855	.003	.035	.053
	lat_vel	Sphericity Assumed	.118	2	.059	.367	.697	.027	.733	.103

	Greenhouse-Geisser	.118	1.640	.072	.367	.656	.027	.601	.097
	Huynh-Feldt	.118	2.000	.059	.367	.697	.027	.733	.103
	Lower-bound	.118	1.000	.118	.367	.555	.027	.367	.087
lat_pos	Sphericity Assumed	.485	2	.242	.622	.545	.046	1.244	.143
	Greenhouse-Geisser	.485	1.957	.248	.622	.541	.046	1.217	.141
	Huynh-Feldt	.485	2.000	.242	.622	.545	.046	1.244	.143
	Lower-bound	.485	1.000	.485	.622	.444	.046	.622	.113
veh_curv	Sphericity Assumed	7.872E-07	2	3.936E-07	.652	.529	.048	1.305	.147
	Greenhouse-Geisser	7.872E-07	1.630	4.829E-07	.652	.501	.048	1.063	.137
	Huynh-Feldt	7.872E-07	2.000	3.936E-07	.652	.529	.048	1.305	.147
	Lower-bound	7.872E-07	1.000	7.872E-07	.652	.434	.048	.652	.116
raod_cur	Sphericity Assumed	3.657E-07	2	1.829E-07	.511	.606	.038	1.023	.125
	Greenhouse-Geisser	3.657E-07	1.496	2.445E-07	.511	.555	.038	.765	.114
	Huynh-Feldt	3.657E-07	2.000	1.829E-07	.511	.606	.038	1.023	.125
	Lower-bound	3.657E-07	1.000	3.657E-07	.511	.487	.038	.511	.102
head_err	Sphericity Assumed	.000	2	6.096E-05	1.113	.344	.079	2.227	.224
	Greenhouse-Geisser	.000	1.565	7.791E-05	1.113	.334	.079	1.742	.200
	Huynh-Feldt	.000	2.000	6.096E-05	1.113	.344	.079	2.227	.224
	Lower-bound	.000	1.000	.000	1.113	.311	.079	1.113	.165
steer_an	Sphericity Assumed	75.533	2	37.766	.269	.766	.020	.539	.088
	Greenhouse-Geisser	75.533	1.538	49.126	.269	.709	.020	.414	.083
	Huynh-Feldt	75.533	2.000	37.766	.269	.766	.020	.539	.088
	Lower-bound	75.533	1.000	75.533	.269	.613	.020	.269	.077
acc_thr	Sphericity Assumed	3.170	2	1.585	3.844	.034	.228	7.688	.645
	Greenhouse-Geisser	3.170	1.944	1.631	3.844	.036	.228	7.471	.635
	Huynh-Feldt	3.170	2.000	1.585	3.844	.034	.228	7.688	.645
	Lower-bound	3.170	1.000	3.170	3.844	.072	.228	3.844	.443
acc_brk	Sphericity Assumed	1.367	2	.683	2.473	.104	.160	4.946	.452
	Greenhouse-Geisser	1.367	1.386	.986	2.473	.125	.160	3.429	.367
	Huynh-Feldt	1.367	2.000	.683	2.473	.104	.160	4.946	.452
	Lower-bound	1.367	1.000	1.367	2.473	.140	.160	2.473	.308
min_ttc	Sphericity Assumed	34.147	2	17.073	.484	.622	.036	.968	.121
	Greenhouse-Geisser	34.147	1.408	24.255	.484	.559	.036	.681	.109
	Huynh-Feldt	34.147	2.000	17.073	.484	.622	.036	.968	.121
	Lower-bound	34.147	1.000	34.147	.484	.499	.036	.484	.099
sdlonacc	Sphericity Assumed	3.254	2	1.627	1.162	.328	.082	2.325	.233
	Greenhouse-Geisser	3.254	1.934	1.682	1.162	.328	.082	2.248	.229

		Huynh-Feldt	3.254	2.000	1.627	1.162	.328	.082	2.325	.233
		Lower-bound	3.254	1.000	3.254	1.162	.301	.082	1.162	.170
	sdlatacc	Sphericity Assumed	.194	2	.097	.025	.975	.002	.051	.053
		Greenhouse-Geisser	.194	1.517	.128	.025	.947	.002	.038	.053
		Huynh-Feldt	.194	2.000	.097	.025	.975	.002	.051	.053
		Lower-bound	.194	1.000	.194	.025	.876	.002	.025	.053
	sdlatpos	Sphericity Assumed	2.232	2	1.116	1.479	.246	.102	2.959	.287
		Greenhouse-Geisser	2.232	1.987	1.124	1.479	.246	.102	2.939	.286
		Huynh-Feldt	2.232	2.000	1.116	1.479	.246	.102	2.959	.287
		Lower-bound	2.232	1.000	2.232	1.479	.245	.102	1.479	.204
	sdaccthr	Sphericity Assumed	.391	2	.195	.964	.395	.069	1.928	.199
		Greenhouse-Geisser	.391	1.995	.196	.964	.394	.069	1.923	.199
		Huynh-Feldt	.391	2.000	.195	.964	.395	.069	1.928	.199
		Lower-bound	.391	1.000	.391	.964	.344	.069	.964	.149
type * NDfC	lon_acc	Sphericity Assumed	3.979	2	1.990	1.513	.239	.104	3.027	.293
		Greenhouse-Geisser	3.979	1.852	2.149	1.513	.240	.104	2.802	.281
		Huynh-Feldt	3.979	2.000	1.990	1.513	.239	.104	3.027	.293
		Lower-bound	3.979	1.000	3.979	1.513	.240	.104	1.513	.207
	lat_acc	Sphericity Assumed	4.315	2	2.158	.543	.588	.040	1.086	.130
		Greenhouse-Geisser	4.315	1.553	2.779	.543	.546	.040	.843	.120
		Huynh-Feldt	4.315	2.000	2.158	.543	.588	.040	1.086	.130
		Lower-bound	4.315	1.000	4.315	.543	.474	.040	.543	.105
	lon_vel	Sphericity Assumed	308.911	2	154.456	1.907	.169	.128	3.813	.359
		Greenhouse-Geisser	308.911	1.715	180.084	1.907	.176	.128	3.271	.330
		Huynh-Feldt	308.911	2.000	154.456	1.907	.169	.128	3.813	.359
		Lower-bound	308.911	1.000	308.911	1.907	.191	.128	1.907	.249
	lat_vel	Sphericity Assumed	.020	2	.010	.061	.941	.005	.123	.058
		Greenhouse-Geisser	.020	1.640	.012	.061	.911	.005	.101	.058
		Huynh-Feldt	.020	2.000	.010	.061	.941	.005	.123	.058
		Lower-bound	.020	1.000	.020	.061	.808	.005	.061	.056
	lat_pos	Sphericity Assumed	.233	2	.116	.299	.744	.022	.597	.092
		Greenhouse-Geisser	.233	1.957	.119	.299	.740	.022	.584	.092
		Huynh-Feldt	.233	2.000	.116	.299	.744	.022	.597	.092
		Lower-bound	.233	1.000	.233	.299	.594	.022	.299	.080
	veh_curv	Sphericity Assumed	2.879E-06	2	1.440E-06	2.386	.112	.155	4.771	.438
		Greenhouse-Geisser	2.879E-06	1.630	1.766E-06	2.386	.124	.155	3.889	.390
		Huynh-Feldt	2.879E-06	2.000	1.440E-06	2.386	.112	.155	4.771	.438
		Lower-bound	2.879E-06	1.000	2.879E-06	2.386	.146	.155	2.386	.299
	raod_cur	Sphericity Assumed	2.005E-06	2	1.002E-06	2.803	.079	.177	5.606	.503

	Greenhouse-Geisser	2.005E-06	1.496	1.341E-06	2.803	.097	.177	4.192	.426
	Huynh-Feldt	2.005E-06	2.000	1.002E-06	2.803	.079	.177	5.606	.503
	Lower-bound	2.005E-06	1.000	2.005E-06	2.803	.118	.177	2.803	.342
head_err	Sphericity Assumed	5.735E-05	2	2.867E-05	.524	.598	.039	1.047	.127
	Greenhouse-Geisser	5.735E-05	1.565	3.665E-05	.524	.557	.039	.819	.117
	Huynh-Feldt	5.735E-05	2.000	2.867E-05	.524	.598	.039	1.047	.127
	Lower-bound	5.735E-05	1.000	5.735E-05	.524	.482	.039	.524	.103
steer_an	Sphericity Assumed	377.203	2	188.602	1.345	.278	.094	2.690	.264
	Greenhouse-Geisser	377.203	1.538	245.329	1.345	.277	.094	2.068	.231
	Huynh-Feldt	377.203	2.000	188.602	1.345	.278	.094	2.690	.264
	Lower-bound	377.203	1.000	377.203	1.345	.267	.094	1.345	.189
acc_thr	Sphericity Assumed	2.435	2	1.218	2.953	.070	.185	5.907	.525
	Greenhouse-Geisser	2.435	1.944	1.253	2.953	.072	.185	5.741	.517
	Huynh-Feldt	2.435	2.000	1.218	2.953	.070	.185	5.907	.525
	Lower-bound	2.435	1.000	2.435	2.953	.109	.185	2.953	.357
acc_brk	Sphericity Assumed	1.667	2	.834	3.016	.066	.188	6.033	.535
	Greenhouse-Geisser	1.667	1.386	1.203	3.016	.089	.188	4.182	.435
	Huynh-Feldt	1.667	2.000	.834	3.016	.066	.188	6.033	.535
	Lower-bound	1.667	1.000	1.667	3.016	.106	.188	3.016	.363
min_ttc	Sphericity Assumed	105.794	2	52.897	1.500	.242	.103	2.999	.290
	Greenhouse-Geisser	105.794	1.408	75.147	1.500	.245	.103	2.111	.242
	Huynh-Feldt	105.794	2.000	52.897	1.500	.242	.103	2.999	.290
	Lower-bound	105.794	1.000	105.794	1.500	.242	.103	1.500	.206
sdlonacc	Sphericity Assumed	5.037	2	2.518	1.799	.185	.122	3.599	.341
	Greenhouse-Geisser	5.037	1.934	2.604	1.799	.187	.122	3.480	.335
	Huynh-Feldt	5.037	2.000	2.518	1.799	.185	.122	3.599	.341
	Lower-bound	5.037	1.000	5.037	1.799	.203	.122	1.799	.238
sdlatacc	Sphericity Assumed	4.168	2	2.084	.545	.586	.040	1.091	.130
	Greenhouse-Geisser	4.168	1.517	2.747	.545	.541	.040	.827	.119
	Huynh-Feldt	4.168	2.000	2.084	.545	.586	.040	1.091	.130
	Lower-bound	4.168	1.000	4.168	.545	.473	.040	.545	.105
sdlatpos	Sphericity Assumed	1.069	2	.535	.709	.502	.052	1.417	.157
	Greenhouse-Geisser	1.069	1.987	.538	.709	.501	.052	1.408	.156
	Huynh-Feldt	1.069	2.000	.535	.709	.502	.052	1.417	.157
	Lower-bound	1.069	1.000	1.069	.709	.415	.052	.709	.122
sdaccthr	Sphericity Assumed	2.015	2	1.007	4.972	.015	.277	9.945	.763
	Greenhouse-Geisser	2.015	1.995	1.010	4.972	.015	.277	9.918	.762
	Huynh-Feldt	2.015	2.000	1.007	4.972	.015	.277	9.945	.763

		Lower-bound	2.015	1.000	2.015	4.972	.044	.277	4.972	.541
type * NGEFT	lon_acc	Sphericity Assumed	7.691	2	3.845	2.925	.071	.184	5.850	.521
		Greenhouse-Geisser	7.691	1.852	4.153	2.925	.076	.184	5.417	.499
		Huynh-Feldt	7.691	2.000	3.845	2.925	.071	.184	5.850	.521
		Lower-bound	7.691	1.000	7.691	2.925	.111	.184	2.925	.354
	lat_acc	Sphericity Assumed	6.290	2	3.145	.791	.464	.057	1.583	.170
		Greenhouse-Geisser	6.290	1.553	4.051	.791	.437	.057	1.229	.154
		Huynh-Feldt	6.290	2.000	3.145	.791	.464	.057	1.583	.170
		Lower-bound	6.290	1.000	6.290	.791	.390	.057	.791	.131
	lon_vel	Sphericity Assumed	182.441	2	91.221	1.126	.340	.080	2.252	.226
		Greenhouse-Geisser	182.441	1.715	106.356	1.126	.334	.080	1.932	.210
		Huynh-Feldt	182.441	2.000	91.221	1.126	.340	.080	2.252	.226
		Lower-bound	182.441	1.000	182.441	1.126	.308	.080	1.126	.166
	lat_vel	Sphericity Assumed	.042	2	.021	.130	.879	.010	.260	.068
		Greenhouse-Geisser	.042	1.640	.025	.130	.839	.010	.213	.066
		Huynh-Feldt	.042	2.000	.021	.130	.879	.010	.260	.068
		Lower-bound	.042	1.000	.042	.130	.724	.010	.130	.063
	lat_pos	Sphericity Assumed	.143	2	.072	.184	.833	.014	.367	.076
		Greenhouse-Geisser	.143	1.957	.073	.184	.829	.014	.360	.075
		Huynh-Feldt	.143	2.000	.072	.184	.833	.014	.367	.076
		Lower-bound	.143	1.000	.143	.184	.675	.014	.184	.068
	veh_curv	Sphericity Assumed	3.348E-06	2	1.674E-06	2.774	.081	.176	5.548	.499
		Greenhouse-Geisser	3.348E-06	1.630	2.054E-06	2.774	.094	.176	4.522	.444
		Huynh-Feldt	3.348E-06	2.000	1.674E-06	2.774	.081	.176	5.548	.499
		Lower-bound	3.348E-06	1.000	3.348E-06	2.774	.120	.176	2.774	.339
	raod_cur	Sphericity Assumed	1.108E-06	2	5.540E-07	1.549	.231	.106	3.098	.299
		Greenhouse-Geisser	1.108E-06	1.496	7.409E-07	1.549	.236	.106	2.317	.256
		Huynh-Feldt	1.108E-06	2.000	5.540E-07	1.549	.231	.106	3.098	.299
		Lower-bound	1.108E-06	1.000	1.108E-06	1.549	.235	.106	1.549	.211
	head_err	Sphericity Assumed	2.013E-05	2	1.007E-05	.184	.833	.014	.368	.076
		Greenhouse-Geisser	2.013E-05	1.565	1.287E-05	.184	.780	.014	.288	.073
		Huynh-Feldt	2.013E-05	2.000	1.007E-05	.184	.833	.014	.368	.076
		Lower-bound	2.013E-05	1.000	2.013E-05	.184	.675	.014	.184	.068
	steer_an	Sphericity Assumed	462.768	2	231.384	1.650	.212	.113	3.300	.316
		Greenhouse-Geisser	462.768	1.538	300.980	1.650	.218	.113	2.537	.274
		Huynh-Feldt	462.768	2.000	231.384	1.650	.212	.113	3.300	.316
		Lower-bound	462.768	1.000	462.768	1.650	.221	.113	1.650	.222

	acc_thr	Sphericity Assumed	2.393	2	1.196	2.902	.073	.182	5.803	.518
		Greenhouse-Geisser	2.393	1.944	1.231	2.902	.075	.182	5.640	.509
		Huynh-Feldt	2.393	2.000	1.196	2.902	.073	.182	5.803	.518
		Lower-bound	2.393	1.000	2.393	2.902	.112	.182	2.902	.352
	acc_brk	Sphericity Assumed	1.087	2	.543	1.967	.160	.131	3.933	.369
		Greenhouse-Geisser	1.087	1.386	.784	1.967	.176	.131	2.727	.302
		Huynh-Feldt	1.087	2.000	.543	1.967	.160	.131	3.933	.369
		Lower-bound	1.087	1.000	1.087	1.967	.184	.131	1.967	.255
	min_ttc	Sphericity Assumed	56.176	2	28.088	.796	.462	.058	1.592	.171
		Greenhouse-Geisser	56.176	1.408	39.903	.796	.425	.058	1.121	.149
		Huynh-Feldt	56.176	2.000	28.088	.796	.462	.058	1.592	.171
		Lower-bound	56.176	1.000	56.176	.796	.388	.058	.796	.131
	sdlonacc	Sphericity Assumed	9.671	2	4.836	3.455	.047	.210	6.910	.595
		Greenhouse-Geisser	9.671	1.934	5.001	3.455	.049	.210	6.682	.585
		Huynh-Feldt	9.671	2.000	4.836	3.455	.047	.210	6.910	.595
		Lower-bound	9.671	1.000	9.671	3.455	.086	.210	3.455	.406
	sdlatacc	Sphericity Assumed	5.416	2	2.708	.709	.502	.052	1.417	.157
		Greenhouse-Geisser	5.416	1.517	3.570	.709	.467	.052	1.075	.141
		Huynh-Feldt	5.416	2.000	2.708	.709	.502	.052	1.417	.157
		Lower-bound	5.416	1.000	5.416	.709	.415	.052	.709	.122
	sdlatpos	Sphericity Assumed	1.862	2	.931	1.234	.308	.087	2.468	.245
		Greenhouse-Geisser	1.862	1.987	.937	1.234	.307	.087	2.452	.244
		Huynh-Feldt	1.862	2.000	.931	1.234	.308	.087	2.468	.245
		Lower-bound	1.862	1.000	1.862	1.234	.287	.087	1.234	.178
	sdaccthr	Sphericity Assumed	1.941	2	.971	4.791	.017	.269	9.582	.746
		Greenhouse-Geisser	1.941	1.995	.973	4.791	.017	.269	9.557	.746
		Huynh-Feldt	1.941	2.000	.971	4.791	.017	.269	9.582	.746
		Lower-bound	1.941	1.000	1.941	4.791	.047	.269	4.791	.526
type * NOpSpan	lon_acc	Sphericity Assumed	2.720	2	1.360	1.034	.370	.074	2.069	.211
		Greenhouse-Geisser	2.720	1.852	1.469	1.034	.366	.074	1.915	.203
		Huynh-Feldt	2.720	2.000	1.360	1.034	.370	.074	2.069	.211
		Lower-bound	2.720	1.000	2.720	1.034	.328	.074	1.034	.157
	lat_acc	Sphericity Assumed	3.614	2	1.807	.455	.640	.034	.909	.116
		Greenhouse-Geisser	3.614	1.553	2.328	.455	.592	.034	.706	.108
		Huynh-Feldt	3.614	2.000	1.807	.455	.640	.034	.909	.116
		Lower-bound	3.614	1.000	3.614	.455	.512	.034	.455	.096
	lon_vel	Sphericity Assumed	206.268	2	103.134	1.273	.297	.089	2.546	.251
		Greenhouse-Geisser	206.268	1.715	120.247	1.273	.295	.089	2.184	.233
		Huynh-Feldt	206.26	2.000	103.1	1.273	.297	.089	2.546	.251

		8		34					
	Lower-bound	206.268	1.000	206.268	1.273	.280	.089	1.273	.182
lat_vel	Sphericity Assumed	.014	2	.007	.042	.959	.003	.085	.056
	Greenhouse-Geisser	.014	1.640	.008	.042	.934	.003	.070	.055
	Huynh-Feldt	.014	2.000	.007	.042	.959	.003	.085	.056
	Lower-bound	.014	1.000	.014	.042	.840	.003	.042	.054
lat_pos	Sphericity Assumed	1.875	2	.938	2.406	.110	.156	4.812	.441
	Greenhouse-Geisser	1.875	1.957	.958	2.406	.111	.156	4.708	.436
	Huynh-Feldt	1.875	2.000	.938	2.406	.110	.156	4.812	.441
	Lower-bound	1.875	1.000	1.875	2.406	.145	.156	2.406	.301
veh_curv	Sphericity Assumed	1.234E-06	2	6.171E-07	1.023	.374	.073	2.045	.209
	Greenhouse-Geisser	1.234E-06	1.630	7.571E-07	1.023	.362	.073	1.667	.190
	Huynh-Feldt	1.234E-06	2.000	6.171E-07	1.023	.374	.073	2.045	.209
	Lower-bound	1.234E-06	1.000	1.234E-06	1.023	.330	.073	1.023	.155
raod_cur	Sphericity Assumed	1.029E-06	2	5.144E-07	1.438	.256	.100	2.877	.280
	Greenhouse-Geisser	1.029E-06	1.496	6.879E-07	1.438	.257	.100	2.151	.241
	Huynh-Feldt	1.029E-06	2.000	5.144E-07	1.438	.256	.100	2.877	.280
	Lower-bound	1.029E-06	1.000	1.029E-06	1.438	.252	.100	1.438	.199
head_err	Sphericity Assumed	3.603E-05	2	1.802E-05	.329	.723	.025	.658	.097
	Greenhouse-Geisser	3.603E-05	1.565	2.303E-05	.329	.671	.025	.515	.091
	Huynh-Feldt	3.603E-05	2.000	1.802E-05	.329	.723	.025	.658	.097
	Lower-bound	3.603E-05	1.000	3.603E-05	.329	.576	.025	.329	.083
steer_an	Sphericity Assumed	206.861	2	103.430	.737	.488	.054	1.475	.161
	Greenhouse-Geisser	206.861	1.538	134.540	.737	.457	.054	1.134	.146
	Huynh-Feldt	206.861	2.000	103.430	.737	.488	.054	1.475	.161
	Lower-bound	206.861	1.000	206.861	.737	.406	.054	.737	.125
acc_thr	Sphericity Assumed	6.585	2	3.292	7.985	.002	.381	15.969	.931
	Greenhouse-Geisser	6.585	1.944	3.387	7.985	.002	.381	15.521	.926
	Huynh-Feldt	6.585	2.000	3.292	7.985	.002	.381	15.969	.931
	Lower-bound	6.585	1.000	6.585	7.985	.014	.381	7.985	.743
acc_brk	Sphericity Assumed	.130	2	.065	.235	.792	.018	.470	.083
	Greenhouse-Geisser	.130	1.386	.094	.235	.711	.018	.326	.078
	Huynh-Feldt	.130	2.000	.065	.235	.792	.018	.470	.083
	Lower-bound	.130	1.000	.130	.235	.636	.018	.235	.074
min_ttc	Sphericity Assumed	149.999	2	74.999	2.126	.140	.141	4.252	.396
	Greenhouse-Geisser	149.999	1.408	106.546	2.126	.157	.141	2.993	.325
	Huynh-Feldt	149.999	2.000	74.999	2.126	.140	.141	4.252	.396

		Lower-bound	149.999	1.000	149.999	2.126	.169	.141	2.126	.272
	sdlonacc	Sphericity Assumed	2.139	2	1.069	.764	.476	.056	1.528	.166
		Greenhouse-Geisser	2.139	1.934	1.106	.764	.472	.056	1.478	.163
		Huynh-Feldt	2.139	2.000	1.069	.764	.476	.056	1.528	.166
		Lower-bound	2.139	1.000	2.139	.764	.398	.056	.764	.128
	sdlatacc	Sphericity Assumed	3.802	2	1.901	.498	.614	.037	.995	.123
		Greenhouse-Geisser	3.802	1.517	2.506	.498	.565	.037	.755	.113
		Huynh-Feldt	3.802	2.000	1.901	.498	.614	.037	.995	.123
		Lower-bound	3.802	1.000	3.802	.498	.493	.037	.498	.100
	sdlatpos	Sphericity Assumed	.725	2	.363	.481	.624	.036	.961	.120
		Greenhouse-Geisser	.725	1.987	.365	.481	.623	.036	.955	.120
		Huynh-Feldt	.725	2.000	.363	.481	.624	.036	.961	.120
		Lower-bound	.725	1.000	.725	.481	.500	.036	.481	.099
	sdaccthr	Sphericity Assumed	2.566	2	1.283	6.333	.006	.328	12.665	.861
		Greenhouse-Geisser	2.566	1.995	1.286	6.333	.006	.328	12.632	.860
		Huynh-Feldt	2.566	2.000	1.283	6.333	.006	.328	12.665	.861
		Lower-bound	2.566	1.000	2.566	6.333	.026	.328	6.333	.644
type * NDfC * NGEFT	lon_acc	Sphericity Assumed	2.094	2	1.047	.796	.462	.058	1.593	.171
		Greenhouse-Geisser	2.094	1.852	1.131	.796	.454	.058	1.475	.166
		Huynh-Feldt	2.094	2.000	1.047	.796	.462	.058	1.593	.171
		Lower-bound	2.094	1.000	2.094	.796	.388	.058	.796	.131
	lat_acc	Sphericity Assumed	.327	2	.164	.041	.960	.003	.082	.056
		Greenhouse-Geisser	.327	1.553	.211	.041	.927	.003	.064	.055
		Huynh-Feldt	.327	2.000	.164	.041	.960	.003	.082	.056
		Lower-bound	.327	1.000	.327	.041	.842	.003	.041	.054
	lon_vel	Sphericity Assumed	108.576	2	54.288	.670	.520	.049	1.340	.150
		Greenhouse-Geisser	108.576	1.715	63.296	.670	.500	.049	1.150	.142
		Huynh-Feldt	108.576	2.000	54.288	.670	.520	.049	1.340	.150
		Lower-bound	108.576	1.000	108.576	.670	.428	.049	.670	.118
	lat_vel	Sphericity Assumed	.163	2	.081	.507	.608	.038	1.013	.124
		Greenhouse-Geisser	.163	1.640	.099	.507	.574	.038	.831	.117
		Huynh-Feldt	.163	2.000	.081	.507	.608	.038	1.013	.124
		Lower-bound	.163	1.000	.163	.507	.489	.038	.507	.101
	lat_pos	Sphericity Assumed	.017	2	.009	.022	.978	.002	.044	.053
		Greenhouse-Geisser	.017	1.957	.009	.022	.976	.002	.043	.053
		Huynh-Feldt	.017	2.000	.009	.022	.978	.002	.044	.053
		Lower-bound	.017	1.000	.017	.022	.884	.002	.022	.052
	veh_curv	Sphericity	2.849E	2	1.424	.236	.791	.018	.472	.083

	Assumed	-07		E-07					
	Greenhouse-Geisser	2.849E-07	1.630	1.747E-07	.236	.747	.018	.385	.080
	Huynh-Feldt	2.849E-07	2.000	1.424E-07	.236	.791	.018	.472	.083
	Lower-bound	2.849E-07	1.000	2.849E-07	.236	.635	.018	.236	.074
raod_cur	Sphericity Assumed	2.384E-07	2	1.192E-07	.333	.720	.025	.667	.098
	Greenhouse-Geisser	2.384E-07	1.496	1.594E-07	.333	.659	.025	.498	.091
	Huynh-Feldt	2.384E-07	2.000	1.192E-07	.333	.720	.025	.667	.098
	Lower-bound	2.384E-07	1.000	2.384E-07	.333	.574	.025	.333	.083
head_err	Sphericity Assumed	1.449E-06	2	7.246E-07	.013	.987	.001	.026	.052
	Greenhouse-Geisser	1.449E-06	1.565	9.261E-07	.013	.970	.001	.021	.052
	Huynh-Feldt	1.449E-06	2.000	7.246E-07	.013	.987	.001	.026	.052
	Lower-bound	1.449E-06	1.000	1.449E-06	.013	.910	.001	.013	.051
steer_an	Sphericity Assumed	6.632	2	3.316	.024	.977	.002	.047	.053
	Greenhouse-Geisser	6.632	1.538	4.314	.024	.951	.002	.036	.053
	Huynh-Feldt	6.632	2.000	3.316	.024	.977	.002	.047	.053
	Lower-bound	6.632	1.000	6.632	.024	.880	.002	.024	.052
acc_thr	Sphericity Assumed	5.021	2	2.510	6.088	.007	.319	12.177	.847
	Greenhouse-Geisser	5.021	1.944	2.583	6.088	.007	.319	11.835	.838
	Huynh-Feldt	5.021	2.000	2.510	6.088	.007	.319	12.177	.847
	Lower-bound	5.021	1.000	5.021	6.088	.028	.319	6.088	.627
acc_brk	Sphericity Assumed	1.856	2	.928	3.359	.050	.205	6.718	.582
	Greenhouse-Geisser	1.856	1.386	1.339	3.359	.072	.205	4.657	.475
	Huynh-Feldt	1.856	2.000	.928	3.359	.050	.205	6.718	.582
	Lower-bound	1.856	1.000	1.856	3.359	.090	.205	3.359	.397
min_ttc	Sphericity Assumed	78.721	2	39.361	1.116	.343	.079	2.232	.225
	Greenhouse-Geisser	78.721	1.408	55.917	1.116	.328	.079	1.571	.191
	Huynh-Feldt	78.721	2.000	39.361	1.116	.343	.079	2.232	.225
	Lower-bound	78.721	1.000	78.721	1.116	.310	.079	1.116	.165
sdlonacc	Sphericity Assumed	2.788	2	1.394	.996	.383	.071	1.992	.204
	Greenhouse-Geisser	2.788	1.934	1.442	.996	.381	.071	1.926	.201
	Huynh-Feldt	2.788	2.000	1.394	.996	.383	.071	1.992	.204
	Lower-bound	2.788	1.000	2.788	.996	.336	.071	.996	.152
sdlatacc	Sphericity Assumed	.175	2	.087	.023	.977	.002	.046	.053
	Greenhouse-Geisser	.175	1.517	.115	.023	.951	.002	.035	.053
	Huynh-Feldt	.175	2.000	.087	.023	.977	.002	.046	.053
	Lower-bound	.175	1.000	.175	.023	.882	.002	.023	.052
sdlatpos	Sphericity Assumed	.000	2	8.872E-05	.000	1.000	.000	.000	.050
	Greenhouse-Geisser	.000	1.987	8.931E-05	.000	1.000	.000	.000	.050

		Huynh-Feldt	.000	2.000	8.872E-05	.000	1.000	.000	.000	.050
		Lower-bound	.000	1.000	.000	.000	.992	.000	.000	.050
	sdaccthr	Sphericity Assumed	.817	2	.408	2.015	.154	.134	4.031	.378
		Greenhouse-Geisser	.817	1.995	.409	2.015	.154	.134	4.020	.377
		Huynh-Feldt	.817	2.000	.408	2.015	.154	.134	4.031	.378
		Lower-bound	.817	1.000	.817	2.015	.179	.134	2.015	.260
type * NDfC * NOpSpan	lon_acc	Sphericity Assumed	3.140	2	1.570	1.194	.319	.084	2.388	.238
		Greenhouse-Geisser	3.140	1.852	1.696	1.194	.317	.084	2.211	.229
		Huynh-Feldt	3.140	2.000	1.570	1.194	.319	.084	2.388	.238
		Lower-bound	3.140	1.000	3.140	1.194	.294	.084	1.194	.173
	lat_acc	Sphericity Assumed	.423	2	.212	.053	.948	.004	.106	.057
		Greenhouse-Geisser	.423	1.553	.273	.053	.911	.004	.083	.056
		Huynh-Feldt	.423	2.000	.212	.053	.948	.004	.106	.057
		Lower-bound	.423	1.000	.423	.053	.821	.004	.053	.055
	lon_vel	Sphericity Assumed	15.730	2	7.865	.097	.908	.007	.194	.063
		Greenhouse-Geisser	15.730	1.715	9.170	.097	.881	.007	.167	.062
		Huynh-Feldt	15.730	2.000	7.865	.097	.908	.007	.194	.063
		Lower-bound	15.730	1.000	15.730	.097	.760	.007	.097	.060
	lat_vel	Sphericity Assumed	.088	2	.044	.273	.763	.021	.545	.088
		Greenhouse-Geisser	.088	1.640	.053	.273	.721	.021	.447	.085
		Huynh-Feldt	.088	2.000	.044	.273	.763	.021	.545	.088
		Lower-bound	.088	1.000	.088	.273	.610	.021	.273	.077
	lat_pos	Sphericity Assumed	.044	2	.022	.057	.945	.004	.113	.058
		Greenhouse-Geisser	.044	1.957	.023	.057	.942	.004	.111	.058
		Huynh-Feldt	.044	2.000	.022	.057	.945	.004	.113	.058
		Lower-bound	.044	1.000	.044	.057	.816	.004	.057	.056
	veh_curv	Sphericity Assumed	2.699E-07	2	1.349E-07	.224	.801	.017	.447	.081
		Greenhouse-Geisser	2.699E-07	1.630	1.655E-07	.224	.757	.017	.365	.078
		Huynh-Feldt	2.699E-07	2.000	1.349E-07	.224	.801	.017	.447	.081
		Lower-bound	2.699E-07	1.000	2.699E-07	.224	.644	.017	.224	.072
	raod_cur	Sphericity Assumed	1.051E-07	2	5.255E-08	.147	.864	.011	.294	.070
		Greenhouse-Geisser	1.051E-07	1.496	7.028E-08	.147	.803	.011	.220	.068
		Huynh-Feldt	1.051E-07	2.000	5.255E-08	.147	.864	.011	.294	.070
		Lower-bound	1.051E-07	1.000	1.051E-07	.147	.708	.011	.147	.065
	head_err	Sphericity Assumed	5.075E-05	2	2.538E-05	.463	.634	.034	.927	.117
		Greenhouse-Geisser	5.075E-05	1.565	3.244E-05	.463	.589	.034	.725	.109
		Huynh-Feldt	5.075E	2.000	2.538	.463	.634	.034	.927	.117

			-05		E-05					
		Lower-bound	5.075E-05	1.000	5.075E-05	.463	.508	.034	.463	.097
	steer_an	Sphericity Assumed	5.262	2	2.631	.019	.981	.001	.038	.053
		Greenhouse-Geisser	5.262	1.538	3.422	.019	.959	.001	.029	.052
		Huynh-Feldt	5.262	2.000	2.631	.019	.981	.001	.038	.053
		Lower-bound	5.262	1.000	5.262	.019	.893	.001	.019	.052
	acc_thr	Sphericity Assumed	2.514	2	1.257	3.049	.065	.190	6.097	.539
		Greenhouse-Geisser	2.514	1.944	1.293	3.049	.066	.190	5.926	.531
		Huynh-Feldt	2.514	2.000	1.257	3.049	.065	.190	6.097	.539
		Lower-bound	2.514	1.000	2.514	3.049	.104	.190	3.049	.366
	acc_brk	Sphericity Assumed	.460	2	.230	.832	.446	.060	1.665	.177
		Greenhouse-Geisser	.460	1.386	.332	.832	.411	.060	1.154	.152
		Huynh-Feldt	.460	2.000	.230	.832	.446	.060	1.665	.177
		Lower-bound	.460	1.000	.460	.832	.378	.060	.832	.135
	min_ttc	Sphericity Assumed	63.209	2	31.605	.896	.420	.064	1.792	.188
		Greenhouse-Geisser	63.209	1.408	44.898	.896	.391	.064	1.261	.162
		Huynh-Feldt	63.209	2.000	31.605	.896	.420	.064	1.792	.188
		Lower-bound	63.209	1.000	63.209	.896	.361	.064	.896	.142
	sdlonacc	Sphericity Assumed	1.722	2	.861	.615	.548	.045	1.231	.141
		Greenhouse-Geisser	1.722	1.934	.891	.615	.543	.045	1.190	.140
		Huynh-Feldt	1.722	2.000	.861	.615	.548	.045	1.231	.141
		Lower-bound	1.722	1.000	1.722	.615	.447	.045	.615	.113
	sdlatacc	Sphericity Assumed	.485	2	.242	.063	.939	.005	.127	.059
		Greenhouse-Geisser	.485	1.517	.320	.063	.895	.005	.096	.058
		Huynh-Feldt	.485	2.000	.242	.063	.939	.005	.127	.059
		Lower-bound	.485	1.000	.485	.063	.805	.005	.063	.056
	sdlatpos	Sphericity Assumed	.157	2	.079	.104	.901	.008	.209	.064
		Greenhouse-Geisser	.157	1.987	.079	.104	.900	.008	.207	.064
		Huynh-Feldt	.157	2.000	.079	.104	.901	.008	.209	.064
		Lower-bound	.157	1.000	.157	.104	.752	.008	.104	.060
	sdaccthr	Sphericity Assumed	.193	2	.097	.477	.626	.035	.955	.120
		Greenhouse-Geisser	.193	1.995	.097	.477	.625	.035	.952	.120
		Huynh-Feldt	.193	2.000	.097	.477	.626	.035	.955	.120
		Lower-bound	.193	1.000	.193	.477	.502	.035	.477	.098
type * NGEFT * NOpSpan	lon_acc	Sphericity Assumed	1.594	2	.797	.606	.553	.045	1.213	.140
		Greenhouse-Geisser	1.594	1.852	.861	.606	.541	.045	1.123	.136
		Huynh-Feldt	1.594	2.000	.797	.606	.553	.045	1.213	.140
		Lower-bound	1.594	1.000	1.594	.606	.450	.045	.606	.112

lat_acc	Sphericity Assumed	2.418	2	1.209	.304	.740	.023	.608	.093
	Greenhouse-Geisser	2.418	1.553	1.557	.304	.686	.023	.472	.088
	Huynh-Feldt	2.418	2.000	1.209	.304	.740	.023	.608	.093
	Lower-bound	2.418	1.000	2.418	.304	.591	.023	.304	.081
lon_vel	Sphericity Assumed	32.285	2	16.143	.199	.821	.015	.399	.078
	Greenhouse-Geisser	32.285	1.715	18.821	.199	.788	.015	.342	.076
	Huynh-Feldt	32.285	2.000	16.143	.199	.821	.015	.399	.078
	Lower-bound	32.285	1.000	32.285	.199	.663	.015	.199	.070
lat_vel	Sphericity Assumed	.029	2	.015	.091	.913	.007	.183	.062
	Greenhouse-Geisser	.029	1.640	.018	.091	.878	.007	.150	.061
	Huynh-Feldt	.029	2.000	.015	.091	.913	.007	.183	.062
	Lower-bound	.029	1.000	.029	.091	.767	.007	.091	.059
lat_pos	Sphericity Assumed	.121	2	.061	.156	.857	.012	.311	.072
	Greenhouse-Geisser	.121	1.957	.062	.156	.852	.012	.305	.071
	Huynh-Feldt	.121	2.000	.061	.156	.857	.012	.311	.072
	Lower-bound	.121	1.000	.121	.156	.700	.012	.156	.066
veh_curv	Sphericity Assumed	1.296E-08	2	6.480E-09	.011	.989	.001	.021	.051
	Greenhouse-Geisser	1.296E-08	1.630	7.950E-09	.011	.978	.001	.018	.051
	Huynh-Feldt	1.296E-08	2.000	6.480E-09	.011	.989	.001	.021	.051
	Lower-bound	1.296E-08	1.000	1.296E-08	.011	.919	.001	.011	.051
raod_cur	Sphericity Assumed	1.083E-07	2	5.415E-08	.151	.860	.012	.303	.071
	Greenhouse-Geisser	1.083E-07	1.496	7.242E-08	.151	.799	.012	.226	.068
	Huynh-Feldt	1.083E-07	2.000	5.415E-08	.151	.860	.012	.303	.071
	Lower-bound	1.083E-07	1.000	1.083E-07	.151	.703	.012	.151	.065
head_err	Sphericity Assumed	3.039E-05	2	1.519E-05	.277	.760	.021	.555	.089
	Greenhouse-Geisser	3.039E-05	1.565	1.942E-05	.277	.707	.021	.434	.085
	Huynh-Feldt	3.039E-05	2.000	1.519E-05	.277	.760	.021	.555	.089
	Lower-bound	3.039E-05	1.000	3.039E-05	.277	.607	.021	.277	.078
steer_an	Sphericity Assumed	29.060	2	14.530	.104	.902	.008	.207	.064
	Greenhouse-Geisser	29.060	1.538	18.900	.104	.852	.008	.159	.063
	Huynh-Feldt	29.060	2.000	14.530	.104	.902	.008	.207	.064
	Lower-bound	29.060	1.000	29.060	.104	.753	.008	.104	.060
acc_thr	Sphericity Assumed	3.102	2	1.551	3.762	.037	.224	7.524	.635
	Greenhouse-Geisser	3.102	1.944	1.596	3.762	.038	.224	7.313	.625
	Huynh-Feldt	3.102	2.000	1.551	3.762	.037	.224	7.524	.635
	Lower-bound	3.102	1.000	3.102	3.762	.074	.224	3.762	.435
acc_brk	Sphericity Assumed	.663	2	.332	1.200	.317	.085	2.401	.239

		Greenhouse-Geisser	.663	1.386	.479	1.200	.307	.085	1.664	.200
		Huynh-Feldt	.663	2.000	.332	1.200	.317	.085	2.401	.239
		Lower-bound	.663	1.000	.663	1.200	.293	.085	1.200	.174
	min_ttc	Sphericity Assumed	77.509	2	38.754	1.099	.348	.078	2.197	.222
		Greenhouse-Geisser	77.509	1.408	55.056	1.099	.333	.078	1.547	.188
		Huynh-Feldt	77.509	2.000	38.754	1.099	.348	.078	2.197	.222
		Lower-bound	77.509	1.000	77.509	1.099	.314	.078	1.099	.163
	sdlonacc	Sphericity Assumed	1.558	2	.779	.556	.580	.041	1.113	.132
		Greenhouse-Geisser	1.558	1.934	.805	.556	.574	.041	1.076	.131
		Huynh-Feldt	1.558	2.000	.779	.556	.580	.041	1.113	.132
		Lower-bound	1.558	1.000	1.558	.556	.469	.041	.556	.106
	sdlatacc	Sphericity Assumed	2.726	2	1.363	.357	.703	.027	.713	.101
		Greenhouse-Geisser	2.726	1.517	1.797	.357	.646	.027	.541	.094
		Huynh-Feldt	2.726	2.000	1.363	.357	.703	.027	.713	.101
		Lower-bound	2.726	1.000	2.726	.357	.561	.027	.357	.086
	sdlatpos	Sphericity Assumed	.067	2	.033	.044	.957	.003	.089	.056
		Greenhouse-Geisser	.067	1.987	.034	.044	.956	.003	.088	.056
		Huynh-Feldt	.067	2.000	.033	.044	.957	.003	.089	.056
		Lower-bound	.067	1.000	.067	.044	.836	.003	.044	.054
	sdaccthr	Sphericity Assumed	.364	2	.182	.898	.420	.065	1.795	.188
		Greenhouse-Geisser	.364	1.995	.182	.898	.420	.065	1.790	.188
		Huynh-Feldt	.364	2.000	.182	.898	.420	.065	1.795	.188
		Lower-bound	.364	1.000	.364	.898	.361	.065	.898	.142
Error(type)	lon_acc	Sphericity Assumed	34.181	26	1.315					
		Greenhouse-Geisser	34.181	24.073	1.420					
		Huynh-Feldt	34.181	26.000	1.315					
		Lower-bound	34.181	13.000	2.629					
	lat_acc	Sphericity Assumed	103.334	26	3.974					
		Greenhouse-Geisser	103.334	20.184	5.120					
		Huynh-Feldt	103.334	26.000	3.974					
		Lower-bound	103.334	13.000	7.949					
	lon_vel	Sphericity Assumed	2106.216	26	81.008					
		Greenhouse-Geisser	2106.216	22.300	94.450					
		Huynh-Feldt	2106.216	26.000	81.008					
		Lower-bound	2106.216	13.000	162.017					
	lat_vel	Sphericity Assumed	4.171	26	.160					
		Greenhouse-Geisser	4.171	21.326	.196					
		Huynh-Feldt	4.171	26.000	.160					

	Lower-bound	4.171	13.000	.321					
lat_pos	Sphericity Assumed	10.130	26	.390					
	Greenhouse-Geisser	10.130	25.438	.398					
	Huynh-Feldt	10.130	26.000	.390					
	Lower-bound	10.130	13.000	.779					
veh_curv	Sphericity Assumed	1.569E-05	26	6.035E-07					
	Greenhouse-Geisser	1.569E-05	21.194	7.403E-07					
	Huynh-Feldt	1.569E-05	26.000	6.035E-07					
	Lower-bound	1.569E-05	13.000	1.207E-06					
raod_cur	Sphericity Assumed	9.299E-06	26	3.576E-07					
	Greenhouse-Geisser	9.299E-06	19.442	4.783E-07					
	Huynh-Feldt	9.299E-06	26.000	3.576E-07					
	Lower-bound	9.299E-06	13.000	7.153E-07					
head_err	Sphericity Assumed	.001	26	5.476E-05					
	Greenhouse-Geisser	.001	20.343	6.998E-05					
	Huynh-Feldt	.001	26.000	5.476E-05					
	Lower-bound	.001	13.000	.000					
steer_an	Sphericity Assumed	3646.464	26	140.249					
	Greenhouse-Geisser	3646.464	19.988	182.433					
	Huynh-Feldt	3646.464	26.000	140.249					
	Lower-bound	3646.464	13.000	280.497					
acc_thr	Sphericity Assumed	10.720	26	.412					
	Greenhouse-Geisser	10.720	25.269	.424					
	Huynh-Feldt	10.720	26.000	.412					
	Lower-bound	10.720	13.000	.825					
acc_brk	Sphericity Assumed	7.185	26	.276					
	Greenhouse-Geisser	7.185	18.024	.399					
	Huynh-Feldt	7.185	26.000	.276					
	Lower-bound	7.185	13.000	.553					
min_ttc	Sphericity Assumed	917.163	26	35.276					
	Greenhouse-Geisser	917.163	18.302	50.113					
	Huynh-Feldt	917.163	26.000	35.276					
	Lower-bound	917.163	13.000	70.551					
sdlonacc	Sphericity Assumed	36.389	26	1.400					
	Greenhouse-Geisser	36.389	25.143	1.447					
	Huynh-Feldt	36.389	26.000	1.400					
	Lower-bound	36.389	13.000	2.799					
sdlatacc	Sphericity	99.356	26	3.821					

		Assumed								
		Greenhouse-Geisser	99.356	19.723	5.038					
		Huynh-Feldt	99.356	26.000	3.821					
		Lower-bound	99.356	13.000	7.643					
	sdlatpos	Sphericity Assumed	19.616	26	.754					
		Greenhouse-Geisser	19.616	25.828	.759					
		Huynh-Feldt	19.616	26.000	.754					
		Lower-bound	19.616	13.000	1.509					
	sdaccthr	Sphericity Assumed	5.267	26	.203					
		Greenhouse-Geisser	5.267	25.931	.203					
		Huynh-Feldt	5.267	26.000	.203					
		Lower-bound	5.267	13.000	.405					
state	lon_acc	Sphericity Assumed	.660	2	.330	.499	.613	.037	.998	.123
		Greenhouse-Geisser	.660	1.718	.384	.499	.586	.037	.857	.117
		Huynh-Feldt	.660	2.000	.330	.499	.613	.037	.998	.123
		Lower-bound	.660	1.000	.660	.499	.492	.037	.499	.100
	lat_acc	Sphericity Assumed	8.903	2	4.451	2.885	.074	.182	5.769	.515
		Greenhouse-Geisser	8.903	1.955	4.554	2.885	.075	.182	5.639	.509
		Huynh-Feldt	8.903	2.000	4.451	2.885	.074	.182	5.769	.515
		Lower-bound	8.903	1.000	8.903	2.885	.113	.182	2.885	.350
	lon_vel	Sphericity Assumed	82.945	2	41.472	2.666	.088	.170	5.333	.482
		Greenhouse-Geisser	82.945	1.574	52.707	2.666	.104	.170	4.196	.421
		Huynh-Feldt	82.945	2.000	41.472	2.666	.088	.170	5.333	.482
		Lower-bound	82.945	1.000	82.945	2.666	.126	.170	2.666	.328
	lat_vel	Sphericity Assumed	.081	2	.041	.609	.552	.045	1.218	.140
		Greenhouse-Geisser	.081	1.864	.043	.609	.541	.045	1.135	.137
		Huynh-Feldt	.081	2.000	.041	.609	.552	.045	1.218	.140
		Lower-bound	.081	1.000	.081	.609	.449	.045	.609	.112
	lat_pos	Sphericity Assumed	.167	2	.084	.429	.656	.032	.857	.112
		Greenhouse-Geisser	.167	1.494	.112	.429	.600	.032	.640	.103
		Huynh-Feldt	.167	2.000	.084	.429	.656	.032	.857	.112
		Lower-bound	.167	1.000	.167	.429	.524	.032	.429	.093
	veh_curv	Sphericity Assumed	1.094E-07	2	5.471E-08	.361	.701	.027	.721	.102
		Greenhouse-Geisser	1.094E-07	1.721	6.356E-08	.361	.670	.027	.621	.098
		Huynh-Feldt	1.094E-07	2.000	5.471E-08	.361	.701	.027	.721	.102
		Lower-bound	1.094E-07	1.000	1.094E-07	.361	.558	.027	.361	.086
	raod_cur	Sphericity Assumed	2.773E-07	2	1.386E-07	1.270	.298	.089	2.541	.251
		Greenhouse-Geisser	2.773E-07	1.817	1.526E-07	1.270	.296	.089	2.309	.239
		Huynh-Feldt	2.773E-07	2.000	1.386E-07	1.270	.298	.089	2.541	.251

		Lower-bound	2.773E-07	1.000	2.773E-07	1.270	.280	.089	1.270	.182
	head_err	Sphericity Assumed	3.882E-05	2	1.941E-05	1.457	.251	.101	2.915	.283
		Greenhouse-Geisser	3.882E-05	1.702	2.281E-05	1.457	.253	.101	2.480	.260
		Huynh-Feldt	3.882E-05	2.000	1.941E-05	1.457	.251	.101	2.915	.283
		Lower-bound	3.882E-05	1.000	3.882E-05	1.457	.249	.101	1.457	.201
	steer_an	Sphericity Assumed	159.509	2	79.755	1.905	.169	.128	3.811	.359
		Greenhouse-Geisser	159.509	1.720	92.737	1.905	.176	.128	3.277	.330
		Huynh-Feldt	159.509	2.000	79.755	1.905	.169	.128	3.811	.359
		Lower-bound	159.509	1.000	159.509	1.905	.191	.128	1.905	.249
	acc_thr	Sphericity Assumed	.187	2	.094	.364	.699	.027	.727	.102
		Greenhouse-Geisser	.187	1.363	.137	.364	.620	.027	.495	.093
		Huynh-Feldt	.187	2.000	.094	.364	.699	.027	.727	.102
		Lower-bound	.187	1.000	.187	.364	.557	.027	.364	.087
	acc_brk	Sphericity Assumed	.012	2	.006	.039	.961	.003	.079	.055
		Greenhouse-Geisser	.012	1.225	.010	.039	.889	.003	.048	.054
		Huynh-Feldt	.012	1.911	.006	.039	.957	.003	.075	.055
		Lower-bound	.012	1.000	.012	.039	.846	.003	.039	.054
	min_ttc	Sphericity Assumed	161.616	2	80.808	3.390	.049	.207	6.780	.587
		Greenhouse-Geisser	161.616	1.657	97.546	3.390	.060	.207	5.616	.529
		Huynh-Feldt	161.616	2.000	80.808	3.390	.049	.207	6.780	.587
		Lower-bound	161.616	1.000	161.616	3.390	.089	.207	3.390	.400
	sdlonacc	Sphericity Assumed	.722	2	.361	.483	.623	.036	.965	.120
		Greenhouse-Geisser	.722	1.858	.389	.483	.609	.036	.896	.118
		Huynh-Feldt	.722	2.000	.361	.483	.623	.036	.965	.120
		Lower-bound	.722	1.000	.722	.483	.500	.036	.483	.099
	sdlatacc	Sphericity Assumed	8.864	2	4.432	3.123	.061	.194	6.246	.550
		Greenhouse-Geisser	8.864	1.971	4.497	3.123	.062	.194	6.155	.545
		Huynh-Feldt	8.864	2.000	4.432	3.123	.061	.194	6.246	.550
		Lower-bound	8.864	1.000	8.864	3.123	.101	.194	3.123	.374
	sdlatpos	Sphericity Assumed	1.149	2	.574	1.313	.286	.092	2.626	.258
		Greenhouse-Geisser	1.149	1.836	.626	1.313	.286	.092	2.410	.247
		Huynh-Feldt	1.149	2.000	.574	1.313	.286	.092	2.626	.258
		Lower-bound	1.149	1.000	1.149	1.313	.272	.092	1.313	.186
	sdaccthr	Sphericity Assumed	.195	2	.098	.327	.724	.025	.654	.097
		Greenhouse-Geisser	.195	1.959	.100	.327	.720	.025	.641	.096
		Huynh-Feldt	.195	2.000	.098	.327	.724	.025	.654	.097
		Lower-bound	.195	1.000	.195	.327	.577	.025	.327	.083
state * NDfC	lon_acc	Sphericity Assumed	5.282	2	2.641	3.994	.031	.235	7.989	.663

	Greenhouse-Geisser	5.282	1.718	3.075	3.994	.038	.235	6.861	.613
	Huynh-Feldt	5.282	2.000	2.641	3.994	.031	.235	7.989	.663
	Lower-bound	5.282	1.000	5.282	3.994	.067	.235	3.994	.457
lat_acc	Sphericity Assumed	4.592	2	2.296	1.488	.244	.103	2.976	.288
	Greenhouse-Geisser	4.592	1.955	2.349	1.488	.245	.103	2.909	.285
	Huynh-Feldt	4.592	2.000	2.296	1.488	.244	.103	2.976	.288
	Lower-bound	4.592	1.000	4.592	1.488	.244	.103	1.488	.205
lon_vel	Sphericity Assumed	38.013	2	19.006	1.222	.311	.086	2.444	.243
	Greenhouse-Geisser	38.013	1.574	24.155	1.222	.306	.086	1.923	.216
	Huynh-Feldt	38.013	2.000	19.006	1.222	.311	.086	2.444	.243
	Lower-bound	38.013	1.000	38.013	1.222	.289	.086	1.222	.176
lat_vel	Sphericity Assumed	.264	2	.132	1.983	.158	.132	3.966	.372
	Greenhouse-Geisser	.264	1.864	.142	1.983	.162	.132	3.696	.358
	Huynh-Feldt	.264	2.000	.132	1.983	.158	.132	3.966	.372
	Lower-bound	.264	1.000	.264	1.983	.183	.132	1.983	.257
lat_pos	Sphericity Assumed	.836	2	.418	2.142	.138	.141	4.283	.398
	Greenhouse-Geisser	.836	1.494	.560	2.142	.153	.141	3.199	.338
	Huynh-Feldt	.836	2.000	.418	2.142	.138	.141	4.283	.398
	Lower-bound	.836	1.000	.836	2.142	.167	.141	2.142	.274
veh_curv	Sphericity Assumed	2.901E-07	2	1.451E-07	.957	.397	.069	1.913	.198
	Greenhouse-Geisser	2.901E-07	1.721	1.685E-07	.957	.387	.069	1.646	.185
	Huynh-Feldt	2.901E-07	2.000	1.451E-07	.957	.397	.069	1.913	.198
	Lower-bound	2.901E-07	1.000	2.901E-07	.957	.346	.069	.957	.148
raod_cur	Sphericity Assumed	4.778E-08	2	2.389E-08	.219	.805	.017	.438	.081
	Greenhouse-Geisser	4.778E-08	1.817	2.629E-08	.219	.784	.017	.398	.079
	Huynh-Feldt	4.778E-08	2.000	2.389E-08	.219	.805	.017	.438	.081
	Lower-bound	4.778E-08	1.000	4.778E-08	.219	.648	.017	.219	.072
head_err	Sphericity Assumed	7.050E-05	2	3.525E-05	2.647	.090	.169	5.294	.479
	Greenhouse-Geisser	7.050E-05	1.702	4.143E-05	2.647	.100	.169	4.504	.437
	Huynh-Feldt	7.050E-05	2.000	3.525E-05	2.647	.090	.169	5.294	.479
	Lower-bound	7.050E-05	1.000	7.050E-05	2.647	.128	.169	2.647	.326
steer_an	Sphericity Assumed	136.134	2	68.067	1.626	.216	.111	3.252	.312
	Greenhouse-Geisser	136.134	1.720	79.147	1.626	.220	.111	2.797	.287
	Huynh-Feldt	136.134	2.000	68.067	1.626	.216	.111	3.252	.312
	Lower-bound	136.134	1.000	136.134	1.626	.225	.111	1.626	.219
acc_thr	Sphericity Assumed	.568	2	.284	1.103	.347	.078	2.207	.223
	Greenhouse-Geisser	.568	1.363	.417	1.103	.330	.078	1.504	.186

		Huynh-Feldt	.568	2.000	.284	1.103	.347	.078	2.207	.223
		Lower-bound	.568	1.000	.568	1.103	.313	.078	1.103	.164
	acc_brk	Sphericity Assumed	.635	2	.318	2.024	.152	.135	4.049	.379
		Greenhouse-Geisser	.635	1.225	.518	2.024	.173	.135	2.480	.290
		Huynh-Feldt	.635	1.911	.332	2.024	.155	.135	3.869	.369
		Lower-bound	.635	1.000	.635	2.024	.178	.135	2.024	.261
	min_ttc	Sphericity Assumed	12.011	2	6.006	.252	.779	.019	.504	.085
		Greenhouse-Geisser	12.011	1.657	7.250	.252	.738	.019	.417	.082
		Huynh-Feldt	12.011	2.000	6.006	.252	.779	.019	.504	.085
		Lower-bound	12.011	1.000	12.011	.252	.624	.019	.252	.075
	sdlonacc	Sphericity Assumed	5.057	2	2.528	3.381	.050	.206	6.762	.585
		Greenhouse-Geisser	5.057	1.858	2.722	3.381	.054	.206	6.280	.562
		Huynh-Feldt	5.057	2.000	2.528	3.381	.050	.206	6.762	.585
		Lower-bound	5.057	1.000	5.057	3.381	.089	.206	3.381	.399
	sdlatacc	Sphericity Assumed	4.587	2	2.293	1.616	.218	.111	3.232	.310
		Greenhouse-Geisser	4.587	1.971	2.327	1.616	.218	.111	3.185	.308
		Huynh-Feldt	4.587	2.000	2.293	1.616	.218	.111	3.232	.310
		Lower-bound	4.587	1.000	4.587	1.616	.226	.111	1.616	.218
	sdlatpos	Sphericity Assumed	.870	2	.435	.995	.383	.071	1.990	.204
		Greenhouse-Geisser	.870	1.836	.474	.995	.378	.071	1.826	.196
		Huynh-Feldt	.870	2.000	.435	.995	.383	.071	1.990	.204
		Lower-bound	.870	1.000	.870	.995	.337	.071	.995	.152
	sdaccthr	Sphericity Assumed	.470	2	.235	.787	.466	.057	1.575	.170
		Greenhouse-Geisser	.470	1.959	.240	.787	.463	.057	1.543	.168
		Huynh-Feldt	.470	2.000	.235	.787	.466	.057	1.575	.170
		Lower-bound	.470	1.000	.470	.787	.391	.057	.787	.131
state * NGEFT	lon_acc	Sphericity Assumed	2.392	2	1.196	1.809	.184	.122	3.618	.343
		Greenhouse-Geisser	2.392	1.718	1.393	1.809	.190	.122	3.108	.315
		Huynh-Feldt	2.392	2.000	1.196	1.809	.184	.122	3.618	.343
		Lower-bound	2.392	1.000	2.392	1.809	.202	.122	1.809	.239
	lat_acc	Sphericity Assumed	18.440	2	9.220	5.975	.007	.315	11.950	.839
		Greenhouse-Geisser	18.440	1.955	9.433	5.975	.008	.315	11.680	.833
		Huynh-Feldt	18.440	2.000	9.220	5.975	.007	.315	11.950	.839
		Lower-bound	18.440	1.000	18.440	5.975	.030	.315	5.975	.619
	lon_vel	Sphericity Assumed	21.874	2	10.937	.703	.504	.051	1.406	.156
		Greenhouse-Geisser	21.874	1.574	13.900	.703	.474	.051	1.107	.142
		Huynh-Feldt	21.874	2.000	10.937	.703	.504	.051	1.406	.156
		Lower-bound	21.874	1.000	21.874	.703	.417	.051	.703	.122
	lat_vel	Sphericity	.219	2	.109	1.646	.212	.112	3.292	.315

	Assumed								
	Greenhouse-Geisser	.219	1.864	.118	1.646	.214	.112	3.068	.303
	Huynh-Feldt	.219	2.000	.109	1.646	.212	.112	3.292	.315
	Lower-bound	.219	1.000	.219	1.646	.222	.112	1.646	.221
lat_pos	Sphericity Assumed	.332	2	.166	.850	.439	.061	1.700	.180
	Greenhouse-Geisser	.332	1.494	.222	.850	.412	.061	1.270	.159
	Huynh-Feldt	.332	2.000	.166	.850	.439	.061	1.700	.180
	Lower-bound	.332	1.000	.332	.850	.373	.061	.850	.137
veh_curv	Sphericity Assumed	9.777E-07	2	4.889E-07	3.224	.056	.199	6.448	.564
	Greenhouse-Geisser	9.777E-07	1.721	5.680E-07	3.224	.065	.199	5.549	.519
	Huynh-Feldt	9.777E-07	2.000	4.889E-07	3.224	.056	.199	6.448	.564
	Lower-bound	9.777E-07	1.000	9.777E-07	3.224	.096	.199	3.224	.383
raod_cur	Sphericity Assumed	3.582E-07	2	1.791E-07	1.641	.213	.112	3.283	.314
	Greenhouse-Geisser	3.582E-07	1.817	1.971E-07	1.641	.216	.112	2.983	.298
	Huynh-Feldt	3.582E-07	2.000	1.791E-07	1.641	.213	.112	3.283	.314
	Lower-bound	3.582E-07	1.000	3.582E-07	1.641	.223	.112	1.641	.221
head_err	Sphericity Assumed	4.879E-05	2	2.439E-05	1.832	.180	.124	3.663	.347
	Greenhouse-Geisser	4.879E-05	1.702	2.867E-05	1.832	.187	.124	3.117	.317
	Huynh-Feldt	4.879E-05	2.000	2.439E-05	1.832	.180	.124	3.663	.347
	Lower-bound	4.879E-05	1.000	4.879E-05	1.832	.199	.124	1.832	.241
steer_an	Sphericity Assumed	499.853	2	249.926	5.971	.007	.315	11.942	.839
	Greenhouse-Geisser	499.853	1.720	290.610	5.971	.011	.315	10.271	.793
	Huynh-Feldt	499.853	2.000	249.926	5.971	.007	.315	11.942	.839
	Lower-bound	499.853	1.000	499.853	5.971	.030	.315	5.971	.618
acc_thr	Sphericity Assumed	.020	2	.010	.038	.963	.003	.076	.055
	Greenhouse-Geisser	.020	1.363	.014	.038	.911	.003	.052	.054
	Huynh-Feldt	.020	2.000	.010	.038	.963	.003	.076	.055
	Lower-bound	.020	1.000	.020	.038	.849	.003	.038	.054
acc_brk	Sphericity Assumed	.075	2	.037	.239	.789	.018	.477	.083
	Greenhouse-Geisser	.075	1.225	.061	.239	.680	.018	.292	.076
	Huynh-Feldt	.075	1.911	.039	.239	.780	.018	.456	.083
	Lower-bound	.075	1.000	.075	.239	.633	.018	.239	.074
min_ttc	Sphericity Assumed	1.951	2	.975	.041	.960	.003	.082	.056
	Greenhouse-Geisser	1.951	1.657	1.178	.041	.937	.003	.068	.055
	Huynh-Feldt	1.951	2.000	.975	.041	.960	.003	.082	.056
	Lower-bound	1.951	1.000	1.951	.041	.843	.003	.041	.054
sdlonacc	Sphericity Assumed	2.386	2	1.193	1.595	.222	.109	3.190	.307
	Greenhouse-Geisser	2.386	1.858	1.284	1.595	.224	.109	2.963	.294

		Huynh-Feldt	2.386	2.000	1.193	1.595	.222	.109	3.190	.307
		Lower-bound	2.386	1.000	2.386	1.595	.229	.109	1.595	.216
	sdlatacc	Sphericity Assumed	16.862	2	8.431	5.941	.008	.314	11.882	.837
		Greenhouse-Geisser	16.862	1.971	8.555	5.941	.008	.314	11.709	.833
		Huynh-Feldt	16.862	2.000	8.431	5.941	.008	.314	11.882	.837
		Lower-bound	16.862	1.000	16.862	5.941	.030	.314	5.941	.616
	sdlatpos	Sphericity Assumed	.491	2	.246	.562	.577	.041	1.123	.133
		Greenhouse-Geisser	.491	1.836	.268	.562	.563	.041	1.031	.129
		Huynh-Feldt	.491	2.000	.246	.562	.577	.041	1.123	.133
		Lower-bound	.491	1.000	.491	.562	.467	.041	.562	.107
	sdaccthr	Sphericity Assumed	.482	2	.241	.808	.457	.058	1.615	.173
		Greenhouse-Geisser	.482	1.959	.246	.808	.455	.058	1.583	.171
		Huynh-Feldt	.482	2.000	.241	.808	.457	.058	1.615	.173
		Lower-bound	.482	1.000	.482	.808	.385	.058	.808	.133
state * NOpSpan	lon_acc	Sphericity Assumed	3.747	2	1.874	2.834	.077	.179	5.668	.508
		Greenhouse-Geisser	3.747	1.718	2.181	2.834	.087	.179	4.868	.466
		Huynh-Feldt	3.747	2.000	1.874	2.834	.077	.179	5.668	.508
		Lower-bound	3.747	1.000	3.747	2.834	.116	.179	2.834	.345
	lat_acc	Sphericity Assumed	3.197	2	1.599	1.036	.369	.074	2.072	.211
		Greenhouse-Geisser	3.197	1.955	1.636	1.036	.368	.074	2.025	.209
		Huynh-Feldt	3.197	2.000	1.599	1.036	.369	.074	2.072	.211
		Lower-bound	3.197	1.000	3.197	1.036	.327	.074	1.036	.157
	lon_vel	Sphericity Assumed	42.740	2	21.370	1.374	.271	.096	2.748	.269
		Greenhouse-Geisser	42.740	1.574	27.159	1.374	.270	.096	2.162	.238
		Huynh-Feldt	42.740	2.000	21.370	1.374	.271	.096	2.748	.269
		Lower-bound	42.740	1.000	42.740	1.374	.262	.096	1.374	.192
	lat_vel	Sphericity Assumed	.313	2	.156	2.351	.115	.153	4.702	.433
		Greenhouse-Geisser	.313	1.864	.168	2.351	.120	.153	4.382	.415
		Huynh-Feldt	.313	2.000	.156	2.351	.115	.153	4.702	.433
		Lower-bound	.313	1.000	.313	2.351	.149	.153	2.351	.295
	lat_pos	Sphericity Assumed	.521	2	.261	1.335	.281	.093	2.670	.262
		Greenhouse-Geisser	.521	1.494	.349	1.335	.278	.093	1.994	.226
		Huynh-Feldt	.521	2.000	.261	1.335	.281	.093	2.670	.262
		Lower-bound	.521	1.000	.521	1.335	.269	.093	1.335	.188
	veh_curv	Sphericity Assumed	5.470E-07	2	2.735E-07	1.804	.185	.122	3.607	.342
		Greenhouse-Geisser	5.470E-07	1.721	3.178E-07	1.804	.191	.122	3.105	.315
		Huynh-Feldt	5.470E-07	2.000	2.735E-07	1.804	.185	.122	3.607	.342
		Lower-bound	5.470E-07	1.000	5.470E-07	1.804	.202	.122	1.804	.238

raod_cur	Sphericity Assumed	1.048E-07	2	5.241E-08	.480	.624	.036	.961	.120
	Greenhouse-Geisser	1.048E-07	1.817	5.769E-08	.480	.607	.036	.873	.117
	Huynh-Feldt	1.048E-07	2.000	5.241E-08	.480	.624	.036	.961	.120
	Lower-bound	1.048E-07	1.000	1.048E-07	.480	.500	.036	.480	.099
head_err	Sphericity Assumed	7.791E-05	2	3.895E-05	2.925	.071	.184	5.850	.521
	Greenhouse-Geisser	7.791E-05	1.702	4.579E-05	2.925	.082	.184	4.977	.476
	Huynh-Feldt	7.791E-05	2.000	3.895E-05	2.925	.071	.184	5.850	.521
	Lower-bound	7.791E-05	1.000	7.791E-05	2.925	.111	.184	2.925	.354
steer_an	Sphericity Assumed	131.652	2	65.826	1.573	.227	.108	3.145	.303
	Greenhouse-Geisser	131.652	1.720	76.541	1.573	.230	.108	2.705	.279
	Huynh-Feldt	131.652	2.000	65.826	1.573	.227	.108	3.145	.303
	Lower-bound	131.652	1.000	131.652	1.573	.232	.108	1.573	.214
acc_thr	Sphericity Assumed	2.317	2	1.158	4.501	.021	.257	9.002	.718
	Greenhouse-Geisser	2.317	1.363	1.701	4.501	.038	.257	6.133	.592
	Huynh-Feldt	2.317	2.000	1.158	4.501	.021	.257	9.002	.718
	Lower-bound	2.317	1.000	2.317	4.501	.054	.257	4.501	.502
acc_brk	Sphericity Assumed	.336	2	.168	1.071	.357	.076	2.141	.217
	Greenhouse-Geisser	.336	1.225	.274	1.071	.332	.076	1.312	.174
	Huynh-Feldt	.336	1.911	.176	1.071	.355	.076	2.047	.212
	Lower-bound	.336	1.000	.336	1.071	.320	.076	1.071	.160
min_ttc	Sphericity Assumed	26.841	2	13.421	.563	.576	.042	1.126	.133
	Greenhouse-Geisser	26.841	1.657	16.200	.563	.546	.042	.933	.125
	Huynh-Feldt	26.841	2.000	13.421	.563	.576	.042	1.126	.133
	Lower-bound	26.841	1.000	26.841	.563	.466	.042	.563	.107
sdlonacc	Sphericity Assumed	2.439	2	1.219	1.630	.215	.111	3.261	.313
	Greenhouse-Geisser	2.439	1.858	1.313	1.630	.217	.111	3.029	.300
	Huynh-Feldt	2.439	2.000	1.219	1.630	.215	.111	3.261	.313
	Lower-bound	2.439	1.000	2.439	1.630	.224	.111	1.630	.220
sdlatacc	Sphericity Assumed	3.599	2	1.800	1.268	.298	.089	2.536	.251
	Greenhouse-Geisser	3.599	1.971	1.826	1.268	.298	.089	2.499	.249
	Huynh-Feldt	3.599	2.000	1.800	1.268	.298	.089	2.536	.251
	Lower-bound	3.599	1.000	3.599	1.268	.280	.089	1.268	.181
sdlatpos	Sphericity Assumed	1.880	2	.940	2.149	.137	.142	4.298	.400
	Greenhouse-Geisser	1.880	1.836	1.024	2.149	.142	.142	3.944	.381
	Huynh-Feldt	1.880	2.000	.940	2.149	.137	.142	4.298	.400
	Lower-bound	1.880	1.000	1.880	2.149	.166	.142	2.149	.274
sdaccthr	Sphericity Assumed	.278	2	.139	.465	.633	.035	.930	.118
	Greenhouse-	.278	1.959	.142	.465	.629	.035	.911	.117

		Geisser								
		Huynh-Feldt	.278	2.000	.139	.465	.633	.035	.930	.118
		Lower-bound	.278	1.000	.278	.465	.507	.035	.465	.097
state * NDfC * NGEFT	lon_acc	Sphericity Assumed	3.272	2	1.636	2.474	.104	.160	4.949	.452
		Greenhouse-Geisser	3.272	1.718	1.905	2.474	.113	.160	4.251	.415
		Huynh-Feldt	3.272	2.000	1.636	2.474	.104	.160	4.949	.452
		Lower-bound	3.272	1.000	3.272	2.474	.140	.160	2.474	.308
	lat_acc	Sphericity Assumed	15.577	2	7.788	5.047	.014	.280	10.095	.770
		Greenhouse-Geisser	15.577	1.955	7.968	5.047	.015	.280	9.867	.762
		Huynh-Feldt	15.577	2.000	7.788	5.047	.014	.280	10.095	.770
		Lower-bound	15.577	1.000	15.577	5.047	.043	.280	5.047	.548
	lon_vel	Sphericity Assumed	84.910	2	42.455	2.729	.084	.174	5.459	.492
		Greenhouse-Geisser	84.910	1.574	53.956	2.729	.099	.174	4.295	.429
		Huynh-Feldt	84.910	2.000	42.455	2.729	.084	.174	5.459	.492
		Lower-bound	84.910	1.000	84.910	2.729	.122	.174	2.729	.334
	lat_vel	Sphericity Assumed	.117	2	.058	.878	.428	.063	1.756	.184
		Greenhouse-Geisser	.117	1.864	.063	.878	.422	.063	1.636	.179
		Huynh-Feldt	.117	2.000	.058	.878	.428	.063	1.756	.184
		Lower-bound	.117	1.000	.117	.878	.366	.063	.878	.140
	lat_pos	Sphericity Assumed	.218	2	.109	.559	.578	.041	1.118	.133
		Greenhouse-Geisser	.218	1.494	.146	.559	.531	.041	.835	.120
		Huynh-Feldt	.218	2.000	.109	.559	.578	.041	1.118	.133
		Lower-bound	.218	1.000	.218	.559	.468	.041	.559	.107
	veh_curv	Sphericity Assumed	6.221E-07	2	3.111E-07	2.051	.149	.136	4.103	.384
		Greenhouse-Geisser	6.221E-07	1.721	3.615E-07	2.051	.157	.136	3.531	.352
		Huynh-Feldt	6.221E-07	2.000	3.111E-07	2.051	.149	.136	4.103	.384
		Lower-bound	6.221E-07	1.000	6.221E-07	2.051	.176	.136	2.051	.264
	raod_cur	Sphericity Assumed	1.885E-07	2	9.425E-08	.864	.433	.062	1.727	.182
		Greenhouse-Geisser	1.885E-07	1.817	1.037E-07	.864	.425	.062	1.569	.175
		Huynh-Feldt	1.885E-07	2.000	9.425E-08	.864	.433	.062	1.727	.182
		Lower-bound	1.885E-07	1.000	1.885E-07	.864	.370	.062	.864	.139
	head_err	Sphericity Assumed	2.271E-05	2	1.135E-05	.853	.438	.062	1.705	.180
		Greenhouse-Geisser	2.271E-05	1.702	1.335E-05	.853	.423	.062	1.451	.168
		Huynh-Feldt	2.271E-05	2.000	1.135E-05	.853	.438	.062	1.705	.180
		Lower-bound	2.271E-05	1.000	2.271E-05	.853	.373	.062	.853	.137
	steer_an	Sphericity Assumed	344.269	2	172.134	4.113	.028	.240	8.225	.676

		Greenhouse-Geisser	344.269	1.720	200.155	4.113	.035	.240	7.074	.626
		Huynh-Feldt	344.269	2.000	172.134	4.113	.028	.240	8.225	.676
		Lower-bound	344.269	1.000	344.269	4.113	.064	.240	4.113	.467
	acc_thr	Sphericity Assumed	1.366	2	.683	2.654	.089	.170	5.308	.480
		Greenhouse-Geisser	1.366	1.363	1.003	2.654	.113	.170	3.616	.386
		Huynh-Feldt	1.366	2.000	.683	2.654	.089	.170	5.308	.480
		Lower-bound	1.366	1.000	1.366	2.654	.127	.170	2.654	.326
	acc_brk	Sphericity Assumed	.198	2	.099	.631	.540	.046	1.262	.144
		Greenhouse-Geisser	.198	1.225	.161	.631	.470	.046	.773	.122
		Huynh-Feldt	.198	1.911	.104	.631	.534	.046	1.206	.142
		Lower-bound	.198	1.000	.198	.631	.441	.046	.631	.114
	min_ttc	Sphericity Assumed	93.667	2	46.833	1.965	.160	.131	3.929	.369
		Greenhouse-Geisser	93.667	1.657	56.534	1.965	.170	.131	3.255	.332
		Huynh-Feldt	93.667	2.000	46.833	1.965	.160	.131	3.929	.369
		Lower-bound	93.667	1.000	93.667	1.965	.184	.131	1.965	.255
	sdlonacc	Sphericity Assumed	2.803	2	1.402	1.874	.174	.126	3.748	.354
		Greenhouse-Geisser	2.803	1.858	1.509	1.874	.177	.126	3.481	.339
		Huynh-Feldt	2.803	2.000	1.402	1.874	.174	.126	3.748	.354
		Lower-bound	2.803	1.000	2.803	1.874	.194	.126	1.874	.245
	sdlatacc	Sphericity Assumed	15.615	2	7.807	5.501	.010	.297	11.003	.806
		Greenhouse-Geisser	15.615	1.971	7.923	5.501	.011	.297	10.843	.802
		Huynh-Feldt	15.615	2.000	7.807	5.501	.010	.297	11.003	.806
		Lower-bound	15.615	1.000	15.615	5.501	.036	.297	5.501	.583
	sdlatpos	Sphericity Assumed	1.097	2	.549	1.254	.302	.088	2.508	.248
		Greenhouse-Geisser	1.097	1.836	.598	1.254	.301	.088	2.302	.238
		Huynh-Feldt	1.097	2.000	.549	1.254	.302	.088	2.508	.248
		Lower-bound	1.097	1.000	1.097	1.254	.283	.088	1.254	.180
	sdaccthr	Sphericity Assumed	.443	2	.221	.742	.486	.054	1.484	.162
		Greenhouse-Geisser	.443	1.959	.226	.742	.484	.054	1.454	.161
		Huynh-Feldt	.443	2.000	.221	.742	.486	.054	1.484	.162
		Lower-bound	.443	1.000	.443	.742	.405	.054	.742	.126
state * NDfC * NOpSpan	lon_acc	Sphericity Assumed	3.077	2	1.539	2.327	.118	.152	4.654	.429
		Greenhouse-Geisser	3.077	1.718	1.791	2.327	.127	.152	3.997	.393
		Huynh-Feldt	3.077	2.000	1.539	2.327	.118	.152	4.654	.429
		Lower-bound	3.077	1.000	3.077	2.327	.151	.152	2.327	.293
	lat_acc	Sphericity Assumed	6.538	2	3.269	2.119	.140	.140	4.237	.395
		Greenhouse-Geisser	6.538	1.955	3.345	2.119	.142	.140	4.141	.390

	Huynh-Feldt	6.538	2.000	3.269	2.119	.140	.140	4.237	.395
	Lower-bound	6.538	1.000	6.538	2.119	.169	.140	2.119	.271
lon_vel	Sphericity Assumed	9.244	2	4.622	.297	.745	.022	.594	.092
	Greenhouse-Geisser	9.244	1.574	5.874	.297	.694	.022	.468	.087
	Huynh-Feldt	9.244	2.000	4.622	.297	.745	.022	.594	.092
	Lower-bound	9.244	1.000	9.244	.297	.595	.022	.297	.080
lat_vel	Sphericity Assumed	.263	2	.132	1.979	.158	.132	3.958	.372
	Greenhouse-Geisser	.263	1.864	.141	1.979	.162	.132	3.688	.357
	Huynh-Feldt	.263	2.000	.132	1.979	.158	.132	3.958	.372
	Lower-bound	.263	1.000	.263	1.979	.183	.132	1.979	.256
lat_pos	Sphericity Assumed	.085	2	.042	.217	.806	.016	.435	.080
	Greenhouse-Geisser	.085	1.494	.057	.217	.742	.016	.325	.076
	Huynh-Feldt	.085	2.000	.042	.217	.806	.016	.435	.080
	Lower-bound	.085	1.000	.085	.217	.649	.016	.217	.072
veh_curv	Sphericity Assumed	8.841E-07	2	4.420E-07	2.915	.072	.183	5.830	.520
	Greenhouse-Geisser	8.841E-07	1.721	5.136E-07	2.915	.082	.183	5.017	.477
	Huynh-Feldt	8.841E-07	2.000	4.420E-07	2.915	.072	.183	5.830	.520
	Lower-bound	8.841E-07	1.000	8.841E-07	2.915	.112	.183	2.915	.353
raod_cur	Sphericity Assumed	6.456E-07	2	3.228E-07	2.958	.070	.185	5.916	.526
	Greenhouse-Geisser	6.456E-07	1.817	3.553E-07	2.958	.076	.185	5.375	.498
	Huynh-Feldt	6.456E-07	2.000	3.228E-07	2.958	.070	.185	5.916	.526
	Lower-bound	6.456E-07	1.000	6.456E-07	2.958	.109	.185	2.958	.357
head_err	Sphericity Assumed	9.430E-05	2	4.715E-05	3.541	.044	.214	7.081	.607
	Greenhouse-Geisser	9.430E-05	1.702	5.542E-05	3.541	.053	.214	6.024	.556
	Huynh-Feldt	9.430E-05	2.000	4.715E-05	3.541	.044	.214	7.081	.607
	Lower-bound	9.430E-05	1.000	9.430E-05	3.541	.082	.214	3.541	.414
steer_an	Sphericity Assumed	228.591	2	114.295	2.731	.084	.174	5.461	.492
	Greenhouse-Geisser	228.591	1.720	132.900	2.731	.094	.174	4.697	.451
	Huynh-Feldt	228.591	2.000	114.295	2.731	.084	.174	5.461	.492
	Lower-bound	228.591	1.000	228.591	2.731	.122	.174	2.731	.334
acc_thr	Sphericity Assumed	.301	2	.150	.584	.565	.043	1.168	.136
	Greenhouse-Geisser	.301	1.363	.221	.584	.505	.043	.796	.120
	Huynh-Feldt	.301	2.000	.150	.584	.565	.043	1.168	.136
	Lower-bound	.301	1.000	.301	.584	.458	.043	.584	.109
acc_brk	Sphericity Assumed	.624	2	.312	1.989	.157	.133	3.978	.373
	Greenhouse-Geisser	.624	1.225	.509	1.989	.177	.133	2.437	.285
	Huynh-Feldt	.624	1.911	.326	1.989	.160	.133	3.802	.364
	Lower-bound	.624	1.000	.624	1.989	.182	.133	1.989	.258

	min_ttc	Sphericity Assumed	92.972	2	46.486	1.950	.163	.130	3.900	.367
		Greenhouse-Geisser	92.972	1.657	56.115	1.950	.171	.130	3.231	.330
		Huynh-Feldt	92.972	2.000	46.486	1.950	.163	.130	3.900	.367
		Lower-bound	92.972	1.000	92.972	1.950	.186	.130	1.950	.253
	sdlonacc	Sphericity Assumed	3.031	2	1.516	2.027	.152	.135	4.053	.379
		Greenhouse-Geisser	3.031	1.858	1.632	2.027	.156	.135	3.764	.364
		Huynh-Feldt	3.031	2.000	1.516	2.027	.152	.135	4.053	.379
		Lower-bound	3.031	1.000	3.031	2.027	.178	.135	2.027	.261
	sdlatacc	Sphericity Assumed	6.426	2	3.213	2.264	.124	.148	4.528	.418
		Greenhouse-Geisser	6.426	1.971	3.260	2.264	.125	.148	4.462	.415
		Huynh-Feldt	6.426	2.000	3.213	2.264	.124	.148	4.528	.418
		Lower-bound	6.426	1.000	6.426	2.264	.156	.148	2.264	.286
	sdlatpos	Sphericity Assumed	.073	2	.036	.083	.920	.006	.166	.061
		Greenhouse-Geisser	.073	1.836	.040	.083	.907	.006	.153	.061
		Huynh-Feldt	.073	2.000	.036	.083	.920	.006	.166	.061
		Lower-bound	.073	1.000	.073	.083	.778	.006	.083	.058
	sdaccthr	Sphericity Assumed	.324	2	.162	.544	.587	.040	1.088	.130
		Greenhouse-Geisser	.324	1.959	.166	.544	.584	.040	1.066	.129
		Huynh-Feldt	.324	2.000	.162	.544	.587	.040	1.088	.130
		Lower-bound	.324	1.000	.324	.544	.474	.040	.544	.105
state * NGEFT * NOpSpan	lon_acc	Sphericity Assumed	4.163	2	2.081	3.148	.060	.195	6.296	.553
		Greenhouse-Geisser	4.163	1.718	2.423	3.148	.069	.195	5.408	.508
		Huynh-Feldt	4.163	2.000	2.081	3.148	.060	.195	6.296	.553
		Lower-bound	4.163	1.000	4.163	3.148	.099	.195	3.148	.376
	lat_acc	Sphericity Assumed	8.932	2	4.466	2.894	.073	.182	5.789	.517
		Greenhouse-Geisser	8.932	1.955	4.569	2.894	.075	.182	5.658	.510
		Huynh-Feldt	8.932	2.000	4.466	2.894	.073	.182	5.789	.517
		Lower-bound	8.932	1.000	8.932	2.894	.113	.182	2.894	.351
	lon_vel	Sphericity Assumed	13.995	2	6.997	.450	.643	.033	.900	.115
		Greenhouse-Geisser	13.995	1.574	8.893	.450	.598	.033	.708	.107
		Huynh-Feldt	13.995	2.000	6.997	.450	.643	.033	.900	.115
		Lower-bound	13.995	1.000	13.995	.450	.514	.033	.450	.095
	lat_vel	Sphericity Assumed	.021	2	.010	.155	.857	.012	.310	.071
		Greenhouse-Geisser	.021	1.864	.011	.155	.843	.012	.289	.071
		Huynh-Feldt	.021	2.000	.010	.155	.857	.012	.310	.071
		Lower-bound	.021	1.000	.021	.155	.700	.012	.155	.065
	lat_pos	Sphericity Assumed	.193	2	.097	.495	.615	.037	.991	.122

	Greenhouse-Geisser	.193	1.494	.129	.495	.563	.037	.740	.112
	Huynh-Feldt	.193	2.000	.097	.495	.615	.037	.991	.122
	Lower-bound	.193	1.000	.193	.495	.494	.037	.495	.100
veh_curv	Sphericity Assumed	5.481E-07	2	2.740E-07	1.807	.184	.122	3.614	.343
	Greenhouse-Geisser	5.481E-07	1.721	3.184E-07	1.807	.190	.122	3.111	.315
	Huynh-Feldt	5.481E-07	2.000	2.740E-07	1.807	.184	.122	3.614	.343
	Lower-bound	5.481E-07	1.000	5.481E-07	1.807	.202	.122	1.807	.238
raod_cur	Sphericity Assumed	3.031E-07	2	1.515E-07	1.389	.267	.097	2.777	.271
	Greenhouse-Geisser	3.031E-07	1.817	1.668E-07	1.389	.268	.097	2.523	.258
	Huynh-Feldt	3.031E-07	2.000	1.515E-07	1.389	.267	.097	2.777	.271
	Lower-bound	3.031E-07	1.000	3.031E-07	1.389	.260	.097	1.389	.194
head_err	Sphericity Assumed	1.652E-05	2	8.261E-06	.620	.546	.046	1.241	.142
	Greenhouse-Geisser	1.652E-05	1.702	9.710E-06	.620	.522	.046	1.056	.134
	Huynh-Feldt	1.652E-05	2.000	8.261E-06	.620	.546	.046	1.241	.142
	Lower-bound	1.652E-05	1.000	1.652E-05	.620	.445	.046	.620	.113
steer_an	Sphericity Assumed	228.054	2	114.027	2.724	.084	.173	5.449	.491
	Greenhouse-Geisser	228.054	1.720	132.589	2.724	.094	.173	4.686	.451
	Huynh-Feldt	228.054	2.000	114.027	2.724	.084	.173	5.449	.491
	Lower-bound	228.054	1.000	228.054	2.724	.123	.173	2.724	.334
acc_thr	Sphericity Assumed	1.672	2	.836	3.249	.055	.200	6.498	.567
	Greenhouse-Geisser	1.672	1.363	1.227	3.249	.078	.200	4.427	.458
	Huynh-Feldt	1.672	2.000	.836	3.249	.055	.200	6.498	.567
	Lower-bound	1.672	1.000	1.672	3.249	.095	.200	3.249	.386
acc_brk	Sphericity Assumed	.271	2	.135	.862	.434	.062	1.725	.182
	Greenhouse-Geisser	.271	1.225	.221	.862	.389	.062	1.057	.149
	Huynh-Feldt	.271	1.911	.142	.862	.430	.062	1.648	.178
	Lower-bound	.271	1.000	.271	.862	.370	.062	.862	.138
min_ttc	Sphericity Assumed	165.345	2	82.672	3.468	.046	.211	6.936	.597
	Greenhouse-Geisser	165.345	1.657	99.797	3.468	.057	.211	5.746	.539
	Huynh-Feldt	165.345	2.000	82.672	3.468	.046	.211	6.936	.597
	Lower-bound	165.345	1.000	165.345	3.468	.085	.211	3.468	.407
sdlonacc	Sphericity Assumed	4.062	2	2.031	2.716	.085	.173	5.432	.490
	Greenhouse-Geisser	4.062	1.858	2.187	2.716	.090	.173	5.045	.470
	Huynh-Feldt	4.062	2.000	2.031	2.716	.085	.173	5.432	.490
	Lower-bound	4.062	1.000	4.062	2.716	.123	.173	2.716	.333
sdlatacc	Sphericity Assumed	8.801	2	4.401	3.101	.062	.193	6.202	.547
	Greenhouse-Geisser	8.801	1.971	4.466	3.101	.063	.193	6.112	.542

		Huynh-Feldt	8.801	2.000	4.401	3.101	.062	.193	6.202	.547
		Lower-bound	8.801	1.000	8.801	3.101	.102	.193	3.101	.371
	sdlatpos	Sphericity Assumed	.406	2	.203	.464	.634	.034	.928	.118
		Greenhouse-Geisser	.406	1.836	.221	.464	.618	.034	.852	.114
		Huynh-Feldt	.406	2.000	.203	.464	.634	.034	.928	.118
		Lower-bound	.406	1.000	.406	.464	.508	.034	.464	.097
	sdaccthr	Sphericity Assumed	1.020	2	.510	1.709	.201	.116	3.419	.326
		Greenhouse-Geisser	1.020	1.959	.521	1.709	.201	.116	3.350	.322
		Huynh-Feldt	1.020	2.000	.510	1.709	.201	.116	3.419	.326
		Lower-bound	1.020	1.000	1.020	1.709	.214	.116	1.709	.228
Error(state)	lon_acc	Sphericity Assumed	17.190	26	.661					
		Greenhouse-Geisser	17.190	22.331	.770					
		Huynh-Feldt	17.190	26.000	.661					
		Lower-bound	17.190	13.000	1.322					
	lat_acc	Sphericity Assumed	40.120	26	1.543					
		Greenhouse-Geisser	40.120	25.413	1.579					
		Huynh-Feldt	40.120	26.000	1.543					
		Lower-bound	40.120	13.000	3.086					
	lon_vel	Sphericity Assumed	404.413	26	15.554					
		Greenhouse-Geisser	404.413	20.458	19.768					
		Huynh-Feldt	404.413	26.000	15.554					
		Lower-bound	404.413	13.000	31.109					
	lat_vel	Sphericity Assumed	1.730	26	.067					
		Greenhouse-Geisser	1.730	24.227	.071					
		Huynh-Feldt	1.730	26.000	.067					
		Lower-bound	1.730	13.000	.133					
	lat_pos	Sphericity Assumed	5.074	26	.195					
		Greenhouse-Geisser	5.074	19.418	.261					
		Huynh-Feldt	5.074	26.000	.195					
		Lower-bound	5.074	13.000	.390					
	veh_curv	Sphericity Assumed	3.943E-06	26	1.516E-07					
		Greenhouse-Geisser	3.943E-06	22.376	1.762E-07					
		Huynh-Feldt	3.943E-06	26.000	1.516E-07					
		Lower-bound	3.943E-06	13.000	3.033E-07					
	raod_cur	Sphericity Assumed	2.837E-06	26	1.091E-07					
		Greenhouse-Geisser	2.837E-06	23.623	1.201E-07					
		Huynh-Feldt	2.837E-06	26.000	1.091E-07					
		Lower-bound	2.837E-06	13.000	2.183E-07					
	head_err	Sphericity	.000	26	1.332					

		Assumed			E-05					
		Greenhouse-Geisser	.000	22.120	1.565E-05					
		Huynh-Feldt	.000	26.000	1.332E-05					
		Lower-bound	.000	13.000	2.663E-05					
	steer_an	Sphericity Assumed	1088.237	26	41.855					
		Greenhouse-Geisser	1088.237	22.360	48.668					
		Huynh-Feldt	1088.237	26.000	41.855					
		Lower-bound	1088.237	13.000	83.711					
	acc_thr	Sphericity Assumed	6.692	26	.257					
		Greenhouse-Geisser	6.692	17.713	.378					
		Huynh-Feldt	6.692	26.000	.257					
		Lower-bound	6.692	13.000	.515					
	acc_brk	Sphericity Assumed	4.078	26	.157					
		Greenhouse-Geisser	4.078	15.930	.256					
		Huynh-Feldt	4.078	24.849	.164					
		Lower-bound	4.078	13.000	.314					
	min_ttc	Sphericity Assumed	619.795	26	23.838					
		Greenhouse-Geisser	619.795	21.539	28.776					
		Huynh-Feldt	619.795	26.000	23.838					
		Lower-bound	619.795	13.000	47.677					
	sdlonacc	Sphericity Assumed	19.444	26	.748					
		Greenhouse-Geisser	19.444	24.148	.805					
		Huynh-Feldt	19.444	26.000	.748					
		Lower-bound	19.444	13.000	1.496					
	sdlatacc	Sphericity Assumed	36.898	26	1.419					
		Greenhouse-Geisser	36.898	25.621	1.440					
		Huynh-Feldt	36.898	26.000	1.419					
		Lower-bound	36.898	13.000	2.838					
	sdlatpos	Sphericity Assumed	11.375	26	.437					
		Greenhouse-Geisser	11.375	23.862	.477					
		Huynh-Feldt	11.375	26.000	.437					
		Lower-bound	11.375	13.000	.875					
	sdaccthr	Sphericity Assumed	7.757	26	.298					
		Greenhouse-Geisser	7.757	25.473	.305					
		Huynh-Feldt	7.757	26.000	.298					
		Lower-bound	7.757	13.000	.597					
type * state	lon_acc	Sphericity Assumed	2.557	4	.639	.802	.530	.058	3.206	.239
		Greenhouse-Geisser	2.557	2.534	1.009	.802	.483	.058	2.031	.191

	Huynh-Feldt	2.557	4.000	.639	.802	.530	.058	3.206	.239
	Lower-bound	2.557	1.000	2.557	.802	.387	.058	.802	.132
lat_acc	Sphericity Assumed	8.122	4	2.030	1.523	.209	.105	6.091	.439
	Greenhouse-Geisser	8.122	2.733	2.972	1.523	.228	.105	4.161	.350
	Huynh-Feldt	8.122	4.000	2.030	1.523	.209	.105	6.091	.439
	Lower-bound	8.122	1.000	8.122	1.523	.239	.105	1.523	.208
lon_vel	Sphericity Assumed	137.575	4	34.394	2.103	.094	.139	8.410	.585
	Greenhouse-Geisser	137.575	2.875	47.860	2.103	.119	.139	6.044	.484
	Huynh-Feldt	137.575	4.000	34.394	2.103	.094	.139	8.410	.585
	Lower-bound	137.575	1.000	137.575	2.103	.171	.139	2.103	.269
lat_vel	Sphericity Assumed	.430	4	.108	1.389	.251	.097	5.556	.402
	Greenhouse-Geisser	.430	3.364	.128	1.389	.257	.097	4.672	.363
	Huynh-Feldt	.430	4.000	.108	1.389	.251	.097	5.556	.402
	Lower-bound	.430	1.000	.430	1.389	.260	.097	1.389	.194
lat_pos	Sphericity Assumed	.315	4	.079	.402	.806	.030	1.609	.136
	Greenhouse-Geisser	.315	2.608	.121	.402	.725	.030	1.049	.117
	Huynh-Feldt	.315	4.000	.079	.402	.806	.030	1.609	.136
	Lower-bound	.315	1.000	.315	.402	.537	.030	.402	.091
veh_curv	Sphericity Assumed	5.376E-07	4	1.344E-07	.391	.814	.029	1.565	.133
	Greenhouse-Geisser	5.376E-07	2.835	1.896E-07	.391	.749	.029	1.109	.118
	Huynh-Feldt	5.376E-07	4.000	1.344E-07	.391	.814	.029	1.565	.133
	Lower-bound	5.376E-07	1.000	5.376E-07	.391	.543	.029	.391	.089
raod_cur	Sphericity Assumed	4.495E-07	4	1.124E-07	1.019	.406	.073	4.075	.299
	Greenhouse-Geisser	4.495E-07	2.483	1.810E-07	1.019	.386	.073	2.530	.231
	Huynh-Feldt	4.495E-07	4.000	1.124E-07	1.019	.406	.073	4.075	.299
	Lower-bound	4.495E-07	1.000	4.495E-07	1.019	.331	.073	1.019	.155
head_err	Sphericity Assumed	.000	4	3.260E-05	1.832	.137	.123	7.326	.519
	Greenhouse-Geisser	.000	3.397	3.838E-05	1.832	.149	.123	6.222	.472
	Huynh-Feldt	.000	4.000	3.260E-05	1.832	.137	.123	7.326	.519
	Lower-bound	.000	1.000	.000	1.832	.199	.123	1.832	.241
steer_an	Sphericity Assumed	223.627	4	55.907	1.035	.398	.074	4.142	.304
	Greenhouse-Geisser	223.627	2.787	80.253	1.035	.385	.074	2.885	.249
	Huynh-Feldt	223.627	4.000	55.907	1.035	.398	.074	4.142	.304
	Lower-bound	223.627	1.000	223.627	1.035	.327	.074	1.035	.157
acc_thr	Sphericity Assumed	1.742	4	.436	1.593	.190	.109	6.370	.457
	Greenhouse-Geisser	1.742	2.710	.643	1.593	.212	.109	4.316	.363
	Huynh-Feldt	1.742	4.000	.436	1.593	.190	.109	6.370	.457
	Lower-bound	1.742	1.000	1.742	1.593	.229	.109	1.593	.216

	acc_brk	Sphericity Assumed	.749	4	.187	.576	.681	.042	2.304	.179
		Greenhouse-Geisser	.749	2.095	.358	.576	.577	.042	1.207	.137
		Huynh-Feldt	.749	3.659	.205	.576	.667	.042	2.108	.172
		Lower-bound	.749	1.000	.749	.576	.461	.042	.576	.108
	min_ttc	Sphericity Assumed	212.984	4	53.246	2.377	.064	.155	9.509	.646
		Greenhouse-Geisser	212.984	2.655	80.216	2.377	.093	.155	6.312	.514
		Huynh-Feldt	212.984	4.000	53.246	2.377	.064	.155	9.509	.646
		Lower-bound	212.984	1.000	212.984	2.377	.147	.155	2.377	.298
	sdlonacc	Sphericity Assumed	2.386	4	.596	.600	.664	.044	2.399	.185
		Greenhouse-Geisser	2.386	2.388	.999	.600	.584	.044	1.432	.149
		Huynh-Feldt	2.386	4.000	.596	.600	.664	.044	2.399	.185
		Lower-bound	2.386	1.000	2.386	.600	.453	.044	.600	.111
	sdlatacc	Sphericity Assumed	7.712	4	1.928	1.624	.182	.111	6.496	.466
		Greenhouse-Geisser	7.712	2.715	2.840	1.624	.204	.111	4.410	.370
		Huynh-Feldt	7.712	4.000	1.928	1.624	.182	.111	6.496	.466
		Lower-bound	7.712	1.000	7.712	1.624	.225	.111	1.624	.219
	sdlatpos	Sphericity Assumed	1.619	4	.405	1.069	.381	.076	4.276	.313
		Greenhouse-Geisser	1.619	3.164	.512	1.069	.375	.076	3.382	.275
		Huynh-Feldt	1.619	4.000	.405	1.069	.381	.076	4.276	.313
		Lower-bound	1.619	1.000	1.619	1.069	.320	.076	1.069	.160
	sdaccthr	Sphericity Assumed	.242	4	.060	.354	.840	.027	1.417	.124
		Greenhouse-Geisser	.242	3.197	.076	.354	.799	.027	1.132	.115
		Huynh-Feldt	.242	4.000	.060	.354	.840	.027	1.417	.124
		Lower-bound	.242	1.000	.242	.354	.562	.027	.354	.086
type * state * NDfC	lon_acc	Sphericity Assumed	.683	4	.171	.214	.929	.016	.857	.092
		Greenhouse-Geisser	.683	2.534	.270	.214	.856	.016	.543	.084
		Huynh-Feldt	.683	4.000	.171	.214	.929	.016	.857	.092
		Lower-bound	.683	1.000	.683	.214	.651	.016	.214	.071
	lat_acc	Sphericity Assumed	8.116	4	2.029	1.522	.209	.105	6.087	.438
		Greenhouse-Geisser	8.116	2.733	2.970	1.522	.228	.105	4.158	.350
		Huynh-Feldt	8.116	4.000	2.029	1.522	.209	.105	6.087	.438
		Lower-bound	8.116	1.000	8.116	1.522	.239	.105	1.522	.208
	lon_vel	Sphericity Assumed	171.651	4	42.913	2.623	.045	.168	10.493	.695
		Greenhouse-Geisser	171.651	2.875	59.714	2.623	.067	.168	7.541	.584
		Huynh-Feldt	171.651	4.000	42.913	2.623	.045	.168	10.493	.695
		Lower-bound	171.651	1.000	171.651	2.623	.129	.168	2.623	.323
	lat_vel	Sphericity Assumed	.247	4	.062	.798	.532	.058	3.192	.238
		Greenhouse-Geisser	.247	3.364	.073	.798	.514	.058	2.684	.218

	Huynh-Feldt	.247	4.000	.062	.798	.532	.058	3.192	.238
	Lower-bound	.247	1.000	.247	.798	.388	.058	.798	.132
lat_pos	Sphericity Assumed	.906	4	.226	1.157	.340	.082	4.630	.338
	Greenhouse-Geisser	.906	2.608	.347	1.157	.336	.082	3.019	.266
	Huynh-Feldt	.906	4.000	.226	1.157	.340	.082	4.630	.338
	Lower-bound	.906	1.000	.906	1.157	.302	.082	1.157	.170
veh_curv	Sphericity Assumed	2.494E-07	4	6.236E-08	.181	.947	.014	.726	.085
	Greenhouse-Geisser	2.494E-07	2.835	8.799E-08	.181	.899	.014	.514	.080
	Huynh-Feldt	2.494E-07	4.000	6.236E-08	.181	.947	.014	.726	.085
	Lower-bound	2.494E-07	1.000	2.494E-07	.181	.677	.014	.181	.068
raod_cur	Sphericity Assumed	7.586E-07	4	1.897E-07	1.719	.160	.117	6.877	.490
	Greenhouse-Geisser	7.586E-07	2.483	3.055E-07	1.719	.189	.117	4.269	.371
	Huynh-Feldt	7.586E-07	4.000	1.897E-07	1.719	.160	.117	6.877	.490
	Lower-bound	7.586E-07	1.000	7.586E-07	1.719	.212	.117	1.719	.229
head_err	Sphericity Assumed	5.622E-05	4	1.406E-05	.790	.537	.057	3.159	.236
	Greenhouse-Geisser	5.622E-05	3.397	1.655E-05	.790	.520	.057	2.683	.217
	Huynh-Feldt	5.622E-05	4.000	1.406E-05	.790	.537	.057	3.159	.236
	Lower-bound	5.622E-05	1.000	5.622E-05	.790	.390	.057	.790	.131
steer_an	Sphericity Assumed	154.728	4	38.682	.716	.585	.052	2.866	.216
	Greenhouse-Geisser	154.728	2.787	55.527	.716	.539	.052	1.996	.182
	Huynh-Feldt	154.728	4.000	38.682	.716	.585	.052	2.866	.216
	Lower-bound	154.728	1.000	154.728	.716	.413	.052	.716	.123
acc_thr	Sphericity Assumed	2.265	4	.566	2.070	.098	.137	8.281	.577
	Greenhouse-Geisser	2.265	2.710	.836	2.070	.127	.137	5.611	.461
	Huynh-Feldt	2.265	4.000	.566	2.070	.098	.137	8.281	.577
	Lower-bound	2.265	1.000	2.265	2.070	.174	.137	2.070	.266
acc_brk	Sphericity Assumed	.260	4	.065	.200	.937	.015	.798	.089
	Greenhouse-Geisser	.260	2.095	.124	.200	.830	.015	.418	.078
	Huynh-Feldt	.260	3.659	.071	.200	.926	.015	.730	.088
	Lower-bound	.260	1.000	.260	.200	.662	.015	.200	.070
min_ttc	Sphericity Assumed	149.924	4	37.481	1.673	.170	.114	6.693	.479
	Greenhouse-Geisser	149.924	2.655	56.465	1.673	.195	.114	4.443	.376
	Huynh-Feldt	149.924	4.000	37.481	1.673	.170	.114	6.693	.479
	Lower-bound	149.924	1.000	149.924	1.673	.218	.114	1.673	.224
sdlonacc	Sphericity Assumed	.655	4	.164	.165	.955	.013	.659	.082
	Greenhouse-Geisser	.655	2.388	.274	.165	.882	.013	.394	.075
	Huynh-Feldt	.655	4.000	.164	.165	.955	.013	.659	.082

		Lower-bound	.655	1.000	.655	.165	.691	.013	.165	.066
	sdlatacc	Sphericity Assumed	6.511	4	1.628	1.371	.257	.095	5.485	.397
		Greenhouse-Geisser	6.511	2.715	2.398	1.371	.268	.095	3.723	.317
		Huynh-Feldt	6.511	4.000	1.628	1.371	.257	.095	5.485	.397
		Lower-bound	6.511	1.000	6.511	1.371	.263	.095	1.371	.192
	sdlatpos	Sphericity Assumed	1.445	4	.361	.954	.441	.068	3.814	.281
		Greenhouse-Geisser	1.445	3.164	.457	.954	.427	.068	3.017	.247
		Huynh-Feldt	1.445	4.000	.361	.954	.441	.068	3.814	.281
		Lower-bound	1.445	1.000	1.445	.954	.347	.068	.954	.148
	sdaccthr	Sphericity Assumed	.058	4	.014	.085	.987	.006	.339	.066
		Greenhouse-Geisser	.058	3.197	.018	.085	.973	.006	.271	.064
		Huynh-Feldt	.058	4.000	.014	.085	.987	.006	.339	.066
		Lower-bound	.058	1.000	.058	.085	.775	.006	.085	.058
type * state * NGEFT	lon_acc	Sphericity Assumed	7.424	4	1.856	2.327	.068	.152	9.309	.635
		Greenhouse-Geisser	7.424	2.534	2.930	2.327	.102	.152	5.896	.492
		Huynh-Feldt	7.424	4.000	1.856	2.327	.068	.152	9.309	.635
		Lower-bound	7.424	1.000	7.424	2.327	.151	.152	2.327	.293
	lat_acc	Sphericity Assumed	3.125	4	.781	.586	.674	.043	2.344	.182
		Greenhouse-Geisser	3.125	2.733	1.144	.586	.613	.043	1.601	.154
		Huynh-Feldt	3.125	4.000	.781	.586	.674	.043	2.344	.182
		Lower-bound	3.125	1.000	3.125	.586	.458	.043	.586	.110
	lon_vel	Sphericity Assumed	133.478	4	33.370	2.040	.102	.136	8.160	.570
		Greenhouse-Geisser	133.478	2.875	46.435	2.040	.127	.136	5.864	.471
		Huynh-Feldt	133.478	4.000	33.370	2.040	.102	.136	8.160	.570
		Lower-bound	133.478	1.000	133.478	2.040	.177	.136	2.040	.263
	lat_vel	Sphericity Assumed	.283	4	.071	.913	.464	.066	3.651	.270
		Greenhouse-Geisser	.283	3.364	.084	.913	.452	.066	3.070	.246
		Huynh-Feldt	.283	4.000	.071	.913	.464	.066	3.651	.270
		Lower-bound	.283	1.000	.283	.913	.357	.066	.913	.144
	lat_pos	Sphericity Assumed	.304	4	.076	.388	.816	.029	1.553	.132
		Greenhouse-Geisser	.304	2.608	.116	.388	.735	.029	1.012	.114
		Huynh-Feldt	.304	4.000	.076	.388	.816	.029	1.553	.132
		Lower-bound	.304	1.000	.304	.388	.544	.029	.388	.089
	veh_curv	Sphericity Assumed	1.188E-06	4	2.969E-07	.864	.492	.062	3.457	.256
		Greenhouse-Geisser	1.188E-06	2.835	4.190E-07	.864	.463	.062	2.450	.214
		Huynh-Feldt	1.188E-06	4.000	2.969E-07	.864	.492	.062	3.457	.256
		Lower-bound	1.188E-06	1.000	1.188E-06	.864	.369	.062	.864	.139
	raod_cur	Sphericity Assumed	8.290E-07	4	2.073E-07	1.879	.128	.126	7.515	.531

	Greenhouse-Geisser	8.290E-07	2.483	3.339E-07	1.879	.161	.126	4.665	.402
	Huynh-Feldt	8.290E-07	4.000	2.073E-07	1.879	.128	.126	7.515	.531
	Lower-bound	8.290E-07	1.000	8.290E-07	1.879	.194	.126	1.879	.246
head_err	Sphericity Assumed	4.843E-05	4	1.211E-05	.680	.609	.050	2.721	.206
	Greenhouse-Geisser	4.843E-05	3.397	1.426E-05	.680	.586	.050	2.311	.191
	Huynh-Feldt	4.843E-05	4.000	1.211E-05	.680	.609	.050	2.721	.206
	Lower-bound	4.843E-05	1.000	4.843E-05	.680	.424	.050	.680	.119
steer_an	Sphericity Assumed	145.375	4	36.344	.673	.614	.049	2.692	.204
	Greenhouse-Geisser	145.375	2.787	52.171	.673	.564	.049	1.876	.173
	Huynh-Feldt	145.375	4.000	36.344	.673	.614	.049	2.692	.204
	Lower-bound	145.375	1.000	145.375	.673	.427	.049	.673	.119
acc_thr	Sphericity Assumed	.634	4	.158	.580	.679	.043	2.318	.180
	Greenhouse-Geisser	.634	2.710	.234	.580	.616	.043	1.571	.152
	Huynh-Feldt	.634	4.000	.158	.580	.679	.043	2.318	.180
	Lower-bound	.634	1.000	.634	.580	.460	.043	.580	.109
acc_brk	Sphericity Assumed	2.612	4	.653	2.008	.107	.134	8.031	.563
	Greenhouse-Geisser	2.612	2.095	1.247	2.008	.152	.134	4.207	.386
	Huynh-Feldt	2.612	3.659	.714	2.008	.114	.134	7.347	.535
	Lower-bound	2.612	1.000	2.612	2.008	.180	.134	2.008	.260
min_ttc	Sphericity Assumed	102.760	4	25.690	1.147	.345	.081	4.588	.335
	Greenhouse-Geisser	102.760	2.655	38.702	1.147	.340	.081	3.045	.266
	Huynh-Feldt	102.760	4.000	25.690	1.147	.345	.081	4.588	.335
	Lower-bound	102.760	1.000	102.760	1.147	.304	.081	1.147	.168
sdlonacc	Sphericity Assumed	9.903	4	2.476	2.490	.054	.161	9.959	.669
	Greenhouse-Geisser	9.903	2.388	4.147	2.490	.091	.161	5.945	.503
	Huynh-Feldt	9.903	4.000	2.476	2.490	.054	.161	9.959	.669
	Lower-bound	9.903	1.000	9.903	2.490	.139	.161	2.490	.310
sdlatacc	Sphericity Assumed	2.366	4	.592	.498	.737	.037	1.993	.159
	Greenhouse-Geisser	2.366	2.715	.872	.498	.668	.037	1.353	.137
	Huynh-Feldt	2.366	4.000	.592	.498	.737	.037	1.993	.159
	Lower-bound	2.366	1.000	2.366	.498	.493	.037	.498	.100
sdlatpos	Sphericity Assumed	1.186	4	.296	.783	.542	.057	3.131	.234
	Greenhouse-Geisser	1.186	3.164	.375	.783	.516	.057	2.476	.208
	Huynh-Feldt	1.186	4.000	.296	.783	.542	.057	3.131	.234
	Lower-bound	1.186	1.000	1.186	.783	.392	.057	.783	.130
sdaccthr	Sphericity Assumed	.371	4	.093	.543	.705	.040	2.173	.171
	Greenhouse-Geisser	.371	3.197	.116	.543	.666	.040	1.736	.155
	Huynh-Feldt	.371	4.000	.093	.543	.705	.040	2.173	.171

		Lower-bound	.371	1.000	.371	.543	.474	.040	.543	.105
type * state * NOpSpan	lon_acc	Sphericity Assumed	4.800	4	1.200	1.505	.214	.104	6.019	.434
		Greenhouse-Geisser	4.800	2.534	1.895	1.505	.235	.104	3.812	.332
		Huynh-Feldt	4.800	4.000	1.200	1.505	.214	.104	6.019	.434
		Lower-bound	4.800	1.000	4.800	1.505	.242	.104	1.505	.206
	lat_acc	Sphericity Assumed	9.626	4	2.406	1.805	.142	.122	7.219	.512
		Greenhouse-Geisser	9.626	2.733	3.523	1.805	.168	.122	4.932	.410
		Huynh-Feldt	9.626	4.000	2.406	1.805	.142	.122	7.219	.512
		Lower-bound	9.626	1.000	9.626	1.805	.202	.122	1.805	.238
	lon_vel	Sphericity Assumed	25.825	4	6.456	.395	.812	.029	1.579	.134
		Greenhouse-Geisser	25.825	2.875	8.984	.395	.749	.029	1.135	.119
		Huynh-Feldt	25.825	4.000	6.456	.395	.812	.029	1.579	.134
		Lower-bound	25.825	1.000	25.825	.395	.541	.029	.395	.090
	lat_vel	Sphericity Assumed	.423	4	.106	1.365	.259	.095	5.458	.395
		Greenhouse-Geisser	.423	3.364	.126	1.365	.265	.095	4.590	.357
		Huynh-Feldt	.423	4.000	.106	1.365	.259	.095	5.458	.395
		Lower-bound	.423	1.000	.423	1.365	.264	.095	1.365	.191
	lat_pos	Sphericity Assumed	.825	4	.206	1.055	.388	.075	4.219	.309
		Greenhouse-Geisser	.825	2.608	.316	1.055	.374	.075	2.751	.245
		Huynh-Feldt	.825	4.000	.206	1.055	.388	.075	4.219	.309
		Lower-bound	.825	1.000	.825	1.055	.323	.075	1.055	.159
	veh_curv	Sphericity Assumed	4.183E-07	4	1.046E-07	.304	.874	.023	1.218	.113
		Greenhouse-Geisser	4.183E-07	2.835	1.476E-07	.304	.811	.023	.863	.102
		Huynh-Feldt	4.183E-07	4.000	1.046E-07	.304	.874	.023	1.218	.113
		Lower-bound	4.183E-07	1.000	4.183E-07	.304	.591	.023	.304	.081
	raod_cur	Sphericity Assumed	2.631E-07	4	6.578E-08	.596	.667	.044	2.385	.184
		Greenhouse-Geisser	2.631E-07	2.483	1.060E-07	.596	.592	.044	1.481	.150
		Huynh-Feldt	2.631E-07	4.000	6.578E-08	.596	.667	.044	2.385	.184
		Lower-bound	2.631E-07	1.000	2.631E-07	.596	.454	.044	.596	.111
	head_err	Sphericity Assumed	.000	4	2.875E-05	1.616	.184	.111	6.463	.463
		Greenhouse-Geisser	.000	3.397	3.386E-05	1.616	.194	.111	5.489	.421
		Huynh-Feldt	.000	4.000	2.875E-05	1.616	.184	.111	6.463	.463
		Lower-bound	.000	1.000	.000	1.616	.226	.111	1.616	.218
	steer_an	Sphericity Assumed	141.385	4	35.346	.655	.626	.048	2.618	.200
		Greenhouse-Geisser	141.385	2.787	50.739	.655	.574	.048	1.824	.169
		Huynh-Feldt	141.385	4.000	35.346	.655	.626	.048	2.618	.200
		Lower-bound	141.385	1.000	141.385	.655	.433	.048	.655	.117

	acc_thr	Sphericity Assumed	.239	4	.060	.218	.927	.017	.873	.093
		Greenhouse-Geisser	.239	2.710	.088	.218	.865	.017	.591	.085
		Huynh-Feldt	.239	4.000	.060	.218	.927	.017	.873	.093
		Lower-bound	.239	1.000	.239	.218	.648	.017	.218	.072
	acc_brk	Sphericity Assumed	1.340	4	.335	1.030	.401	.073	4.120	.302
		Greenhouse-Geisser	1.340	2.095	.640	1.030	.374	.073	2.158	.215
		Huynh-Feldt	1.340	3.659	.366	1.030	.398	.073	3.769	.287
		Lower-bound	1.340	1.000	1.340	1.030	.329	.073	1.030	.156
	min_ttc	Sphericity Assumed	117.021	4	29.255	1.306	.280	.091	5.224	.379
		Greenhouse-Geisser	117.021	2.655	44.073	1.306	.288	.091	3.468	.299
		Huynh-Feldt	117.021	4.000	29.255	1.306	.280	.091	5.224	.379
		Lower-bound	117.021	1.000	117.021	1.306	.274	.091	1.306	.185
	sdlonacc	Sphericity Assumed	5.952	4	1.488	1.496	.217	.103	5.986	.431
		Greenhouse-Geisser	5.952	2.388	2.493	1.496	.238	.103	3.573	.319
		Huynh-Feldt	5.952	4.000	1.488	1.496	.217	.103	5.986	.431
		Lower-bound	5.952	1.000	5.952	1.496	.243	.103	1.496	.205
	sdlatacc	Sphericity Assumed	7.319	4	1.830	1.541	.204	.106	6.165	.443
		Greenhouse-Geisser	7.319	2.715	2.696	1.541	.223	.106	4.185	.353
		Huynh-Feldt	7.319	4.000	1.830	1.541	.204	.106	6.165	.443
		Lower-bound	7.319	1.000	7.319	1.541	.236	.106	1.541	.210
	sdlatpos	Sphericity Assumed	1.762	4	.440	1.163	.338	.082	4.652	.339
		Greenhouse-Geisser	1.762	3.164	.557	1.163	.337	.082	3.679	.297
		Huynh-Feldt	1.762	4.000	.440	1.163	.338	.082	4.652	.339
		Lower-bound	1.762	1.000	1.762	1.163	.300	.082	1.163	.170
	sdaccthr	Sphericity Assumed	.406	4	.102	.595	.668	.044	2.381	.184
		Greenhouse-Geisser	.406	3.197	.127	.595	.632	.044	1.903	.166
		Huynh-Feldt	.406	4.000	.102	.595	.668	.044	2.381	.184
		Lower-bound	.406	1.000	.406	.595	.454	.044	.595	.110
type * state * NDfC * NGEFT	lon_acc	Sphericity Assumed	3.251	4	.813	1.019	.406	.073	4.076	.299
		Greenhouse-Geisser	3.251	2.534	1.283	1.019	.387	.073	2.582	.234
		Huynh-Feldt	3.251	4.000	.813	1.019	.406	.073	4.076	.299
		Lower-bound	3.251	1.000	3.251	1.019	.331	.073	1.019	.155
	lat_acc	Sphericity Assumed	5.182	4	1.295	.971	.431	.070	3.886	.286
		Greenhouse-Geisser	5.182	2.733	1.896	.971	.411	.070	2.655	.233
		Huynh-Feldt	5.182	4.000	1.295	.971	.431	.070	3.886	.286
		Lower-bound	5.182	1.000	5.182	.971	.342	.070	.971	.150
	lon_vel	Sphericity Assumed	90.914	4	22.728	1.389	.250	.097	5.558	.402

	Greenhouse-Geisser	90.914	2.875	31.627	1.389	.261	.097	3.994	.332
	Huynh-Feldt	90.914	4.000	22.728	1.389	.250	.097	5.558	.402
	Lower-bound	90.914	1.000	90.914	1.389	.260	.097	1.389	.194
lat_vel	Sphericity Assumed	.307	4	.077	.993	.420	.071	3.970	.292
	Greenhouse-Geisser	.307	3.364	.091	.993	.412	.071	3.339	.265
	Huynh-Feldt	.307	4.000	.077	.993	.420	.071	3.970	.292
	Lower-bound	.307	1.000	.307	.993	.337	.071	.993	.152
lat_pos	Sphericity Assumed	.902	4	.225	1.152	.343	.081	4.608	.336
	Greenhouse-Geisser	.902	2.608	.346	1.152	.338	.081	3.005	.265
	Huynh-Feldt	.902	4.000	.225	1.152	.343	.081	4.608	.336
	Lower-bound	.902	1.000	.902	1.152	.303	.081	1.152	.169
veh_curv	Sphericity Assumed	9.641E-07	4	2.410E-07	.702	.594	.051	2.806	.212
	Greenhouse-Geisser	9.641E-07	2.835	3.401E-07	.702	.550	.051	1.989	.180
	Huynh-Feldt	9.641E-07	4.000	2.410E-07	.702	.594	.051	2.806	.212
	Lower-bound	9.641E-07	1.000	9.641E-07	.702	.417	.051	.702	.122
raod_cur	Sphericity Assumed	6.246E-07	4	1.562E-07	1.416	.242	.098	5.663	.409
	Greenhouse-Geisser	6.246E-07	2.483	2.516E-07	1.416	.258	.098	3.515	.310
	Huynh-Feldt	6.246E-07	4.000	1.562E-07	1.416	.242	.098	5.663	.409
	Lower-bound	6.246E-07	1.000	6.246E-07	1.416	.255	.098	1.416	.197
head_err	Sphericity Assumed	6.317E-05	4	1.579E-05	.887	.478	.064	3.550	.263
	Greenhouse-Geisser	6.317E-05	3.397	1.860E-05	.887	.466	.064	3.014	.241
	Huynh-Feldt	6.317E-05	4.000	1.579E-05	.887	.478	.064	3.550	.263
	Lower-bound	6.317E-05	1.000	6.317E-05	.887	.363	.064	.887	.141
steer_an	Sphericity Assumed	190.102	4	47.525	.880	.482	.063	3.521	.261
	Greenhouse-Geisser	190.102	2.787	68.222	.880	.454	.063	2.453	.216
	Huynh-Feldt	190.102	4.000	47.525	.880	.482	.063	3.521	.261
	Lower-bound	190.102	1.000	190.102	.880	.365	.063	.880	.140
acc_thr	Sphericity Assumed	.390	4	.097	.357	.838	.027	1.426	.125
	Greenhouse-Geisser	.390	2.710	.144	.357	.765	.027	.966	.110
	Huynh-Feldt	.390	4.000	.097	.357	.838	.027	1.426	.125
	Lower-bound	.390	1.000	.390	.357	.561	.027	.357	.086
acc_brk	Sphericity Assumed	1.664	4	.416	1.279	.290	.090	5.116	.372
	Greenhouse-Geisser	1.664	2.095	.794	1.279	.296	.090	2.680	.259
	Huynh-Feldt	1.664	3.659	.455	1.279	.292	.090	4.680	.353
	Lower-bound	1.664	1.000	1.664	1.279	.279	.090	1.279	.182
min_ttc	Sphericity Assumed	116.254	4	29.063	1.298	.283	.091	5.190	.377
	Greenhouse-Geisser	116.254	2.655	43.784	1.298	.290	.091	3.445	.298

		Huynh-Feldt	116.254	4.000	29.063	1.298	.283	.091	5.190	.377
		Lower-bound	116.254	1.000	116.254	1.298	.275	.091	1.298	.184
	sdlonacc	Sphericity Assumed	5.044	4	1.261	1.268	.294	.089	5.072	.369
		Greenhouse-Geisser	5.044	2.388	2.112	1.268	.299	.089	3.028	.275
		Huynh-Feldt	5.044	4.000	1.261	1.268	.294	.089	5.072	.369
		Lower-bound	5.044	1.000	5.044	1.268	.280	.089	1.268	.181
	sdlatacc	Sphericity Assumed	4.466	4	1.116	.941	.448	.067	3.762	.277
		Greenhouse-Geisser	4.466	2.715	1.645	.941	.424	.067	2.554	.226
		Huynh-Feldt	4.466	4.000	1.116	.941	.448	.067	3.762	.277
		Lower-bound	4.466	1.000	4.466	.941	.350	.067	.941	.147
	sdlatpos	Sphericity Assumed	1.312	4	.328	.866	.491	.062	3.464	.257
		Greenhouse-Geisser	1.312	3.164	.415	.866	.471	.062	2.739	.227
		Huynh-Feldt	1.312	4.000	.328	.866	.491	.062	3.464	.257
		Lower-bound	1.312	1.000	1.312	.866	.369	.062	.866	.139
	sdaccthr	Sphericity Assumed	.102	4	.026	.149	.962	.011	.598	.079
		Greenhouse-Geisser	.102	3.197	.032	.149	.938	.011	.478	.076
		Huynh-Feldt	.102	4.000	.026	.149	.962	.011	.598	.079
		Lower-bound	.102	1.000	.102	.149	.705	.011	.149	.065
type * state * NDfC * NOpSpan	lon_acc	Sphericity Assumed	.591	4	.148	.185	.945	.014	.740	.086
		Greenhouse-Geisser	.591	2.534	.233	.185	.878	.014	.469	.079
		Huynh-Feldt	.591	4.000	.148	.185	.945	.014	.740	.086
		Lower-bound	.591	1.000	.591	.185	.674	.014	.185	.068
	lat_acc	Sphericity Assumed	5.634	4	1.409	1.056	.387	.075	4.225	.310
		Greenhouse-Geisser	5.634	2.733	2.062	1.056	.375	.075	2.887	.251
		Huynh-Feldt	5.634	4.000	1.409	1.056	.387	.075	4.225	.310
		Lower-bound	5.634	1.000	5.634	1.056	.323	.075	1.056	.159
	lon_vel	Sphericity Assumed	53.807	4	13.452	.822	.517	.059	3.289	.245
		Greenhouse-Geisser	53.807	2.875	18.718	.822	.485	.059	2.364	.207
		Huynh-Feldt	53.807	4.000	13.452	.822	.517	.059	3.289	.245
		Lower-bound	53.807	1.000	53.807	.822	.381	.059	.822	.134
	lat_vel	Sphericity Assumed	.444	4	.111	1.434	.236	.099	5.736	.414
		Greenhouse-Geisser	.444	3.364	.132	1.434	.243	.099	4.824	.374
		Huynh-Feldt	.444	4.000	.111	1.434	.236	.099	5.736	.414
		Lower-bound	.444	1.000	.444	1.434	.252	.099	1.434	.199
	lat_pos	Sphericity Assumed	.169	4	.042	.215	.929	.016	.861	.093
		Greenhouse-Geisser	.169	2.608	.065	.215	.860	.016	.562	.084
		Huynh-Feldt	.169	4.000	.042	.215	.929	.016	.861	.093

	Lower-bound	.169	1.000	.169	.215	.650	.016	.215	.072
veh_curv	Sphericity Assumed	1.799E-07	4	4.497E-08	.131	.970	.010	.524	.075
	Greenhouse-Geisser	1.799E-07	2.835	6.345E-08	.131	.934	.010	.371	.071
	Huynh-Feldt	1.799E-07	4.000	4.497E-08	.131	.970	.010	.524	.075
	Lower-bound	1.799E-07	1.000	1.799E-07	.131	.723	.010	.131	.063
raod_cur	Sphericity Assumed	2.676E-08	4	6.690E-09	.061	.993	.005	.243	.061
	Greenhouse-Geisser	2.676E-08	2.483	1.078E-08	.061	.965	.005	.151	.059
	Huynh-Feldt	2.676E-08	4.000	6.690E-09	.061	.993	.005	.243	.061
	Lower-bound	2.676E-08	1.000	2.676E-08	.061	.809	.005	.061	.056
head_err	Sphericity Assumed	9.700E-05	4	2.425E-05	1.363	.260	.095	5.451	.395
	Greenhouse-Geisser	9.700E-05	3.397	2.855E-05	1.363	.265	.095	4.629	.359
	Huynh-Feldt	9.700E-05	4.000	2.425E-05	1.363	.260	.095	5.451	.395
	Lower-bound	9.700E-05	1.000	9.700E-05	1.363	.264	.095	1.363	.191
steer_an	Sphericity Assumed	52.833	4	13.208	.245	.912	.018	.978	.099
	Greenhouse-Geisser	52.833	2.787	18.960	.245	.851	.018	.682	.091
	Huynh-Feldt	52.833	4.000	13.208	.245	.912	.018	.978	.099
	Lower-bound	52.833	1.000	52.833	.245	.629	.018	.245	.074
acc_thr	Sphericity Assumed	1.144	4	.286	1.046	.393	.074	4.182	.307
	Greenhouse-Geisser	1.144	2.710	.422	1.046	.379	.074	2.834	.248
	Huynh-Feldt	1.144	4.000	.286	1.046	.393	.074	4.182	.307
	Lower-bound	1.144	1.000	1.144	1.046	.325	.074	1.046	.158
acc_brk	Sphericity Assumed	.441	4	.110	.339	.851	.025	1.355	.120
	Greenhouse-Geisser	.441	2.095	.210	.339	.725	.025	.710	.100
	Huynh-Feldt	.441	3.659	.120	.339	.835	.025	1.239	.117
	Lower-bound	.441	1.000	.441	.339	.571	.025	.339	.084
min_ttc	Sphericity Assumed	64.484	4	16.121	.720	.582	.052	2.879	.217
	Greenhouse-Geisser	64.484	2.655	24.286	.720	.531	.052	1.911	.179
	Huynh-Feldt	64.484	4.000	16.121	.720	.582	.052	2.879	.217
	Lower-bound	64.484	1.000	64.484	.720	.412	.052	.720	.123
sdlonacc	Sphericity Assumed	.653	4	.163	.164	.956	.012	.657	.082
	Greenhouse-Geisser	.653	2.388	.274	.164	.883	.012	.392	.075
	Huynh-Feldt	.653	4.000	.163	.164	.956	.012	.657	.082
	Lower-bound	.653	1.000	.653	.164	.692	.012	.164	.066
sdlatacc	Sphericity Assumed	5.578	4	1.394	1.175	.333	.083	4.699	.343
	Greenhouse-Geisser	5.578	2.715	2.054	1.175	.331	.083	3.189	.275
	Huynh-Feldt	5.578	4.000	1.394	1.175	.333	.083	4.699	.343
	Lower-bound	5.578	1.000	5.578	1.175	.298	.083	1.175	.171

	sdlatpos	Sphericity Assumed	.050	4	.013	.033	.998	.003	.132	.056
		Greenhouse-Geisser	.050	3.164	.016	.033	.993	.003	.105	.055
		Huynh-Feldt	.050	4.000	.013	.033	.998	.003	.132	.056
		Lower-bound	.050	1.000	.050	.033	.859	.003	.033	.053
	sdaccthr	Sphericity Assumed	.110	4	.028	.162	.957	.012	.647	.081
		Greenhouse-Geisser	.110	3.197	.035	.162	.930	.012	.517	.078
		Huynh-Feldt	.110	4.000	.028	.162	.957	.012	.647	.081
		Lower-bound	.110	1.000	.110	.162	.694	.012	.162	.066
type * state * NGEFT * NOpSpan	lon_acc	Sphericity Assumed	1.863	4	.466	.584	.676	.043	2.336	.181
		Greenhouse-Geisser	1.863	2.534	.735	.584	.602	.043	1.480	.149
		Huynh-Feldt	1.863	4.000	.466	.584	.676	.043	2.336	.181
		Lower-bound	1.863	1.000	1.863	.584	.458	.043	.584	.109
	lat_acc	Sphericity Assumed	6.918	4	1.730	1.297	.283	.091	5.188	.377
		Greenhouse-Geisser	6.918	2.733	2.532	1.297	.290	.091	3.544	.302
		Huynh-Feldt	6.918	4.000	1.730	1.297	.283	.091	5.188	.377
		Lower-bound	6.918	1.000	6.918	1.297	.275	.091	1.297	.184
	lon_vel	Sphericity Assumed	49.920	4	12.480	.763	.554	.055	3.052	.229
		Greenhouse-Geisser	49.920	2.875	17.366	.763	.517	.055	2.193	.194
		Huynh-Feldt	49.920	4.000	12.480	.763	.554	.055	3.052	.229
		Lower-bound	49.920	1.000	49.920	.763	.398	.055	.763	.128
	lat_vel	Sphericity Assumed	.573	4	.143	1.849	.134	.125	7.396	.524
		Greenhouse-Geisser	.573	3.364	.170	1.849	.146	.125	6.219	.473
		Huynh-Feldt	.573	4.000	.143	1.849	.134	.125	7.396	.524
		Lower-bound	.573	1.000	.573	1.849	.197	.125	1.849	.243
	lat_pos	Sphericity Assumed	.167	4	.042	.213	.930	.016	.852	.092
		Greenhouse-Geisser	.167	2.608	.064	.213	.862	.016	.556	.084
		Huynh-Feldt	.167	4.000	.042	.213	.930	.016	.852	.092
		Lower-bound	.167	1.000	.167	.213	.652	.016	.213	.071
	veh_curv	Sphericity Assumed	1.580E-07	4	3.949E-08	.115	.977	.009	.460	.072
		Greenhouse-Geisser	1.580E-07	2.835	5.572E-08	.115	.944	.009	.326	.069
		Huynh-Feldt	1.580E-07	4.000	3.949E-08	.115	.977	.009	.460	.072
		Lower-bound	1.580E-07	1.000	1.580E-07	.115	.740	.009	.115	.061
	raod_cur	Sphericity Assumed	1.506E-07	4	3.764E-08	.341	.849	.026	1.365	.121
		Greenhouse-Geisser	1.506E-07	2.483	6.064E-08	.341	.758	.026	.847	.105
		Huynh-Feldt	1.506E-07	4.000	3.764E-08	.341	.849	.026	1.365	.121
		Lower-bound	1.506E-07	1.000	1.506E-07	.341	.569	.026	.341	.084

	head_err	Sphericity Assumed	8.712E-05	4	2.178E-05	1.224	.312	.086	4.895	.356
		Greenhouse-Geisser	8.712E-05	3.397	2.565E-05	1.224	.314	.086	4.157	.324
		Huynh-Feldt	8.712E-05	4.000	2.178E-05	1.224	.312	.086	4.895	.356
		Lower-bound	8.712E-05	1.000	8.712E-05	1.224	.289	.086	1.224	.177
	steer_an	Sphericity Assumed	94.860	4	23.715	.439	.780	.033	1.757	.145
		Greenhouse-Geisser	94.860	2.787	34.043	.439	.712	.033	1.224	.127
		Huynh-Feldt	94.860	4.000	23.715	.439	.780	.033	1.757	.145
		Lower-bound	94.860	1.000	94.860	.439	.519	.033	.439	.094
	acc_thr	Sphericity Assumed	.492	4	.123	.450	.772	.033	1.801	.147
		Greenhouse-Geisser	.492	2.710	.182	.450	.700	.033	1.220	.127
		Huynh-Feldt	.492	4.000	.123	.450	.772	.033	1.801	.147
		Lower-bound	.492	1.000	.492	.450	.514	.033	.450	.095
	acc_brk	Sphericity Assumed	1.083	4	.271	.832	.511	.060	3.329	.247
		Greenhouse-Geisser	1.083	2.095	.517	.832	.451	.060	1.744	.181
		Huynh-Feldt	1.083	3.659	.296	.832	.503	.060	3.046	.236
		Lower-bound	1.083	1.000	1.083	.832	.378	.060	.832	.135
	min_ttc	Sphericity Assumed	93.743	4	23.436	1.046	.392	.074	4.185	.307
		Greenhouse-Geisser	93.743	2.655	35.306	1.046	.378	.074	2.778	.245
		Huynh-Feldt	93.743	4.000	23.436	1.046	.392	.074	4.185	.307
		Lower-bound	93.743	1.000	93.743	1.046	.325	.074	1.046	.158
	sdlonacc	Sphericity Assumed	3.326	4	.831	.836	.508	.060	3.345	.249
		Greenhouse-Geisser	3.326	2.388	1.393	.836	.461	.060	1.997	.192
		Huynh-Feldt	3.326	4.000	.831	.836	.508	.060	3.345	.249
		Lower-bound	3.326	1.000	3.326	.836	.377	.060	.836	.136
	sdlatacc	Sphericity Assumed	6.458	4	1.614	1.360	.261	.095	5.440	.394
		Greenhouse-Geisser	6.458	2.715	2.378	1.360	.271	.095	3.692	.315
		Huynh-Feldt	6.458	4.000	1.614	1.360	.261	.095	5.440	.394
		Lower-bound	6.458	1.000	6.458	1.360	.264	.095	1.360	.191
	sdlatpos	Sphericity Assumed	.894	4	.224	.590	.671	.043	2.362	.183
		Greenhouse-Geisser	.894	3.164	.283	.590	.633	.043	1.868	.165
		Huynh-Feldt	.894	4.000	.224	.590	.671	.043	2.362	.183
		Lower-bound	.894	1.000	.894	.590	.456	.043	.590	.110
	sdaccthr	Sphericity Assumed	.055	4	.014	.080	.988	.006	.320	.065
		Greenhouse-Geisser	.055	3.197	.017	.080	.975	.006	.256	.063
		Huynh-Feldt	.055	4.000	.014	.080	.988	.006	.320	.065
		Lower-bound	.055	1.000	.055	.080	.782	.006	.080	.058
Error(type*state)	lon_acc	Sphericity Assumed	41.474	52	.798					
		Greenhouse-	41.474	32.937	1.259					

	Geisser								
	Huynh-Feldt	41.474	52.000	.798					
	Lower-bound	41.474	13.000	3.190					
lat_acc	Sphericity Assumed	69.337	52	1.333					
	Greenhouse-Geisser	69.337	35.523	1.952					
	Huynh-Feldt	69.337	52.000	1.333					
	Lower-bound	69.337	13.000	5.334					
lon_vel	Sphericity Assumed	850.620	52	16.358					
	Greenhouse-Geisser	850.620	37.369	22.763					
	Huynh-Feldt	850.620	52.000	16.358					
	Lower-bound	850.620	13.000	65.432					
lat_vel	Sphericity Assumed	4.027	52	.077					
	Greenhouse-Geisser	4.027	43.728	.092					
	Huynh-Feldt	4.027	52.000	.077					
	Lower-bound	4.027	13.000	.310					
lat_pos	Sphericity Assumed	10.175	52	.196					
	Greenhouse-Geisser	10.175	33.906	.300					
	Huynh-Feldt	10.175	52.000	.196					
	Lower-bound	10.175	13.000	.783					
veh_curv	Sphericity Assumed	1.787E-05	52	3.436E-07					
	Greenhouse-Geisser	1.787E-05	36.852	4.848E-07					
	Huynh-Feldt	1.787E-05	52.000	3.436E-07					
	Lower-bound	1.787E-05	13.000	1.374E-06					
raod_cur	Sphericity Assumed	5.736E-06	52	1.103E-07					
	Greenhouse-Geisser	5.736E-06	32.279	1.777E-07					
	Huynh-Feldt	5.736E-06	52.000	1.103E-07					
	Lower-bound	5.736E-06	13.000	4.412E-07					
head_err	Sphericity Assumed	.001	52	1.780E-05					
	Greenhouse-Geisser	.001	44.161	2.096E-05					
	Huynh-Feldt	.001	52.000	1.780E-05					
	Lower-bound	.001	13.000	7.119E-05					
steer_an	Sphericity Assumed	2807.785	52	53.996					
	Greenhouse-Geisser	2807.785	36.225	77.510					
	Huynh-Feldt	2807.785	52.000	53.996					
	Lower-bound	2807.785	13.000	215.983					
acc_thr	Sphericity Assumed	14.221	52	.273					
	Greenhouse-Geisser	14.221	35.234	.404					

		Huynh-Feldt	14.221	52.000	.273					
		Lower-bound	14.221	13.000	1.094					
	acc_brk	Sphericity Assumed	16.912	52	.325					
		Greenhouse-Geisser	16.912	27.237	.621					
		Huynh-Feldt	16.912	47.570	.356					
		Lower-bound	16.912	13.000	1.301					
	min_ttc	Sphericity Assumed	1164.745	52	22.399					
		Greenhouse-Geisser	1164.745	34.517	33.744					
		Huynh-Feldt	1164.745	52.000	22.399					
		Lower-bound	1164.745	13.000	89.596					
	sdlonacc	Sphericity Assumed	51.707	52	.994					
		Greenhouse-Geisser	51.707	31.043	1.666					
		Huynh-Feldt	51.707	52.000	.994					
		Lower-bound	51.707	13.000	3.977					
	sdlatacc	Sphericity Assumed	61.729	52	1.187					
		Greenhouse-Geisser	61.729	35.296	1.749					
		Huynh-Feldt	61.729	52.000	1.187					
		Lower-bound	61.729	13.000	4.748					
	sdlatpos	Sphericity Assumed	19.692	52	.379					
		Greenhouse-Geisser	19.692	41.127	.479					
		Huynh-Feldt	19.692	52.000	.379					
		Lower-bound	19.692	13.000	1.515					
	sdaccthr	Sphericity Assumed	8.877	52	.171					
		Greenhouse-Geisser	8.877	41.556	.214					
		Huynh-Feldt	8.877	52.000	.171					
		Lower-bound	8.877	13.000	.683					

a Computed using alpha = .05

Repeated Measures Type and State – Between Subjects Effects

Tests of Between-Subjects Effects

Transformed Variable: Average

Source	Measure	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power(a)
Intercept	lon_acc	1604.583	1	1604.583	229.958	.000	.946	229.958	1.000
	lat_acc	472.751	1	472.751	42.601	.000	.766	42.601	1.000
	lon_vel	299716.928	1	299716.928	513.273	.000	.975	513.273	1.000
	lat_vel	86.916	1	86.916	105.063	.000	.890	105.063	1.000
	lat_pos	1496.077	1	1496.077	692.059	.000	.982	692.059	1.000
	veh_curv	5.016E-05	1	5.016E-05	67.762	.000	.839	67.762	1.000

	raod_cur	3.218E-05	1	3.218E-05	89.777	.000	.874	89.777	1.000
	head_err	.022	1	.022	201.362	.000	.939	201.362	1.000
	steer_an	17511.872	1	17511.872	64.369	.000	.832	64.369	1.000
	acc_thr	1575.791	1	1575.791	885.963	.000	.986	885.963	1.000
	acc_brk	10.598	1	10.598	9.488	.009	.422	9.488	.812
	min_ttc	11118.369	1	11118.369	28.204	.000	.684	28.204	.998
	sdlonacc	1497.481	1	1497.481	199.332	.000	.939	199.332	1.000
	sdlatacc	451.462	1	451.462	41.394	.000	.761	41.394	1.000
	sdlatpos	1175.758	1	1175.758	295.314	.000	.958	295.314	1.000
	sdaccthr	1098.717	1	1098.717	538.077	.000	.976	538.077	1.000
NDfC	lon_acc	5.855	1	5.855	.839	.376	.061	.839	.136
	lat_acc	19.311	1	19.311	1.740	.210	.118	1.740	.231
	lon_vel	24.981	1	24.981	.043	.839	.003	.043	.054
	lat_vel	.149	1	.149	.180	.678	.014	.180	.068
	lat_pos	13.558	1	13.558	6.272	.026	.325	6.272	.639
	veh_curv	2.698E-06	1	2.698E-06	3.645	.079	.219	3.645	.424
	raod_cur	2.401E-06	1	2.401E-06	6.698	.023	.340	6.698	.668
	head_err	5.391E-05	1	5.391E-05	.499	.492	.037	.499	.101
	steer_an	832.478	1	832.478	3.060	.104	.191	3.060	.367
	acc_thr	3.780	1	3.780	2.125	.169	.141	2.125	.272
	acc_brk	.002	1	.002	.002	.965	.000	.002	.050
	min_ttc	2.194	1	2.194	.006	.942	.000	.006	.051
	sdlonacc	7.908	1	7.908	1.053	.324	.075	1.053	.158
	sdlatacc	17.177	1	17.177	1.575	.232	.108	1.575	.214
	sdlatpos	6.594	1	6.594	1.656	.221	.113	1.656	.222
	sdaccthr	6.297	1	6.297	3.084	.103	.192	3.084	.370
NGEFT	lon_acc	.988	1	.988	.142	.713	.011	.142	.064
	lat_acc	2.503	1	2.503	.226	.643	.017	.226	.073
	lon_vel	191.582	1	191.582	.328	.577	.025	.328	.083
	lat_vel	.330	1	.330	.398	.539	.030	.398	.090
	lat_pos	21.917	1	21.917	10.138	.007	.438	10.138	.837
	veh_curv	6.818E-07	1	6.818E-07	.921	.355	.066	.921	.145
	raod_cur	1.935E-07	1	1.935E-07	.540	.476	.040	.540	.105
	head_err	.000	1	.000	.941	.350	.067	.941	.147
	steer_an	123.942	1	123.942	.456	.512	.034	.456	.096
	acc_thr	.594	1	.594	.334	.573	.025	.334	.084
	acc_brk	.052	1	.052	.046	.833	.004	.046	.055
	min_ttc	459.845	1	459.845	1.166	.300	.082	1.166	.170
	sdlonacc	.506	1	.506	.067	.799	.005	.067	.057
	sdlatacc	2.292	1	2.292	.210	.654	.016	.210	.071
	sdlatpos	4.173	1	4.173	1.048	.325	.075	1.048	.158
	sdaccthr	.710	1	.710	.348	.566	.026	.348	.085
NOpSpan	lon_acc	.320	1	.320	.046	.834	.004	.046	.055
	lat_acc	14.471	1	14.471	1.304	.274	.091	1.304	.185
	lon_vel	.103	1	.103	.000	.990	.000	.000	.050
	lat_vel	.249	1	.249	.301	.593	.023	.301	.080

	lat_pos	2.366	1	2.366	1.095	.315	.078	1.095	.163
	veh_curv	4.859E-06	1	4.859E-06	6.565	.024	.336	6.565	.659
	raod_cur	1.944E-06	1	1.944E-06	5.423	.037	.294	5.423	.577
	head_err	.000	1	.000	1.570	.232	.108	1.570	.213
	steer_an	905.653	1	905.653	3.329	.091	.204	3.329	.394
	acc_thr	.001	1	.001	.001	.982	.000	.001	.050
	acc_brk	.205	1	.205	.184	.675	.014	.184	.068
	min_ttc	28.430	1	28.430	.072	.792	.006	.072	.057
	sdlonacc	.348	1	.348	.046	.833	.004	.046	.055
	sdlatacc	13.194	1	13.194	1.210	.291	.085	1.210	.175
	sdlatpos	4.393	1	4.393	1.103	.313	.078	1.103	.164
	sdaccthr	.020	1	.020	.010	.922	.001	.010	.051
NDfC * NGEFT	lon_acc	3.590	1	3.590	.514	.486	.038	.514	.102
	lat_acc	.292	1	.292	.026	.874	.002	.026	.053
	lon_vel	114.991	1	114.991	.197	.665	.015	.197	.070
	lat_vel	.016	1	.016	.019	.892	.001	.019	.052
	lat_pos	10.167	1	10.167	4.703	.049	.266	4.703	.519
	veh_curv	6.778E-08	1	6.778E-08	.092	.767	.007	.092	.059
	raod_cur	1.500E-08	1	1.500E-08	.042	.841	.003	.042	.054
	head_err	1.912E-07	1	1.912E-07	.002	.967	.000	.002	.050
	steer_an	4.667	1	4.667	.017	.898	.001	.017	.052
	acc_thr	1.878	1	1.878	1.056	.323	.075	1.056	.159
	acc_brk	.243	1	.243	.217	.649	.016	.217	.072
	min_ttc	222.186	1	222.186	.564	.466	.042	.564	.107
	sdlonacc	2.767	1	2.767	.368	.554	.028	.368	.087
	sdlatacc	.200	1	.200	.018	.894	.001	.018	.052
	sdlatpos	8.103	1	8.103	2.035	.177	.135	2.035	.262
	sdaccthr	1.410	1	1.410	.690	.421	.050	.690	.120
NDfC * NOpSpan	lon_acc	1.469	1	1.469	.211	.654	.016	.211	.071
	lat_acc	16.206	1	16.206	1.460	.248	.101	1.460	.202
	lon_vel	204.553	1	204.553	.350	.564	.026	.350	.085
	lat_vel	.397	1	.397	.480	.501	.036	.480	.098
	lat_pos	3.320	1	3.320	1.536	.237	.106	1.536	.210
	veh_curv	2.157E-06	1	2.157E-06	2.915	.112	.183	2.915	.353
	raod_cur	1.073E-06	1	1.073E-06	2.992	.107	.187	2.992	.361
	head_err	3.437E-05	1	3.437E-05	.318	.582	.024	.318	.082
	steer_an	571.143	1	571.143	2.099	.171	.139	2.099	.269
	acc_thr	1.076	1	1.076	.605	.451	.044	.605	.111
	acc_brk	.079	1	.079	.071	.794	.005	.071	.057
	min_ttc	174.499	1	174.499	.443	.517	.033	.443	.095
	sdlonacc	1.220	1	1.220	.162	.694	.012	.162	.066
	sdlatacc	14.685	1	14.685	1.346	.267	.094	1.346	.190
	sdlatpos	10.304	1	10.304	2.588	.132	.166	2.588	.320
	sdaccthr	.168	1	.168	.082	.779	.006	.082	.058
NGEFT *	lon_acc	4.926	1	4.926	.706	.416	.052	.706	.122

NOpSpan									
	lat_acc	.066	1	.066	.006	.940	.000	.006	.051
	lon_vel	1.257	1	1.257	.002	.964	.000	.002	.050
	lat_vel	.069	1	.069	.083	.778	.006	.083	.058
	lat_pos	5.342	1	5.342	2.471	.140	.160	2.471	.308
	veh_curv	5.863E-07	1	5.863E-07	.792	.390	.057	.792	.131
	raod_cur	2.039E-07	1	2.039E-07	.569	.464	.042	.569	.108
	head_err	6.359E-05	1	6.359E-05	.589	.457	.043	.589	.110
	steer_an	57.448	1	57.448	.211	.653	.016	.211	.071
	acc_thr	.416	1	.416	.234	.637	.018	.234	.073
	acc_brk	.734	1	.734	.657	.432	.048	.657	.117
	min_ttc	323.330	1	323.330	.820	.382	.059	.820	.134
	sdlonacc	6.446	1	6.446	.858	.371	.062	.858	.138
	sdlatacc	.000	1	.000	.000	.995	.000	.000	.050
	sdlatpos	5.472	1	5.472	1.374	.262	.096	1.374	.193
	sdaccthr	1.022	1	1.022	.500	.492	.037	.500	.101
Error	lon_acc	90.710	13	6.978					
	lat_acc	144.264	13	11.097					
	lon_vel	7591.131	13	583.933					
	lat_vel	10.755	13	.827					
	lat_pos	28.103	13	2.162					
	veh_curv	9.622E-06	13	7.402E-07					
	raod_cur	4.660E-06	13	3.585E-07					
	head_err	.001	13	.000					
	steer_an	3536.734	13	272.056					
	acc_thr	23.122	13	1.779					
	acc_brk	14.520	13	1.117					
	min_ttc	5124.786	13	394.214					
	sdlonacc	97.662	13	7.512					
	sdlatacc	141.785	13	10.907					
	sdlatpos	51.758	13	3.981					
	sdaccthr	26.545	13	2.042					

a Computed using alpha = .05

Appendix O: Interruption State Effects on Driving Performance

Variable	Listening	Answering	Recovery
Lateral Acceleration (ft/s^2)	3.373931	3.403952	3.479163
Variability in Lateral Acceleration (ft/s^2)	3.365517	3.391806	3.47855
Longitudinal Velocity (ft/s)	68.92602	69.18444	70.11785

Variable	Ringing	Listening	Answering	Recovery
Lateral Acceleration (ft/s^2)	2.980949	3.373931	3.403952	3.479163

Interruption Type and State Effects on Driving Performance

Variable		Listening	Answering	Recovery
Longitudinal Velocity (ft/s)	Direct	69.761	71.110	69.352
	Phone	68.340	68.919	71.711
	Pager	67.656	68.386	67.980
Minimum Time to Collision (s)	Direct	10.589	11.524	11.067
	Phone	13.302	12.394	8.835
	Pager	12.848	11.446	11.884
Heading Error (rad)	Direct	.01989	.02044	.01842
	Phone	.01861	.01947	.01577
	Pager	.01621	.01755	.02268

On versus Off call variability in lateral acceleration for Desire for Control and Operation Span

Variable		Desire for Control	Operation Span	
			Small	Large
Variability in Lateral Acceleration (ft/s^2)	On-Call	Low	3.416	2.033
		High	3.122	3.412
	Off-Call	Low	3.190	2.881
		High	3.366	3.211

On versus Off call Minimum Time to Collision for Desire for Control and Operation Span

DfC	Operation Span	Minimum Time to Collision Off-Call	Minimum Time to Collision On-Call
Low	Small	10.0615	11.0034
	Large	9.3290	8.5699
High	Small	8.2329	13.6411
	Large	12.4708	12.9963

On versus Off call Vehicle Curvature for Desire for Control and Operation Span

DfC	Operation Span	Vehicle Curvature Off-Call	Vehicle Curvature On-Call
Low	Small	.0011	.0013
	Large	.0009	.0006
High	Small	.0011	.0012
	Large	.0011	.0012

Variability in Acceleration due to Throttle across Interruption Types for Operation Span

Operation Span	Interruption type	Acceleration Due to Throttle (ft/s^2)
Small	Direct	3.96199
	Phone	3.96601
	Pager	4.14863
Large	Direct	4.50707
	Phone	4.32452
	Pager	4.38410

Trends in Performance based on Interruption Type for Desire for Control

DfC	Interruption type	Longitudinal Acceleration (ft/s)	Acceleration due to brake (ft/s^2)	Road Curvature (rad)
Low	Direct	4.557759	-0.27832	0.000966
	Phone	4.536088	-0.20123	0.00078
	Pager	4.806533	-0.41441	0.000737
High	Direct	5.274413	-0.34992	0.000923
	Phone	5.594903	-0.5858	0.000919
	Pager	5.357766	-0.39336	0.000919

Trends in Performance based on Interruption Type for Cognitive Style

GEFT	Interruption type	Longitudinal Acceleration (ft/s^2)	Acceleration due to throttle (ft/s^2)	Road Curvature (rad)
FD	Direct	5.386178	5.182855	0.000966
	Phone	5.301047	5.131078	0.000849
	Pager	5.223994	4.892935	0.000918
FI	Direct	4.315641	4.44596	0.000909
	Phone	4.875286	4.942575	0.000862
	Pager	4.967897	4.763265	0.000736

Trends in Performance based on Interruption Type for Operation Span and Cognitive Style

Operation Span	DfC	Interruption type	Acceleration due to throttle (ft/s^2)
Small	Low	Direct	4.403747
		Phone	4.989949
		Pager	4.635679
	High	Direct	4.844774
		Phone	4.919553
		Pager	4.977663
Large	Low	Direct	4.711026
		Phone	4.625962
		Pager	4.111857
	High	Direct	5.337827
		Phone	5.257081

Pager 5.123829

Trends in Performance based on Interruption State for Desire for Control

DfC	Interruption state	Variability in Longitudinal Acceleration (ft/s^2)	Heading Error (rad)
Low	Listening	4.71900	0.018844
	Answering	4.38517	0.019036
	Recovery	4.70754	0.017518
High	Listening	5.09724	0.018018
	Answering	5.43121	0.019264
	Recovery	5.57013	0.02081

Variability in Lateral Acceleration based on Interruption State for Cognitive Style

GEFT	Interruption state	Variability in Lateral Acceleration (ft/s^2)
FD	Listening	3.23943
	Answering	3.07907
	Recovery	3.81335
FI	Listening	3.51643
	Answering	3.78701
	Recovery	3.02683

A borderline significant effect was shown in a similar direction for vehicle curvature, where the dependents had lower curvature during the listening and answering phases (F[2, 26]=3.552, p=.056). (See below.)

Trends in Performance based on Interruption State for Cognitive Style

GEFT	Interruption state	Vehicle Curvature (rad)
FD	Listening	0.001061
	Answering	0.001194
	Recovery	0.001114
FI	Listening	0.0012
	Answering	0.001364

	Recovery	0.001034

Trends in Performance based on Interruption Type and State for Cognitive Style

GEFT	Interruption type	Interruption state	Longitudinal Acceleration (ft/s^2)	Variability in Longitudinal Acceleration (ft/s^2)
FD	Direct	Listening	5.1871	5.101342
		Answering	5.6271	5.623655
		Recovery	5.1073	5.065827
	Phone	Listening	5.1077	5.084749
		Answering	5.3453	5.266352
		Recovery	5.1211	4.940598
	Pager	Listening	5.1143	5.105874
		Answering	4.8035	4.773708
		Recovery	6.0552	6.059296
FI	Direct	Listening	4.5235	4.488889
		Answering	4.1026	4.103698
		Recovery	4.3757	4.366513
	Phone	Listening	4.8306	4.702052
		Answering	4.3647	4.237811
		Recovery	5.4933	5.463649
	Pager	Listening	4.8434	4.830999
		Answering	5.011	5.003497
		Recovery	5.0786	5.011549

Trends in Performance based on Interruption State for Operation Span

Operation Span	Interruption state	Longitudinal Acceleration (ft/s^2)	Heading Error (rad)
Small	Listening	4.653817	0.019188
	Answering	4.668393	0.020715
	Recovery	5.036134	0.019003
Large	Listening	5.241264	0.018976
	Answering	5.294314	0.019134
	Recovery	5.455135	0.018445

Trends in Performance based on Interruption State for Cognitive Style and Desire for Control

GEFT	DfC	Interruption	Steering	Variability in	Longitudinal	Acceleration

		state	Angle (°)	Lateral Acceleration (ft/s^2)	Velocity (ft/s)	Due to Throttle (ft/s^2)
FD	Low	Listening	15.84411	2.255178	63.72707	4.958105
		Answering	18.50358	2.449754	66.48216	5.070574
		Recovery	24.80617	4.277587	69.01576	5.293671
	High	Listening	19.83802	3.410909	68.30655	4.997928
		Answering	20.25167	3.254964	68.92305	5.123096
		Recovery	21.08952	3.71102	68.89982	5.205156
FI	Low	Listening	19.33717	3.166227	70.7086	4.50887
		Answering	22.64466	3.884692	70.21922	4.268465
		Recovery	17.44181	2.863345	70.87841	4.640096
	High	Listening	25.18195	4.433638	70.39371	5.46891
		Answering	20.99544	3.282774	70.97028	5.686391
		Recovery	20.33845	3.494034	73.66803	5.395532

Trends in Performance based on Interruption State for Operation Span and Desire for Control

Operation Span	DfC	Interruption state	Road Curvature (rad)	Vehicle Curvature (rad)	Steering Angle (°)
Small	Low	Listening	0.00089	0.001265	19.77682
		Answering	0.000929	0.001503	23.82276
		Recovery	0.000824	0.001204	21.29709
	High	Listening	0.000899	0.00107	20.22357
		Answering	0.000927	0.001275	20.54328
		Recovery	0.001071	0.001225	21.53053
Large	Low	Listening	0.000511	0.000675	14.13366
		Answering	0.000501	0.000535	8.881514
		Recovery	0.000557	0.000592	9.954962
	High	Listening	0.000974	0.001114	21.2109
		Answering	0.000881	0.001142	20.29099
		Recovery	0.000939	0.001004	20.72982

Trends in Performance based on Interruption State for Cognitive Style and Operation Span

GEFT	Op. Span	Interruption state	Acceleration Due to Throttle (ft/s^2)	Longitudinal Acceleration (ft/s^2)	Lateral Acceleration (ft/s^2)	Steering Angle (°)	Variability in Longitudinal Acceleration (ft/s^2)	Variability in Lateral Acceleration (ft/s^2)
FD	Small	Listening	4.748176	5.066369	2.977032	18.63876	5.069414	2.965427
		Answering	5.085723	5.183837	2.676357	19.52552	5.13055	2.675862
		Recovery	5.322147	5.456715	3.823107	22.83083	5.375841	3.826781
	Large	Listening	5.185733	5.196178	3.460845	19.63774	5.153114	3.454021
		Answering	5.132506	5.380507	3.421042	20.12247	5.366134	3.393198
		Recovery	5.136438	5.435257	3.804334	20.86483	5.40643	3.80396
FI	Small	Listening	4.530693	4.174205	3.407572	21.18478	4.097013	3.40487
		Answering	4.215047	3.99782	4.56769	26.44701	3.970567	4.555901
		Recovery	4.704595	4.574276	3.272444	19.79211	4.466163	3.266925
	Large	Listening	4.994247	5.305889	3.650162	20.47481	5.277111	3.642553
		Answering	4.96191	5.140145	2.365844	15.06817	5.111171	2.354423
		Recovery	4.965391	5.48371	2.715111	16.05576	5.486254	2.717972

Trends in Performance based on Interruption Type and State for Desire for Control

DfC	Interruption type	Interruption state	Acceleration Due to Throttle (ft/s^2)
Low	Direct	Listening	4.6
		Answering	4.37
		Recovery	4.45
	Phone	Listening	4.76
		Answering	4.89
		Recovery	4.81
	Pager	Listening	4.47
		Answering	4.23
		Recovery	5.06
High	Direct	Listening	5.35
		Answering	5.15
		Recovery	5.08
	Phone	Listening	5.06
		Answering	5.15
		Recovery	5.51
	Pager	Listening	4.83
		Answering	5.32
		Recovery	5.13

Appendix P: Learning Effects

Regarding the learning effects, an alternative explanation is offered on the base of a data mapping imperfection. The driving simulator and program that controlled the interruptions were not directly wired as to allow exact benchmarking of events. Consequently, the timing of last interruptions as outputted by the interruption programmed where slightly mismatched with the driving simulation output, effectively describing that participants were experiencing interruptions after they were finished driving. As the investigator present during the experimental sessions, this is assured as not the case. The discrepancy was on average between 2 and 10 seconds, over a 35 minute period. Thus, the learning effects are likely exaggerated as the later calls are likely partially mapped to off-call driving performance, which would mean better performance.I would also put this stuff in an appendix.

Appendix Q: Driving Scenario Specifications

The STISIM driving simulator scenarios were programmed in order to abide by the following rules:

- 100% chance of cars at 10,15 or 20 s. intervals (random selection)
- 60% chance of approaching vehicles (oncoming lane)
- 25% chance of easy left/right, difficult left/right curves in the road, presented in time intervals of 30,35 or 40 s.

Appendix R: Road Curvature

When on call, the road was significantly more curved (RMS road curvature) for those with high desire for control (.000920 rad, .000821 rad, F[1,13]=6.698, p=.023). In contrast, the trend with RMS vehicle curvature was opposite that of the road curvature, where those with high desire for control had less vehicle curvature (0.001202 rad, 0.001197 rad, F[1,13]=3.645, p=.079). Though significant, a difference of 0.000005 radians is a marginal amount: 0.0002865 degrees.

As with desire for control, operating span is mildly confounded with RMS road curvature, where those with lower operating span encountered more curves during interruptions (.000897 rad, .000852 rad, F[1,13]=5.423, p=.037). RMS vehicle curvature and RMS steering angle were marginally larger for those low in desire for control (.001276 rad, .0001116 rad, F[1,13]= 6.565, p=.024; 21.054 °, 19.622 °, F[1,13]=3.329, p=.091).

A trend shows that those with a high operation span and low desire for control were exposed to less extreme road curves than other groups (F[2,26]=2.958, p=.070). Trends in vehicle curvature and steering angle echo the same predicament (F[2,26]=2.915, p=.072; F[2,26]=2.731, p=.084). (See Appendix O for details.)

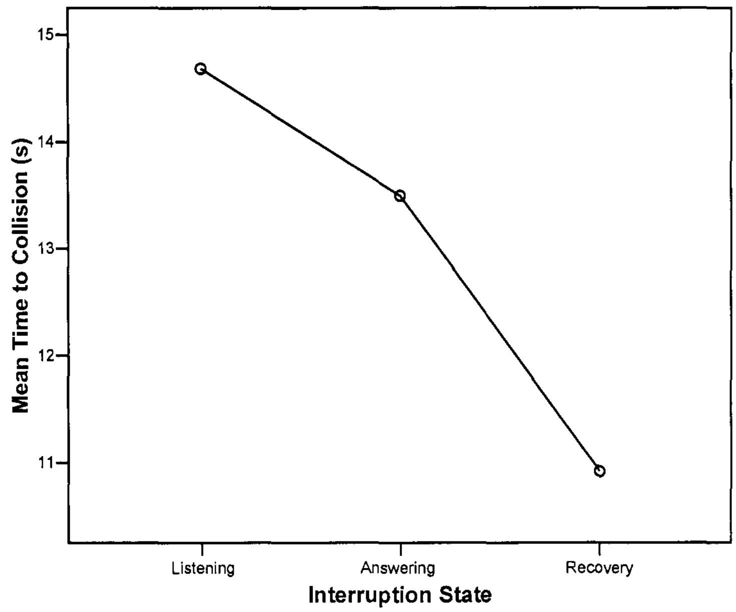
Appendix S: Additional results

Interruption State

Interruption states were not part of the hypotheses, but were statistically investigated. Interruption states were investigated in order to inspect performance decrements, especially during the cognitively demanding portion of answering the mathematical question. Driving during the recovery period was expected to be similar to off-call performance.

When comparing the interruption states of listening, answering and recovering from interruptions[11], there was a significant effect where the minimum time-to-collision at any one moment was lower for the recovery period (F[2,26]=3.390, p=.049; See Figure S1).

Mean Time to Collision across Interruption States



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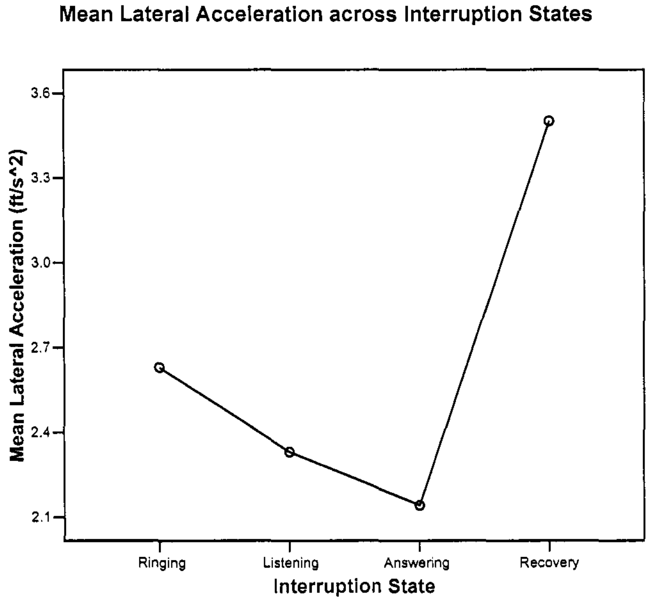
[11] Performance during the ringing portion of the negotiated interruptions was not looked in order to allow for a symmetrical analysis with the direct interruptions.

The above result follows from the lower-off-call average for time to collision.

There were borderline significant tendencies for RMS lateral acceleration to be higher during the recovery period (F[2,26]=2.885, p=.074), for variability in lateral acceleration to be higher in the recovery period (F[2,26]=3.123, p=.061), and for RMS longitudinal velocity to increase during recovery (F[2,26]=2.666, p=.088). As expected, these trends are in the same direction as off-call performance. (See Appendix O for details.)

Comparing the ringing state for the phone and pager interruptions, there were few significant effects. However, the RMS lateral acceleration were lowest during the listening and answering periods and highest in recovery (F[3,39]=3.035, p=.040; see figure S2). The pattern for variability in lateral acceleration was similar (F[3,39]=5.191, p=.033; see Appendix O for details).

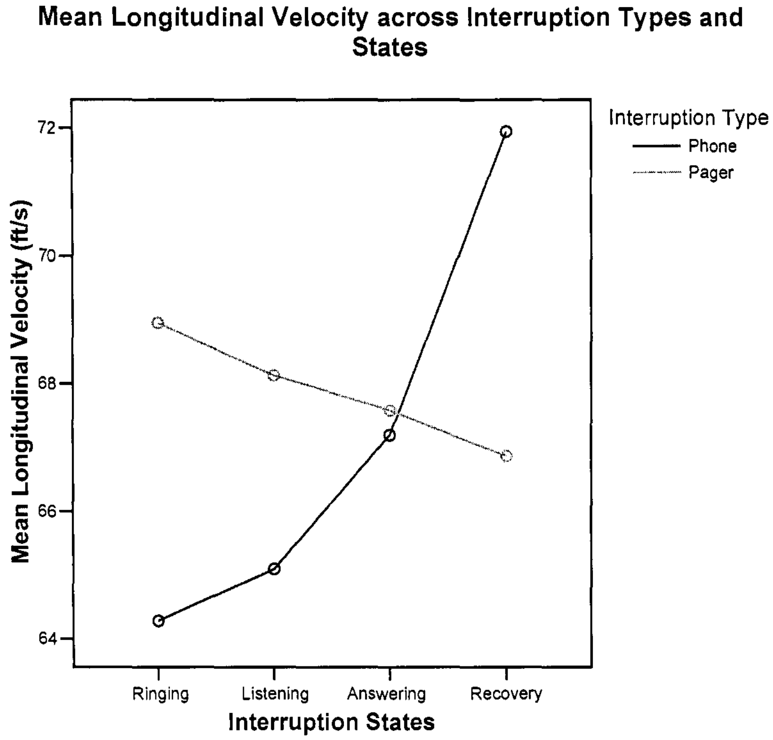


One interpretation of this result is that decreased lateral acceleration may correspond to increased mental load, as the listening and answering portion of the interruption likely require the most attentional resources.

Interruption type and state

Interruption type by state interactions were not part of the hypotheses, but were statiscally investigated.

The interaction between interruption type and state was investigated in order to assess differences between immediate and negotiated interruptions. The RMS longitudinal velocity increased from the beginning of the interruption to the end, while for pager it stayed relatively constant (F[3,39]=3.237, p=.032; see figure S3).



There was a borderline significant tendency for heading error to increase during the ringing portion of phone calls (F[3,39]=2.562, p=.069; see Appendix O for details). This result indicates a possible caveat for negotiated interruptions; while ringing is useful to warn the operator about a pending message, the ringing in itself is disruptive.

Borderline significant trends showed a that participants held a lower speed (RMS longitudinal velocity) while listening to the math question during direct and phone interruptions, while speed was higher when listening during pager interruptions. The increase in speed tended to be higher for phone interruption than for other types of interruption (F[4,52]=2.103, p=.094; See Appendix O for details). In the listening phase of negotiated interruptions, participants tended to maintain a higher time to collision than for immediate style interruptions. Time to collision dropped markedly for the recovery phase of phone interruptions (F[4,52]=2.377, p=.064).

Trends for Interruption Type

There were a few trends in driving performance for individual differences across interruption types. For immediate-style interruptions, dependents' RMS longitudinal acceleration is higher (F[2,26]=2.925, p=.071) and their throttle use is greater (F[2,26]=2.902, p=.073). There was a trend where RMS vehicle curvature was lower during phone interruptions (F[2,26]=2.774, p=.081).

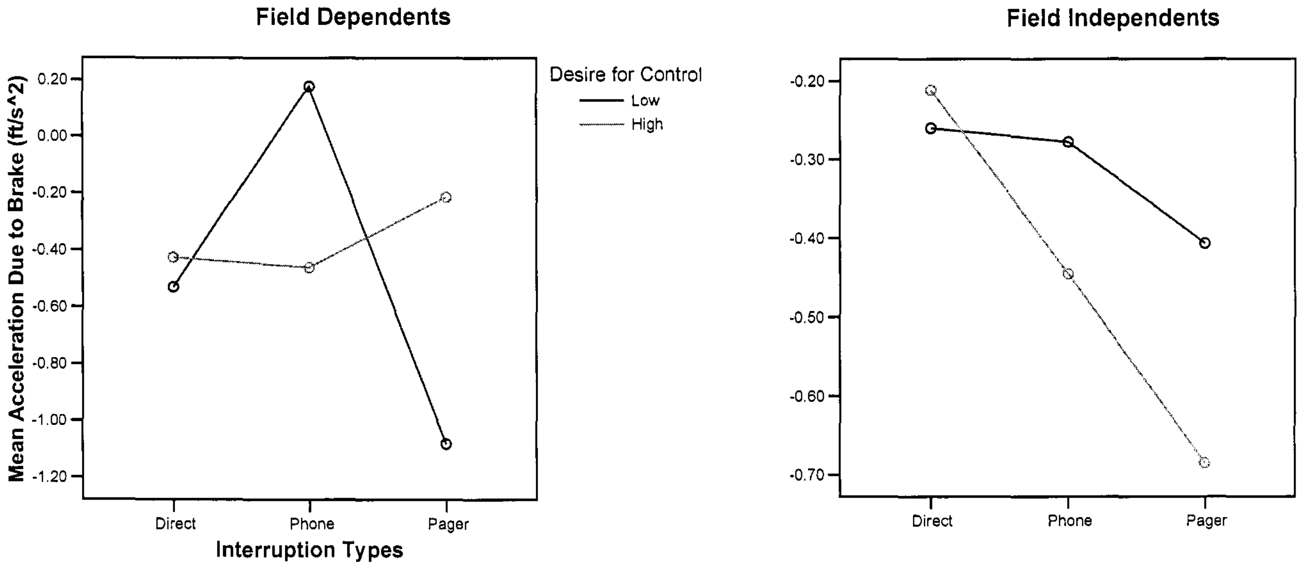
Interactions for Interruption State across Individual Differences

A number of trends were demonstrated for operation span and cognitive style. Dependents with low operation span accelerated the most during recovery while dependents with high operation span accelerated the least during this period (F{2,26]=3.148, p=.060). Dependents displayed more variability in their longitudinal acceleration except for those with high operating span during the recovery phase, who displayed the least variability (F[2,26]=2.716, p=.085). In terms of lateral acceleration, a trend showed that dependents with high operating span accelerated the least during listening and answering, and the most during recovery (F[2,26]=2.894, p=.073). The trends in the variability in lateral acceleration and in steering angle were similar (F[2,26]=3.101, p=.062; F[2,26]=2.724, p=.084). (See Appendix O for details.)

Interactions for Interruption Type across Individual Differences

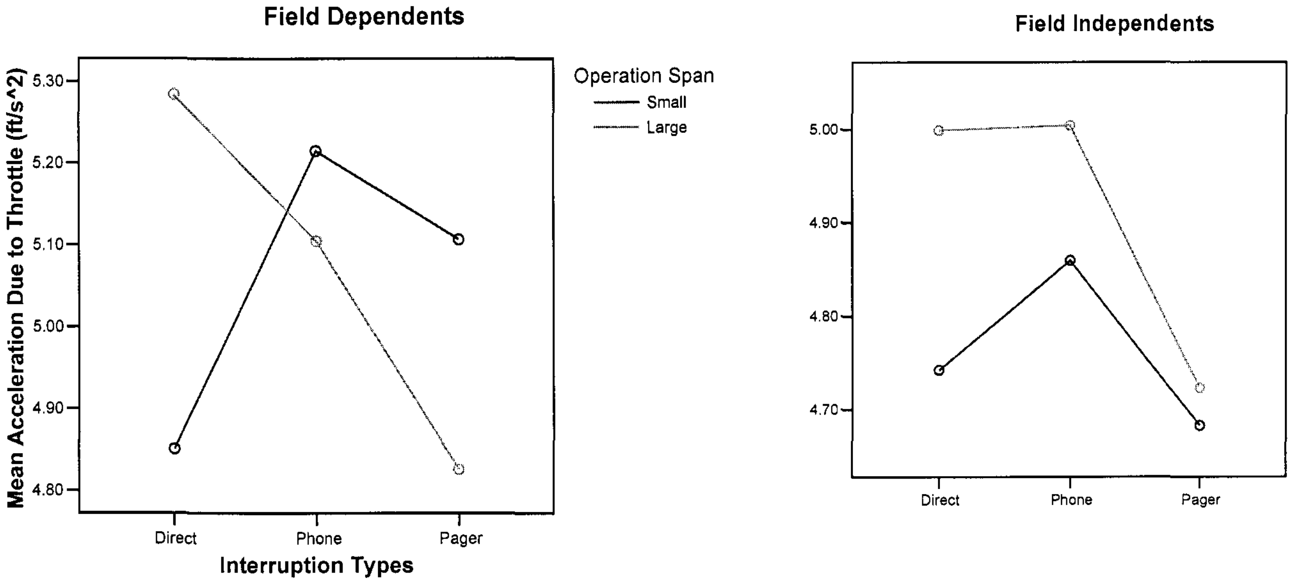
The following interactions between individual differences were not highly significant. The deceleration due to the brake was greatest during pager interruptions, least during phone, for dependents with low desire for control. Independents with high desire for control also decelerated significantly during pager interruptions (F[2,26]=3.359, p=.050; see figure S4a, S4b).

Mean Acceleration Due to Brake across Interruption Types for Cognitive Style and Desire for Control



A borderline significant effect showed that those with a small operating span and low desire for control accelerated the least during direct interruptions. During pager interruptions, those with low desire for control used the throttle less (vs. those with high desire for control, used the throttle more (F[2,26]=3.049, p=.065; See Appendix O for details).

Dependents with a high operating span accelerated with the throttle the most during immediate interruptions, and the least during pager interruptions (F[2,26]=3.762, p=.037; see figure S5a, S5b)



Mean Acceleration Due to Throttle across Interruption Types for Cognitive Style and Operation Span

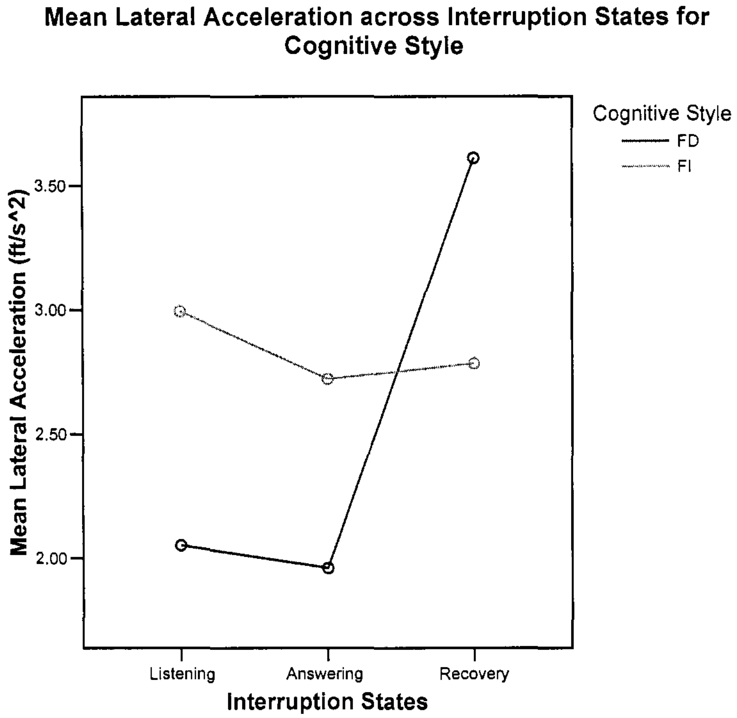
Operation span played the role in the above interaction as when looked at alone, with those with large operation spans accelerating more than those with smaller operation spans. The exception comes for the field dependents with small operation span who held the highest acceleration during pager calls. Concerning cognitive style, this effect seems to be in the opposite direction of H2.2.3.

Appendix T: Discussion of H2.2.3, H2.2.4, H2.2.5

H2.2.3 Field Dependence and Driving Performance

Investigating different reactions during the stages of interruptions, field independents held constant lateral accelerating while field dependents had less lateral acceleration during the listening and answering portions, and more during the recovery period (F[2,26]=5.975, p=.007; see figure T1).

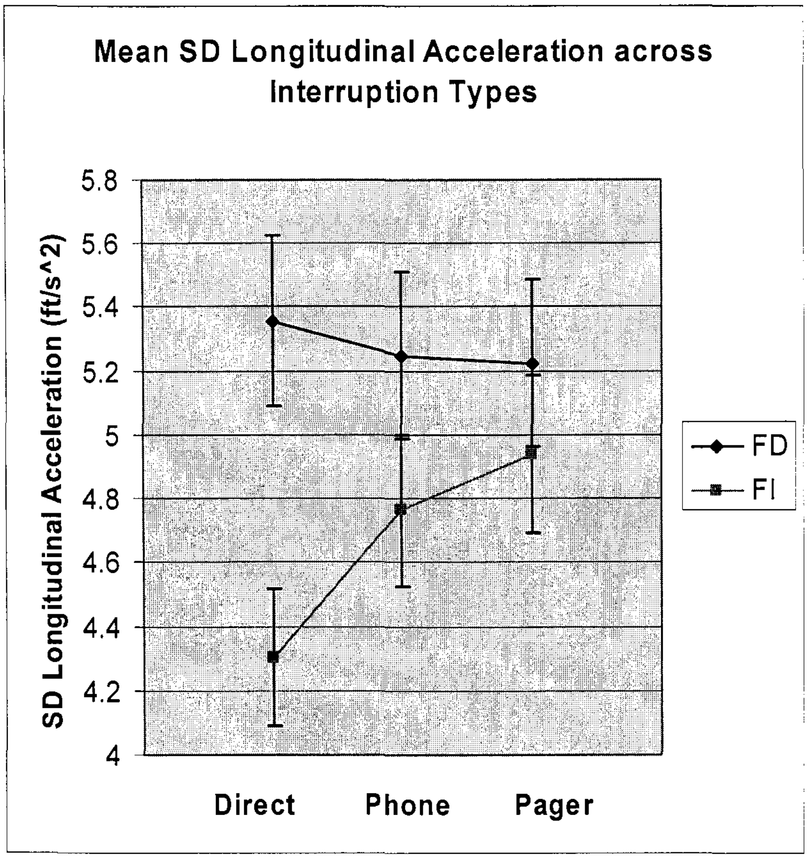
Figure T1.



The variability in lateral acceleration and the steering angle follow identical patterns (F[2,26]=5.941, p=.008; F[2,26]=5.971, p=.007; see Appendix N). A borderline significant effect with cognitive style indicates that dependents have more variability in their longitudinal acceleration, especially during the answering phase of direct interruptions and in the recovery phase of pager interruptions (F[4,52]=2.490, p=.054). A direct measure of longitudinal acceleration shows the same (F[4,52]=2.327, p=.068). (See Appendix for details.) Taken together, these results support that field dependents show greater variability in their on-call performance than field independents.

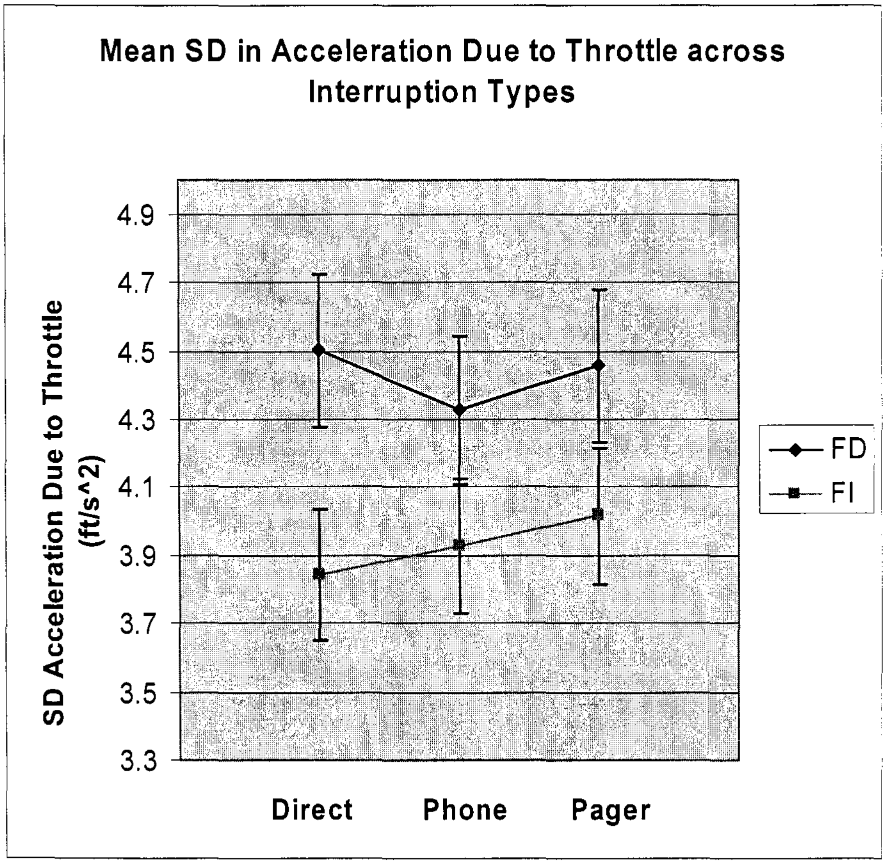
Cognitive style influenced behaviour differentially during immediate versus negotiated interruptions. During immediate interruptions, field dependents clearly had more variability in their RMS longitudinal acceleration than independents (F[2,26]=3.455, p=.047; see figure T2). Excess variability may be related to increased responsiveness to road conditions, or to a lack of monitoring of speed.

Figure T2.


Mean SD Longitudinal Acceleration across Interruption Types
SD Longitudinal Acceleration (ft/s^2)
5.8
5.6
5.4
5.2
5
4.8
4.6
4.4
4.2
4
Direct
Phone
Pager
FD
FI

The spike for field dependents and immediate interruption is also shown with variability in throttle use (F[2,26]=4.791, p=.017; see figure T3).

Figure T3.

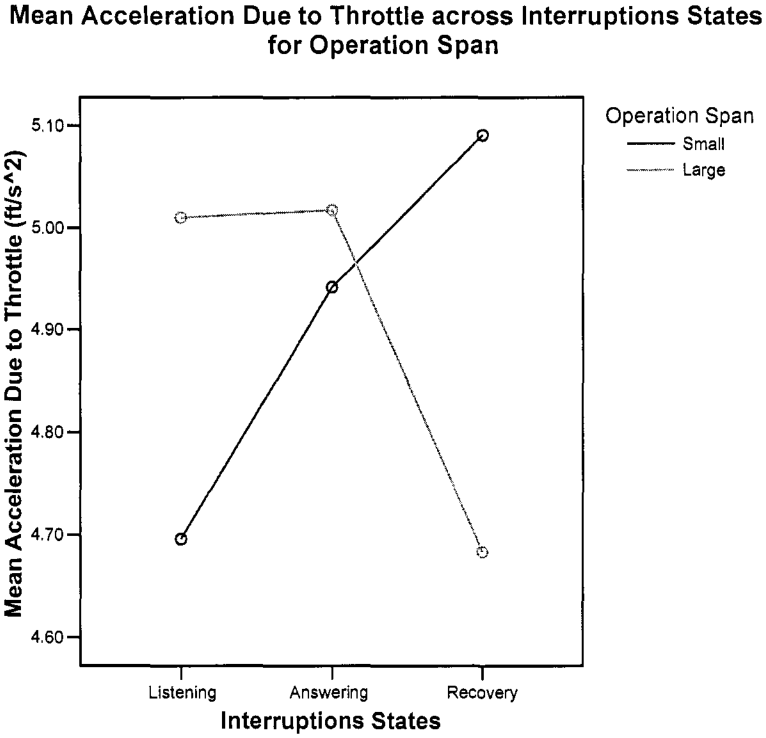


Variability in forward acceleration and throttle use indicates a significant difference between field dependents and independents during immediate interruptions, which supports the prediction of H2.2.3.

H2.2.4 Working Memory and Driving Performance

The interaction between interruption state and operation span was that those with a low span used the throttle less during listening and the most during recovery, and those with a large span held the opposite pattern (F[2,26]=4.501, p=.021; see figure T4).

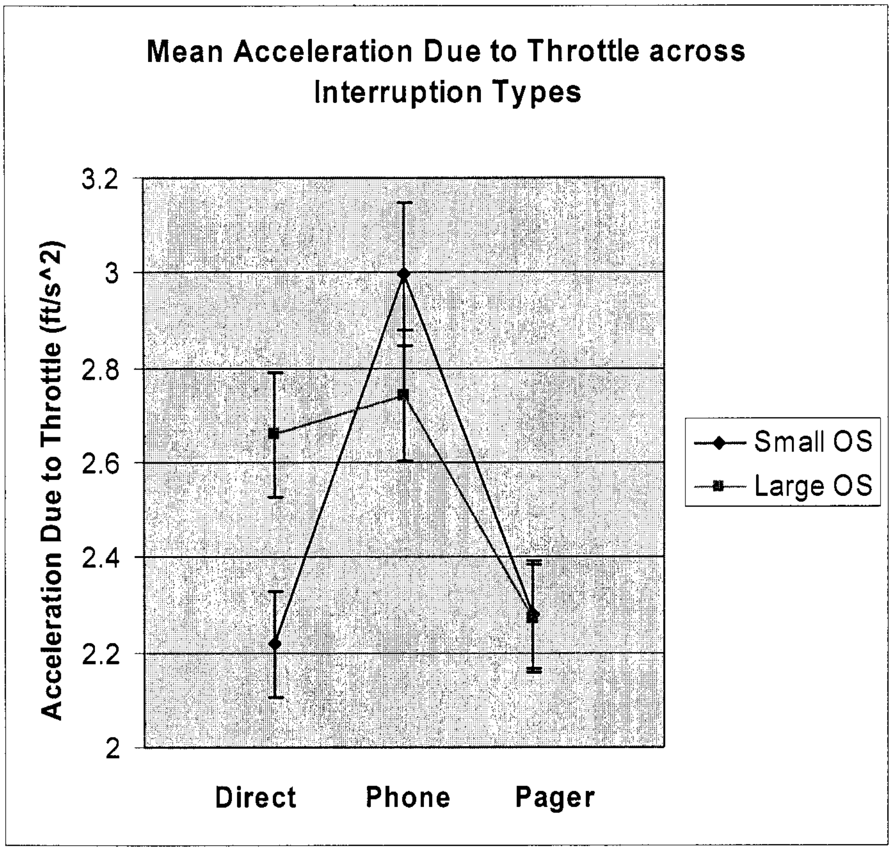
Figure T4.



The longitudinal acceleration measure was in the same direction: where those with low operation span accelerated more as the interruption proceeded, while those with high operation span accelerated less (F[2,26]=2.834, p=.077). A trend shows that those with high operation span had less heading error as the interruption progressed, while those with low operating span had a relatively constant rate of heading error (F[2,26]=2.925, p=.071). (See Appendix O for details.) Taken together, these results highlight that those with large operation span seem to be driving more carefully during interruptions (by accelerating less as the interruption progressed), with a benefit of reduced heading error.

Comparing the immediate versus negotiated style of interruptions, those with high operation span made greater use of the throttle during the immediate style interruptions and less during pager interruptions, while those with low operation span used the throttle at a constant rate (RMS acceleration due to throttle; F[2,26]=7.988, p=.002; see figure T5).

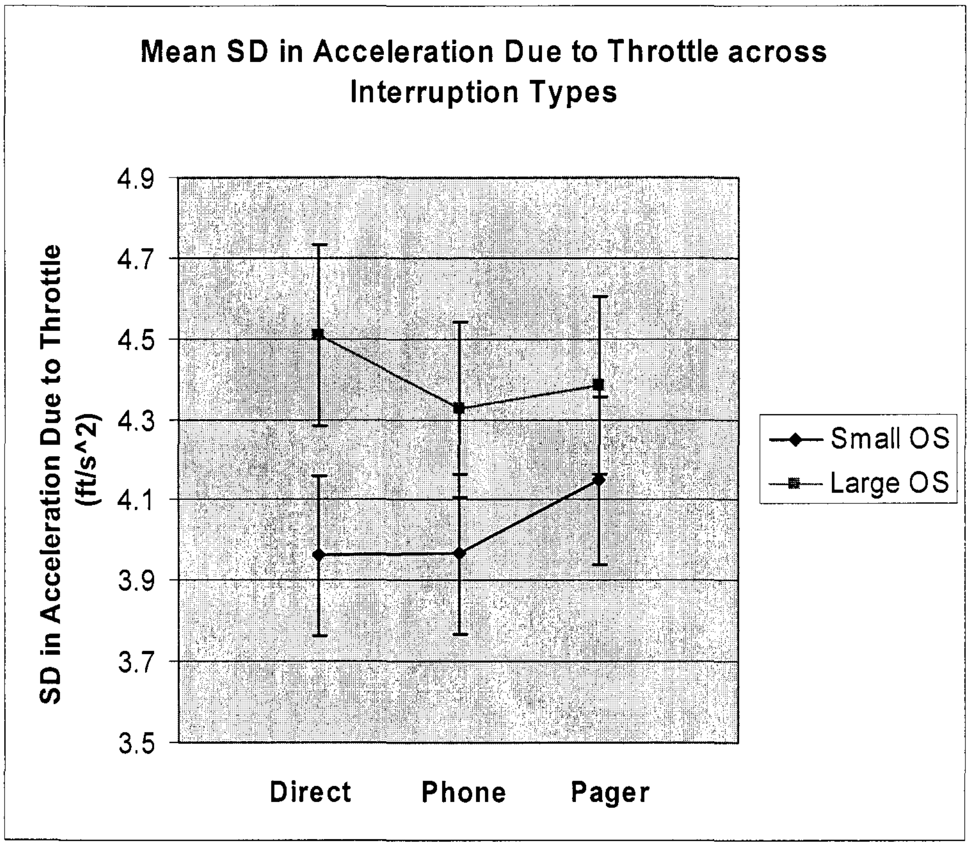
Figure T5.



Those with large operation span accelerated more off-call, and this pattern of behaviour is likely reflected in the direct interruption because participants have less segue (no ringing) to modify their behaviour. In contrast, those with large operation span likely used the pager beeping to choose the best time to answer the call, where little throttle responsiveness is needed, and they are able to focus more on the secondary task.

The variability associated with throttle use follows the same pattern (F[2,26]=6.333, p=.006; See Figure T6, below).

Figure T6.



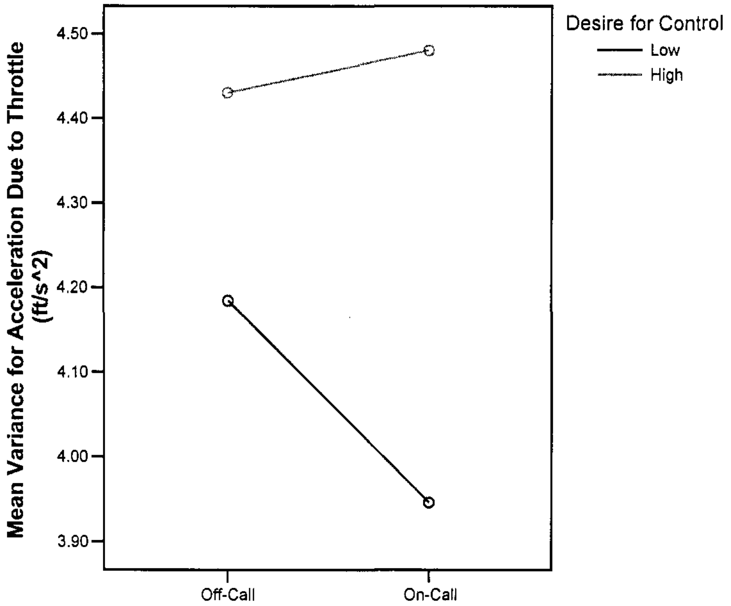
These two results indicate that those with large working memory engaged in more responsive behaviour during immediate interruptions, as predicted by H2.2.4.

H2.2.5 Desire for Control and Driving Performance

There was an interaction for desire for control and off and on call bahviour. Those with low desire for control had less variability off-call and a great reduction in variability when on-call, while those with high desire for control maintained a relatively stable usage of the throttle (SD of acceleration due to throttle), (F[1,13]=6.114, p=.028; see figure T7).

Figure T7.

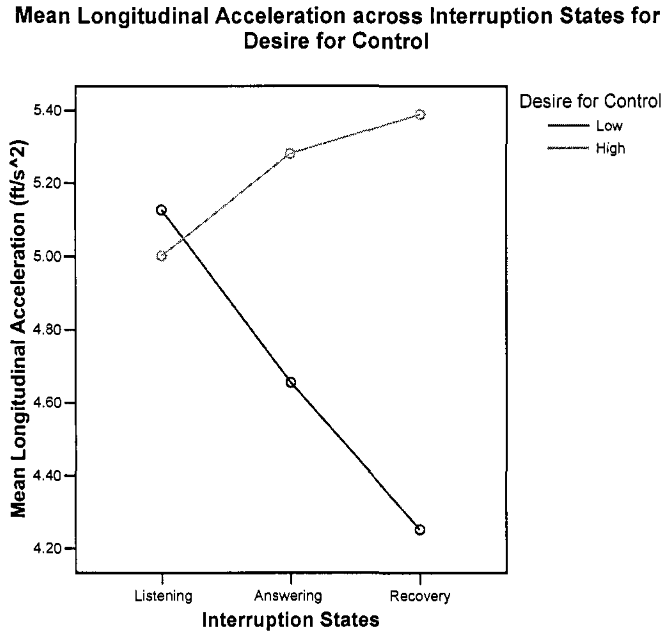
Mean Variance for Acceleration Due to Throttle On and Off Call



This suggests that those high in DfC continue to keep aggressive throttle use when those low in DfC use the throttle less during interruptions. This effect supports H2.2.5 where those low in DfC are expected to suffer a greater performance decrement during interruptions.

Looking at the stanges of the on-call period, those with high desire for control increasingly accelerated while those with low desire for control increasingly decelerated (F[2,26]=3.994, p=.031; see figure T8). The variability in longitudinal acceleration follows the same pattern (F[2,26]=3.381, p=.050; see Appendix O for details).

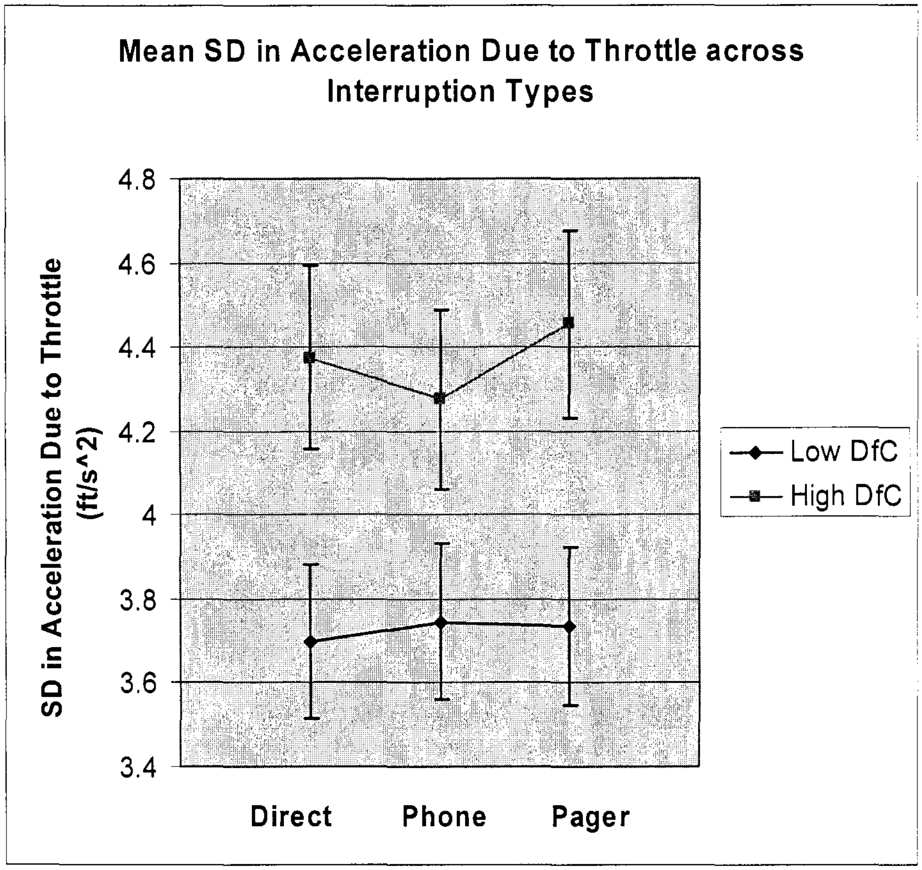
Figure T8.



A trend showed that those with low desire for control had less heading error as they were decelerating during the listening and recovery period (F[2,26]=2.647, p=.090; see Appendix O for details). Thus, as those with high DfC increase their throttle use throughout calls, there is a trade-off of greater heading error.

Comparing immediate and negotiated interruptions, those with higher desire for control had significantly more variability in their throttle use during negotiated interruptions than those with low desire for control (F[2,25]=4.972, p=.015; see figure T9).

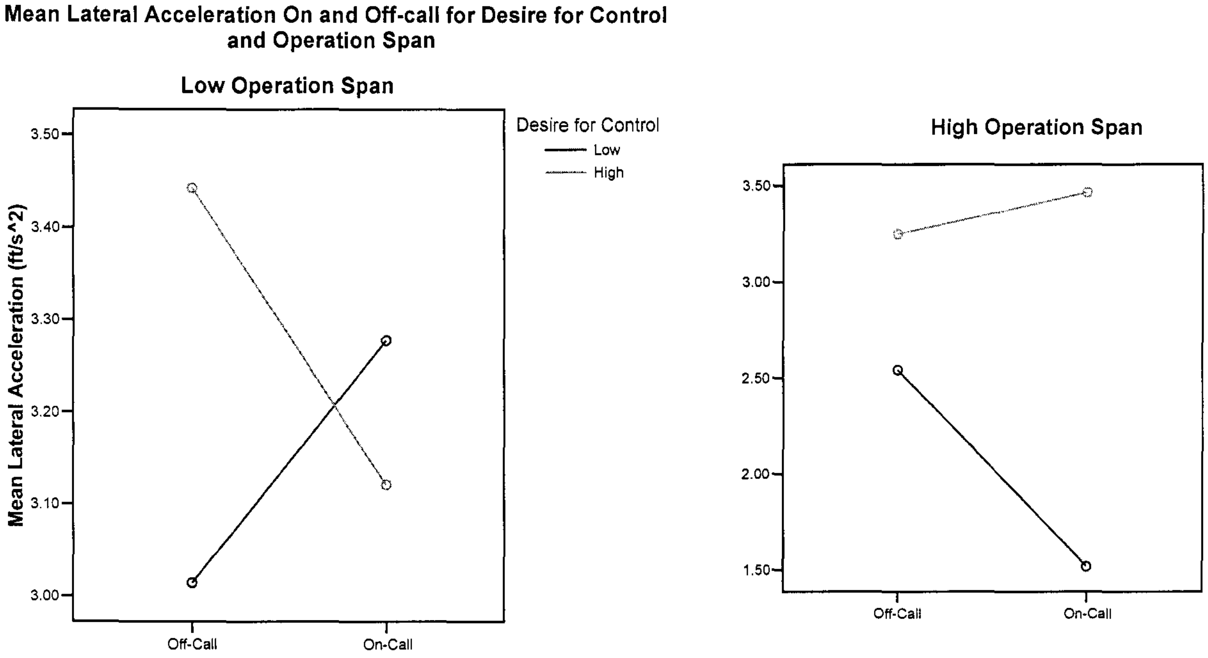
Figure T9.



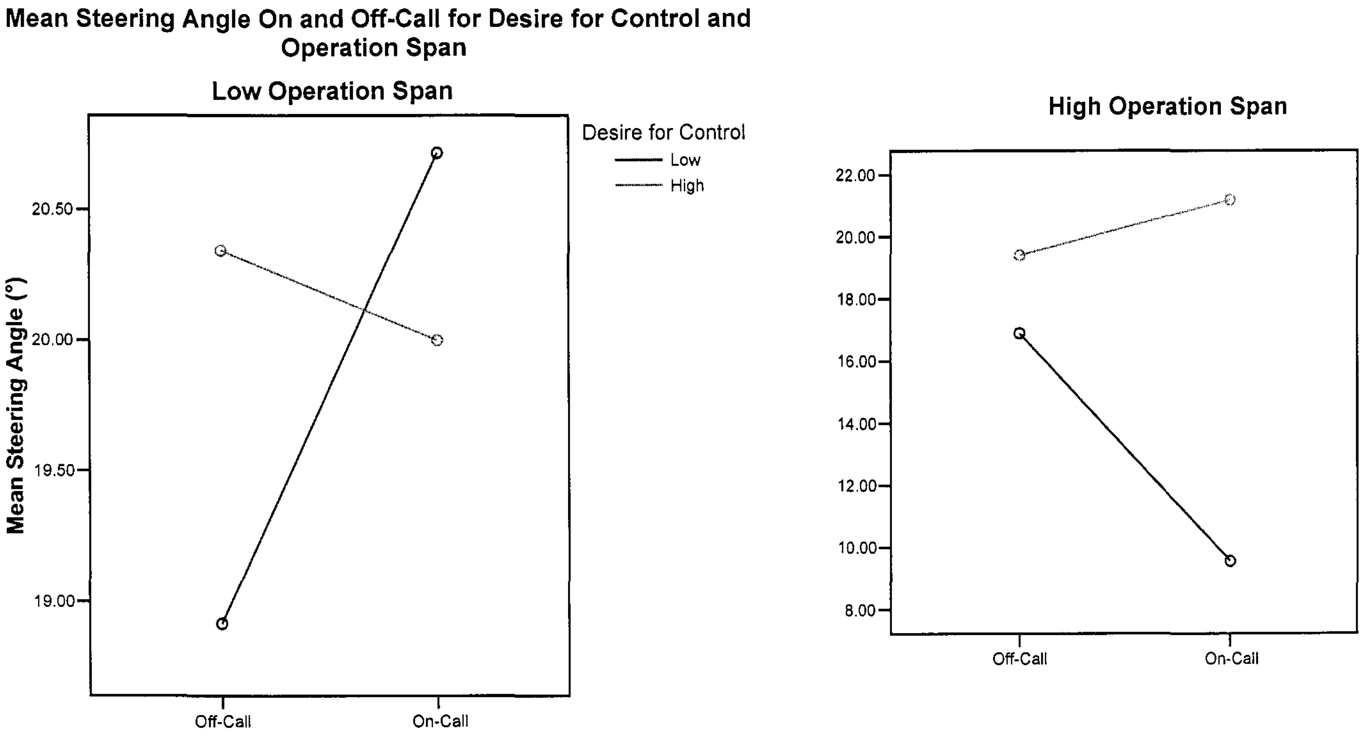
Additionally, during negotiated interruptions, trends showed that those with high desire for control accelerated more (RMS longitudinal acceleration; F[2,26]=2.953, p=.070) and braked less (acceleration due to brake; F[2,26]=3.016, p=.066; See Appendix O for details). These results and trends support H2.2.5, that those high in DfC are able to drive tended to be aggressive with strong acceleration and less braking, especially during negotiated interruptions.

Interactions between individual differences and driving performance

Operation span and desire for control interacted with regards to on and off-call performance. Off-call, those with low desire for control had marginally less RMS lateral acceleration than those with high desire for control, regardless of operation span. In contrast, on-call, those with low desire for control and high operation span had considerably less lateral acceleration (F[1,13]=4.770, p=.049; see Figure 18a, 18b). The variability in lateral acceleration followed a similar pattern (F[1,13]=4.700, p=.049; see Appendix O for details). Lateral acceleration is used when changing lanes, thus those with low DfC and large working memories chose to change lanes less often during interruptions, supporting H2.2.4 that those with large operation can better handle interruptions. (Figure T10a, T10b below).



Those with low desire for control and high operation span had a lower RMS steering angle on-call than the other groups (F[1,13]=6.075, p=.028; see figure 19a, 19b). This supports the previous interpretation that the low DfC, high WM group use less steering as they change lanes less often. (Figure T11a, T11b below.)

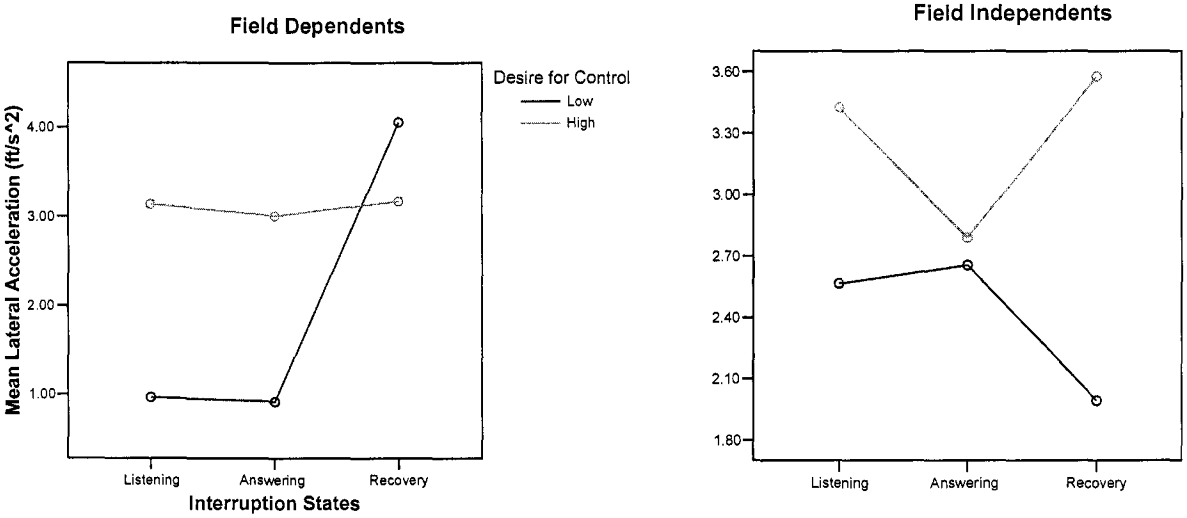


The trend in RMS vehicle curvature also supports this interpretation (F[1,13]=4.037, p=.066 see Appendix O for details and other trends).

Looking at the interactions during the stages of an interruption, field dependents with low desire for control had the least lateral acceleration during the listening and answering and has the most during recovery (F[2,26]=5.047, p=.014; see figure 20a, 20b). The variability of lateral acceleration and the steering angle held identical patterns (F[2,26]=5.501, p=.010; F[2,26]=4.113, p=.028). (See Appendix O for details). This effect supports H2.2.3 in the sense that dependents seem highly reactive, and it follows with previous trends of DfC which associate high DfC with greater acceleration.

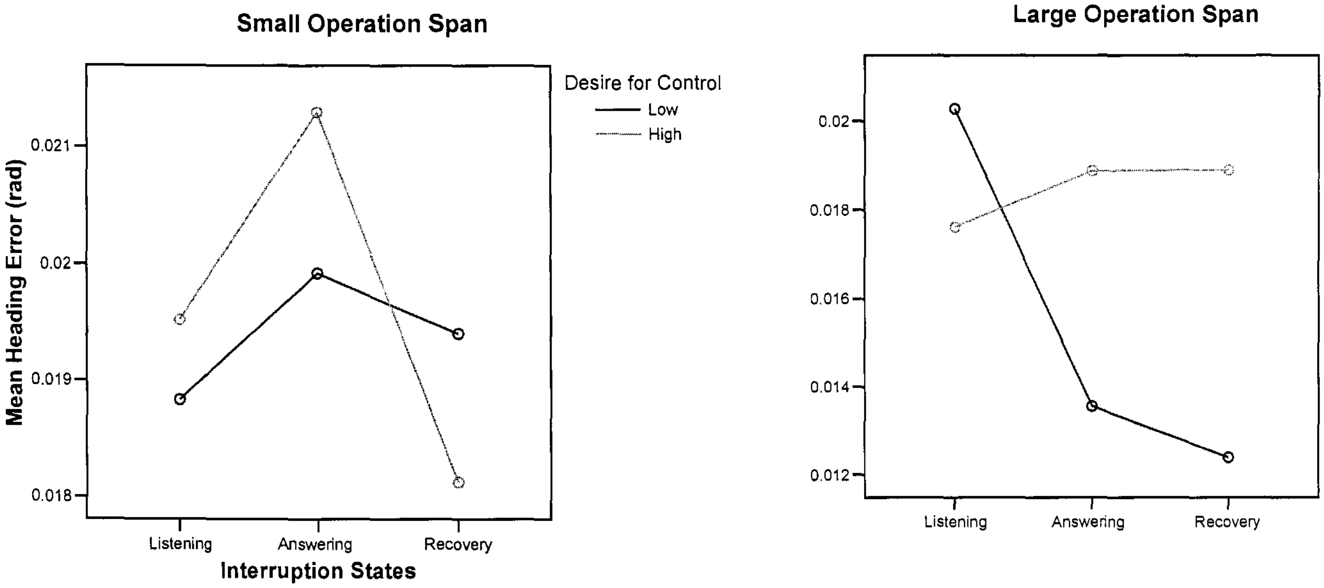
Figure T12a, T12b.

Mean Lateral Acceleration across Interruption States for Cognitive Style and Desire for Control



A trend showed that dependents with low desire for control held the lowest velocity for the listening portion of the interruption (F[2,26]=2.729, p=.084). Another trend with acceleration due to throttle showed that dependents with low desire for control accelerated less during the recovery phase while dependents with high desire for control accelerated more at that time. Independents with low desire for control held a constant low level of acceleration while independents with high desire for control held a high constant level (F[2,26]=2.654, p=.089). (See Appendix O for details.) Again, these effects are consistent with other effects where that high desire for control is associated with more acceleration during all stages of interruptions. The results suggest that a dependent cognitive style magnifies the inaggressive style of low desire for control.

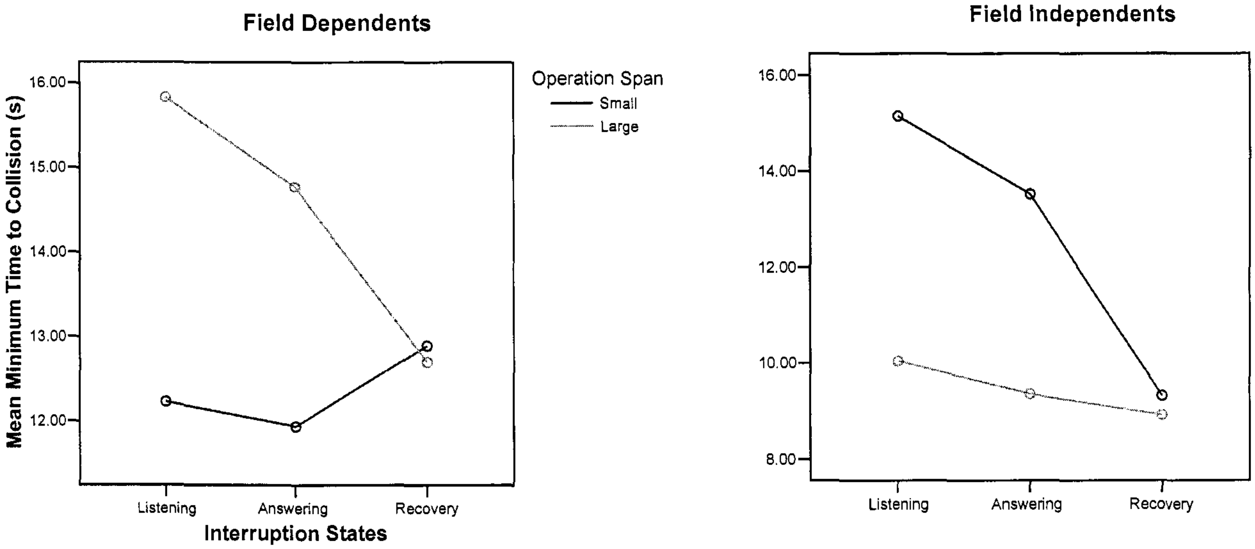
The measure of heading error showed that those with a large operating span and a low desire for control reduced their heading error during the answering and recovery phase, while others held a relatively highly level of error (F[2,26]=3.541, p=.044; see figure 21a, 21b). Here, operation span interacts with low desire for control, magnifying the inaggressive behaviour in exchange for more exactitude in driving. (Figure T13a, T13b below.)



Mean Heading Error across Interruption States for Operation Span and Desire for Control

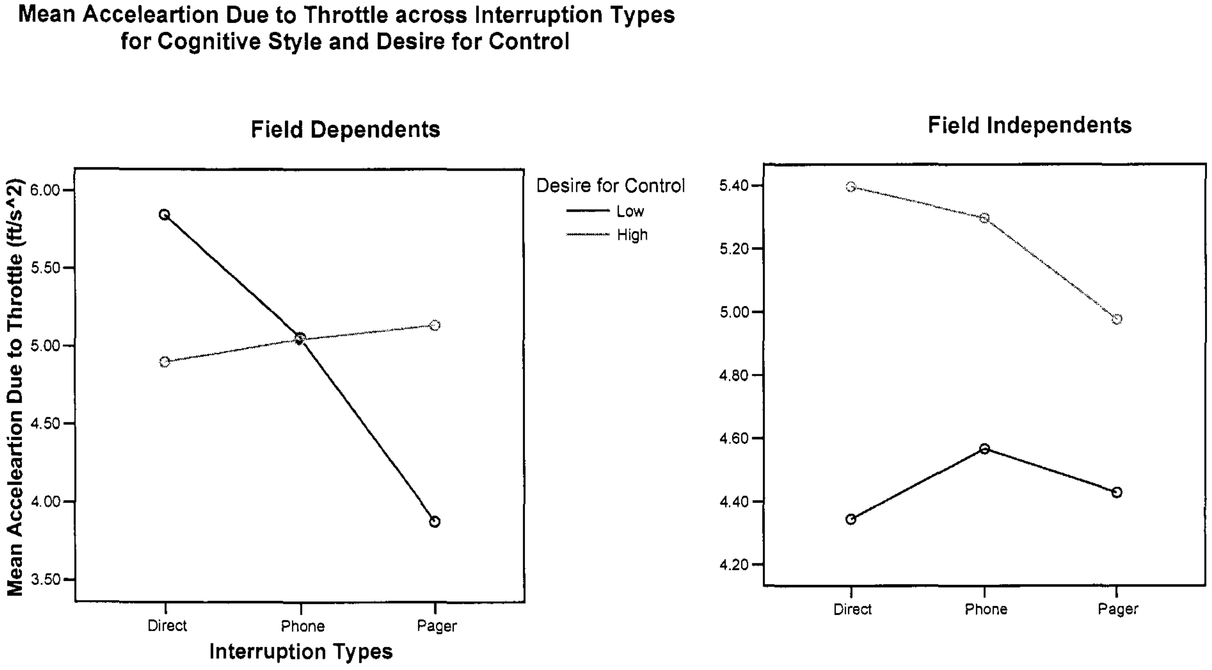
Dependents with large operating span and independents with small operation spans kept larger time-to-collision during the listening and answering phases, while independents with large operating spans consistently kept the lowest (F[2,26]=3.468, p=.046; see Figure 22a, 22b). This effect shows that the intersection of field independence with large operating span lends itself to less need for a large buffer safety zone. In other words, field independents with a large operation can handle safe driving with lower minimum time to collisions (as shown by no greater tendency towards collisions. See next section.). (Figure T14a, T14b below.)

Mean Minimum Time to Collision across Interruption States for Cognitive Style and Operation Span



A borderline significant effect in acceleration due to throttle showed that independents kept a constant rate of acceleration, and dependents with low operating span had the lowest acceleration during listening and the highest during recovery while dependents with high operating span decreased the most during recovery (F[2,26]=3.249, p=.055). This effect is consistent with the one above in that dependents with small operating spans tend to reduce their speed to be able to focus their mental resources on listening to the mathematical question.

With regards to type of interruption, one significant interaction between the individual differences occurred. Field dependents with low desire for control had the highest throttle pressure for immediate interruptions, and the lowest for pager interruptions. Independents with high desire for control had relatively high overall throttle use, while independents with low desire for control had relatively low overall use (RMS acceleration due to throttle; F[2,26]=6.088; p=.007; see figure 23a, 23b; see Appendix O for trends). (Figure T15a, T15b below.)



The previous effect suggests that behaviour of FDs with low DfC indicates high reactivity for immediate interruptions, which follows from H2.2.3, while the trends with those high in desire for control support H2.2.5.