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The effects of focused attention training (FOCAL) on the duration of novice drivers' glances inside the vehicle

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Abstract

Several studies have documented that the failure of drivers to attend to the forward roadway for a period lasting longer than 2-3 seconds is a major cause of highway crashes. Moreover, several studies have demonstrated that novice drivers are more likely to glance away from the roadway than experienced drivers for extended periods when attempting to do a task inside the vehicle. The present study examines the efficacy of a PC-based training program (FOCAL) designed to teach novice drivers not to glance away for these extended periods of time. A FOCAL-trained group was compared to a placebo-trained group in an on-road test, and the FOCAL-trained group made significantly fewer glances away from the roadway that were more than 2 seconds than the placebo-trained group. Other measures indicated an advantage for the FOCAL-trained group as well.

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novice drivers; attention; training; distraction; eye movements; field driving study

1. Introduction

The failure to maintain attention to the driving task has long been recognized as a major contributor to automobile crashes (Wang et al., 1996). The Virginia Tech Transportation Institute estimates that secondary-task distraction contributed to over 22 percent of all crashes and near-crashes (Klauer et al., 2006). The United States Department of Transportation estimates that in 2010 nearly 6,000 people died in crashes involving a distracted or inattentive driver and more than half a million were injured (Department of Transportation, 2009a). These are only estimates. However, even if the estimates are twice what the actual values are, there is little room for complacency.

The magnitude of the problem is only likely to increase because of the growing popularity of in-vehicle tasks that require the driver to glance away from the forward roadway – most notably navigating with GPS devices and text messaging with cell phones (Lerner and Boyd, 2004; Strayer et al., 2003). The problem may also increase because of recent changes in the environment, such as digital billboards that present information that may attract drivers' eyes away from the forward roadway for extended periods of time (Beijer et al., 2004; Milloy and Caird, in press; Smiley et al., 2004; Wallace, 2003).

There is now a growing body of research indicating that distraction is a particular problem among novice drivers. The evidence for this comes from many different sources, including police crash reports (Braitman et al., 2008; McKnight and McKnight, 2003; Wang et al., 1996), naturalistic studies (Klauer et al., 2006), field experiments (Wikman et al., 1998; Lee et al., 2006), simulator studies (Chan et al., 2010; Greenberg et al., 2003), and surveys of novice drivers (Olsen et al., 2005). For example, a now well publicized field study of naturalistic driving inferred eye-glances from videos recorded by in-vehicle cameras facing the driver (Klauer et al., 2006). This study estimated that the crash rate for inattention related crashes among 18 to 20 year olds was up to four times larger than for older drivers.

A definition of driver distraction proposed by Lee, Young, and Regan (2008) states that “Driver distraction is a diversion of attention away from activities critical for safe driving towards a competing activity”. This definition thus labels distracted driving as characterized by inattention, mainly due to secondary tasks, and not by factors such as drowsiness, fatigue, or highway hypnoses. Although the latter issues undoubtedly are ones of importance, the evidence for the prevalence of inattention-related distraction is clear and thus the specific target of this study is inattention and secondary task distractions and, in particular, those inattention and secondary task distractions that occur inside the vehicle. Of the 22% of the crashes and near crashes that Klauer et al. (2006) found were caused by inattention, some 80.4% were caused by in-vehicle distractions (see Table 2.7 in Klauer et al. 2006).

The question arises at this point as to why young novice drivers are more likely to be involved in crashes where distraction is a factor. There are many reasons why this might be the case. It is well known that young, novice drivers are more willing to engage in distracting activities such as texting, talking on a cell phone, and operating various in-vehicle devices (Olsen et al., 2005; Lerner and Boyd, 2005). It is also well known that experience plays a critical role over the first six months, leading to large reductions in crash rates for drivers of all ages, but especially for teen novice drivers (Vlakveld, 2005). This lack of experience may be an additional reason novice drivers are more easily distracted, said drivers being more distracted in this case by the relatively simple demands that obeying

the traffic laws and operating the vehicle place upon them (Organisation For Economic Co-Operation And Development, 2006). More experienced drivers, because more practiced, have more attentional capacity to devote the other critical aspects of the driving task (e.g., hazard anticipation). Most recently, attention has focused on developmental issues. First, the normal developmental progression which extends into the twenties in areas of the brain underlying executive function (Blakemore and Choudhury, 2006) has been posited to contribute to increased driving risk among novice drivers in their teens. In addition, there are the continuing problems that individuals diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) have with driving (Barkley and Cox, 2007). Such problems are especially common in males (Jerome, Segal and Habinski, 2006). Perhaps even more troublesome than novice drivers' willingness to engage in distracting activities is that they are willing to be distracted by an in-vehicle task to glance for especially long periods of time inside the cabin of the automobile. This increase in the duration of the in-vehicle glances of novice drivers is confirmed by work both in the field (Wikman et al., 1998) and in the lab using a driving simulator (Chan et al., 2010). For example, in a field study reported by Wikman et al. (1998), 46% of the inexperienced drivers (average age 19 years) glanced longer than 2.5 s inside the vehicle while performing three in-vehicle tasks whereas only 13% of the experienced drivers (average age 36 years) glanced longer than 2.5 s inside the vehicle while performing the three tasks. In a simulator study reported by Chan et al. (2010), inexperienced drivers (average age 16.8 years) performing an in-vehicle task had a glance longer than 2.5 s in 45% of the tasks whereas more experienced drivers (average age 23.9 years) had a glance longer than 2.5 s in only 10% of the tasks.

The question remains, however, whether especially long glances inside the vehicle are problematic. There have been a number of different lower-bound thresholds for "long glances" that have been suggested (e.g., Green, 1999b). However, these earlier thresholds were not based on direct observation of glance durations and crashes. More recent studies have offered thresholds based on such observations. For example, in a simulator study reported by Horrey and Wickens (2007), glances longer than 1.6 s inside the vehicle, while constituting only a relatively small fraction of the total glances (22%), were responsible for the great majority of crashes (86%), and in a naturalistic field study, glances longer than 2 s inside the vehicle increased the crash risk by about a factor of three (Klauer et al., 2006).

A number of ways of dealing with the problems caused by distraction have been proposed. In some cases, as in texting, outright bans are being imposed in countries around the world -- some 50 to date (Cellular News, 2010). However, legal bans by themselves will not be sufficient. After all, drivers do need both to glance inside their vehicles for reasons critical to driver safety (e.g., operating vehicle controls such as the defroster or the emergency flashers) and to glance at the rear and side view mirrors. Thus, other types of remediation need to be considered.

Towards this end, various rules have been devised by standards committees to limit the impact of distracting in-vehicle tasks on driving performance. As one example, Green suggested using as a standard the maximum time that a particular in-vehicle task takes to complete (Green, 1999a). This maximum time serves as the basis for SAE Recommended Practice J2364. Known as the 15 second rule, the rule specifies that an in-vehicle navigation task should take no more than 15 seconds in total to complete (Society of Automotive Engineers, 2004). Green (2007) was very clear that this does not mean that it is safe for the driver to have his or her eyes off the road for 15 seconds continuously, but did not specify how long a glance (i.e., a gaze duration) should be, other than that it should not be too long. As a second example, Zwahlen, Adams and DeBald (1988) argued that the mean or average single glance duration should be no greater than one second and the number of glances no greater than three. More recent research suggests that *single* glances away from the forward

roadway should not be very long at all, and certainly no longer than 2.0 s (Horrey and Wickens, 2007; Klauer et al., 2008). However, it is hard to see how manufacturers could design their devices in ways which limit individual glance durations.

One final alternative to consider is training, especially if the problem is most acutely centered among novice drivers. Novice drivers are often thought of as resistant to the effects of training (Mayhew and Simpson, 2002). But recent research that targets a very specific behavior, hazard anticipation, suggests that training can work with novice drivers, both on the driving simulator (Pollatsek et al., 2006) and in the field (Pradhan et al., 2009a). Related research with older adults learning to take secondary looks at intersections (Romoser and Fisher, 2009) and younger adults learning very specific defensive driving maneuvers (e.g., allowing oncoming traffic to pass before overtaking an obstacle; Ivancic and Hesketh, 2000) suggests that the success of the hazard anticipation training is tied largely to what is called error learning. In error learning, participants are allowed to make errors, are then apprised of their errors, and then allowed to correct the errors.

With this in mind, a review was undertaken of training programs for novice drivers and, in particular, those which might be used to limit the duration of in-vehicle glances (Thomas, Blomberg and Fisher, 2008). No such programs were found. Thus, a PC-based training program, FOCAL (FOrward COncentration and Attention Learning), was developed that was designed to limit the duration of the glances that novice drivers take away from the forward roadway to under two seconds. This training program used error learning as a key component (Ivancic and Hesketh, 2000). Specifically, the participants could make errors (glance for too long at a simulated in-vehicle task) and then correct these errors after being given feedback. Participants were randomly assigned to a FOCAL training group or a placebo training group. Using the well known Posttest Only Control Group experimental design (Campbell and Stanley 1963), the distribution of the glance durations of novice drivers using the training program, FOCAL, was then compared with the distribution of the glance durations of novice drivers given placebo training. The eye behaviors were gathered in the field with a driving instructor in the front seat. The participants' eyes were tracked throughout the drive. The key unknown was whether a rather simple, one hour PC-based training program using error learning as a key component would reduce the number of especially long glances away from the forward roadway on the open road.

2. Method

2.1. Participants

Participants were recruited from a high school in New Jersey, USA. The recruiting flyer indicated that they could participate only if they had a learner's permit and at least five hours of driving experience, or had held a restricted driver's license for less than six months (in New Jersey the holder of a restricted driving license under 21 cannot travel during certain hours of the night and may only have passengers from their shared residence plus one additional person). Forty students signed up for the study, 20 randomly assigned to FOCAL training and 20 to placebo training. One did not show up at the scheduled time and two others had mostly missing data because the eye tracker could not be calibrated due to excessive glare from their eye glasses. Of the remaining 37 participants, 19 were in the FOCAL training group (10 males, 9 females) and 18 in the placebo training group (11 males, 7 females). Both groups ranged from 16 years 0 months to 17 years 0 months, and the mean ages of the FOCAL and placebo training groups were 16 years 8.4 months and 16 years 9.1 months, respectively, $t(35) = .25$.

For the FOCAL group, 26% had a restricted driver's license, whereas 17% had a restricted license in the placebo group, but the difference was not significant ($t < 1$). However, when

the drivers with a learner's permit and those with a restricted license are considered separately, the placebo group had driving privileges for more months. For the drivers with the learner's permit, the mean numbers of months of driving privileges were 6.0 and 4.8 for the placebo and FOCAL groups, respectively, and for the ones with a restricted license, the respective averages were 3.3 and 2.0 months.

It is difficult to assess the relative overall experience of the two groups because the New Jersey rules for learner's permits (two different classes) and provisional licenses are complex. However, regardless of the class of learner's permit, drivers must hold the permit at least six months, but many hold it longer. Making a generous estimate of an average of 15 months with a learner's permit before getting the provisional license (this needs to be estimated since the drivers with a restricted license were not asked how long they had held a learner's permit), the placebo group actually had slightly higher average time having some sort of driving license (8.1 vs. 8.0 months).

Lastly, only two of the participants had any blemishes on their driving record; one placebo driver had been ticketed for a traffic violation and one FOCAL driver had been in a minor traffic accident.

2.2. Training

The training was a computer based program designed in-house: (a) to establish a baseline for a user's attention maintenance behavior, (b) to use that information as a teaching tool regarding the particular user's behavior, and then (c) to train the user in better driving-related attention maintenance techniques. The baseline was established using a pre-test, henceforth referred to as the AMAP (Attention Maintenance Assessment Program). It formed the input to the initial module of the overall FOCAL training program. Below is a discussion of the common features of AMAP and FOCAL followed by a discussion of their more specific characteristics (also see Table 1).

Both the AMAP pretest and the FOCAL training program were presented in an interactive computer environment with several modules, each of which contained either just a set of videos of driving scenes or a set of video-map pairs. Each video was a pre-recorded clip of a scene visible out of the windshield of a moving vehicle, shot from the viewpoint of the driver. Each map that was paired with a video showed street names and a configuration of streets on the map which were not related to the ones in the video; the participant was informed of this fact. This is a situation similar to what one confronts when one is in one location (represented by the video) and looking for directions in another, distant location (the map).

In both AMAP and FOCAL, participants in most modules had to perform a primary (video) and secondary (map) task. In the primary task (video), which was used as a surrogate for the driving task, the driver was instructed to indicate, using key presses, certain safety related events that could transpire during the length of the video, such as the presence of pedestrians or oncoming vehicles. In the secondary task (map task), the driver was asked to scan the map for a target street name at the same time as he or she was performing the primary task (video). When a video and map task were paired in a module in either the AMAP or FOCAL program, the visual input for only one of the tasks was displayed at any instant. Either the primary task (video) was displayed on the top half of the screen or the secondary task (map) was displayed on the bottom half of the screen. The task that was not displayed was blacked out (Figure 1). The user had to manually toggle, via a key press, between the two views. This was intended to simulate the driver's view when glancing inside or outside the vehicle: when glancing at the forward roadway, the interior is not visible and conversely. This approach was modeled on the occlusion technique that's used to simulate shifts in visual

attention during driving, and to assess visual demands imposed by in-vehicle tasks (Brook-Carter et al., 2009).

The particulars of AMAP and FOCAL are now discussed below. AMAP consisted of one module consisting of four video-map pairs. The user was asked to perform the primary and the secondary tasks for each of the four video-map pairs. The user's inputs such as toggle times and key strokes were internally recorded by the program. No feedback was given in AMAP.

FOCAL consisted of four modules presented in the same order across participants. As noted above, the AMAP (pretest) module always preceded FOCAL. In the first module (*feedback*) of the FOCAL training, feedback was provided to the user. Based on the inputs from the AMAP session, the video-map pair in AMAP with the user's poorest performance was selected (i.e., the video-map pair was selected in which the user had the longest single glance at the map view). This video was then played back to the user in the first FOCAL module. There was no associated map task in this module. However during this playback session, in the exact moments when the user had originally switched to the map task, the view of the video was completely blacked out for the same duration that the user had originally looked away from the video. The video did not actually stop during the blackout but continued running in the background. Thus, if a user had looked towards the map for 4 seconds at one stretch, then looked at the forward roadway for 2 seconds and back down at the map for 2 seconds, the video playback would show a blacked out screen for 4 seconds, the forward view for 2 seconds, and then the blacked out screen for 2 seconds, and so on. This first module was intended to instill in the user an appreciation for the fact that while one looks inside the vehicle to conduct an in-vehicle task there is essentially no information that is being processed from the forward roadway.

In the second module (*timer*), the same sequence of videos and blank screens was again shown to the user. However, now a clock appeared on the blank screen which showed the seconds ticking away that had elapsed while the user was looking away from the roadway in the AMAP pre-test. The video remained blacked out during such occasions.

The third module (*three-second in-vehicle glance training*), was divided into two submodules. In each submodule, the user was asked to perform the primary and secondary tasks. In the first submodule, containing three tasks, the user was told to keep his or her glances at the map to a maximum of three seconds and was given direct feedback on this: if the map remained on the screen longer than three seconds, the video screen automatically replaced the map screen. In the second (test) submodule which contained four tasks, the duration of the map was up to the user to control. The fourth module (*two-second in-vehicle glance training*) was identical to the third module (containing two submodules) except that the time threshold was two seconds. In the third and fourth modules, users were told that penalties were imposed either for exceeding the duration threshold on the secondary task (three and two seconds, respectively, in the two test submodules), for poor performance on the target search task on the map, or for missing essential safety related events on the forward view video. As a penalty for poor performance on the task, the user had to repeat the task; however, at most, they were required to repeat it twice.

In summary, FOCAL was designed so that the video-map tasks would mimic the attention distribution aspects of performing a secondary in-vehicle task while driving, and the training would first indicate to the driver how much relevant driving information was being missed during long glances away from the roadway (i.e., that he or she was committing serious errors; modules one and two) and then would use those errors as a basis for training the driver to get a sense of what a 3 and 2 second duration felt like (modules three and four). For

reinforcement purposes, to provide context, and to summarize the training, the program concluded with text displaying details about the risks of having one's eyes off the road while driving, an overview of occasions when such behavior may be necessitated by driving conditions, and information about the importance of not making extended glances away from the forward roadway. Altogether, the AMAP pre-test and post-test modules and the FOCAL module took less than an hour to complete. The AMAP and the FOCAL modules took about 5 minutes and 45 minutes, respectively.

The placebo training consisted of a *Rules of the Road* paper packet. This packet contained standard information on road signs and traffic regulations compiled from the Massachusetts Registry of Motor Vehicles Driver's Manual. As part of the training, participants completed a test after they had read the materials. The test was open book and contained questions that were sufficiently difficult so that most participants had to re-read the materials.

2.3. AMAP and FOCAL procedure

All users started with a *practice section* in order to familiarize them with the AMAP program interface, the videos, the maps, and the task of toggling between the video and map tasks. All users were then given AMAP as a pre-test. This was followed by FOCAL training for a randomly selected half, placebo training for the other half. Finally, AMAP was also given as a posttest to all users. (This was after training but before the road test about to be described.) Four laptops were used for training – two for FOCAL training and two for placebo training.

2.4. Equipment during test

An ASL Mobile Eye eye-tracker was used to collect eye movement data. The Mobile Eye is a compact tetherless eye tracking system consisting of two miniaturized cameras, a scene camera and an eye camera, mounted on safety eye-glasses and connected to a Digital Video Recorder. This configuration of the equipment allows it to be used in the field under daylight conditions. The two cameras capture synchronized video streams at 30 Hz which are interleaved and the resulting interleaved video data is stored on the Digital Video Recorder. The ASL Eye Vision software allows one to convert these data into a digitized video file of the driving scene as recorded from the driver's point of view with the driver's gaze locations represented by crosshairs superimposed on the video.

Two identically equipped Honda Civics were used for this study. Each had an automatic transmission with standard Honda Civic systems and displays. The vehicles were each outfitted with dual foot pedal brakes that were controlled by the driving instructor. The vehicles had a "student driver" sign on top of the vehicle.

2.5. Secondary tasks and task materials

The nine secondary tasks included a mixture of three in-vehicle tasks which involved the manipulation of controls that had an impact on the actual operating condition of the vehicle (vehicle-controls tasks) and six in-vehicle tasks which did not involve the manipulation of controls that had an impact on the operating condition of the vehicle (nonvehicle-controls tasks). The three vehicle-controls related tasks were turning the headlights on high beam, activating the front window defroster, and activating the emergency flashers. The six nonvehicle-controls tasks included looking for a compact disc (CD) in a case when it was present and when it was not present (two tasks), trying to find a street on a map when it was present and when it was not present (two tasks), taking 40 cents out of a cup holder, and tuning the radio. For the change task, ten coins were placed in the cup holder, but only one combination of coins added up to 40 cents.

2.6. Conditions of study

The study was conducted over a span of four weeks with data collection taking place on three weekends at the high school. Data collection began at 9:00 a.m. each day and concluded around 3:00 p.m. Weather and driving conditions varied naturally on these days. However, since participants from the FOCAL and placebo training groups were alternated throughout the data collection, both groups experienced virtually the same weather and driving conditions. A participant was first given the general instructions, completed the demographics form, and then went through either the FOCAL or placebo training program.

The driving course began in the high school parking lot and continued on local streets around the high school. The study staff worked with the driving school staff to select roadways that had a variety of traffic situations, but were sufficiently safe. Two of the streets were two-lane arterial roadways that had a fair amount of traffic that was separated by a double yellow line. These streets had numerous commercial driveways entering the roadway, cars parked alongside the road, and traffic lights. The remaining streets were two-lane (unmarked) neighborhood streets with very light traffic. These neighborhood streets, however, did have numerous cars parked alongside them, numerous residential driveways, and some stop signs. All turns were right-hand turns, and some roadways were traveled on multiple times with different tasks being completed each time.

The experimenter performing the eye calibration and test drive was not told if the participant was in the FOCAL or placebo training group. Once the driver adjusted the seat and mirrors and put on his or her seat belt, the eye tracker was put on and adjusted to a comfortable wearing position. The eye tracker was then calibrated per the manufacturer's instructions. If a participant moved during calibration, or if the glasses slipped, the calibration process had to be completed again. The calibration process took 5-15 minutes.

After the eye tracker was calibrated, the experimenter sat in the back seat of the vehicle. The driving instructor was seated in the front passenger seat and could activate the dual brake system or take the wheel if necessary. The participant was reminded that all driving instructions would be given by the driving instructor and all secondary task instructions would come from the experimenter in the back seat. The experimenter then explained that the tasks may involve any of the vehicle system controls, the radio, or the materials (CD case, map, or coins) on the center console between the driver and instructor. The participant was instructed to attempt to complete the tasks while driving safely. Once the participant indicated that he or she understood the instructions, the drive began. The two practice tasks were conducted as the participant drove out of the high school's parking lot. The remaining nine tasks were completed on active roadways. The tasks were started immediately after the participant completed a turn or accelerated after braking at a stop sign unless there was a reason to delay the task (e.g., oncoming vehicles in the path of the study vehicle). Each task was completed on a designated street, and all participants completed tasks in the same order and on the same streets. When on the residential roads, the driving instructor asked the participant to drive no more than 17 miles per hour. The actual time allotted to each task varied by participant since some participants would complete a task very quickly while others never completed the same task. Generally, the experimenter allowed a participant about 20 seconds to try to complete a task. If the participant did not successfully complete the task in the allotted time, the experimenter instructed him or her to stop trying. The experimenter recorded task success or failure. A task was recorded as a failure if the participant ran out of time or attempted the task but performed it incorrectly, but as indicated earlier, two of the tasks could not be successfully completed since the items being searched for were not present. The participants took about 15 minutes to complete the drives.

2.7. Dependent variables

Various measures were computed from the driver's pattern of eye movements that were scored on a frame-by-frame basis from the eye-tracker video data (30 Hz). As noted above, the video output of the eye-tracker contains crosshairs superimposed on a view of the driver's forward view, with the crosshairs representing the driver's point of gaze (fixation point) on the forward view. However, the primary coding was of the locations and durations of glances. More specifically, a glance was coded as either being *on road* or *off road*. A glance is defined as a series of successive fixations that are either on road or off road. Our analysis below will almost completely focus on the duration of off road glances as the measure of inattention to the forward roadway. The motivation for using the glance as the unit of analysis, rather than the duration of individual fixations, is that the total time the driver spends looking away from the forward roadway has been shown to be a critical determinant of crashes. Audio was recorded on the eye tracking videos, allowing the scorer to hear when the participant was instructed to begin and end a secondary task. While the participant was performing the task, the scorer recorded the time stamp for the video frame each time the participant's point of gaze transitioned from either on road to off road or vice versa. A transition was recorded any time the participant's point of gaze crossed the boundary between the test vehicle's windshield and dashboard. (During the period of interest, i.e., while the secondary task was being performed, the drivers did not look up at the rear view mirror so the classification of such fixations as on road or off road was not necessary.) In addition, the only parts of the drive that were analyzed for eye movement behavior were those parts which corresponded to the nine scenarios described above. As a result, the scenario was an important unit of analysis as well. The scorer was also "blind" to whether the driver being scored was in the FOCAL or placebo group.

3. Results

We first report the scores of the FOCAL and placebo groups on the AMAP pretest and posttest. Next, we report an analysis of the effects of training on in-vehicle glances during the on-road test drive, differentiating between scenario types (vehicle-controls and nonvehicle-controls). Finally, we discuss the on-road glances. When discussing the results there are several thresholds that we could have reported. We chose to stay with thresholds 2 s or above because it is only here that there is strong epidemiological evidence of the effect on crash rates of especially long glances inside the vehicle (Klauer et al., 2006)

3.1. AMAP pretest and posttest

We analyzed participants' performance on AMAP before training (the AMAP pretest; Table 2, top panel). The group given FOCAL training actually performed slightly worse on the AMAP pretest than the group given placebo training (e.g., the group given FOCAL training 'glanced' at least 2 s away from the forward roadway in 76.0% of the map tasks whereas the group given placebo training 'glanced' at least 2 s away from the forward roadway in only 71.4% of the map tasks). However, there were no significant differences between the two groups at each of the thresholds analyzed. Thus, there is no evidence that the FOCAL training group was intrinsically less willing to look away from the forward roadway for long periods of time than was the placebo training group.

We also analyzed drivers' performance on AMAP after training. Our primary index of the effect of training was the mean difference between the AMAP posttest and pretest scores for the FOCAL and placebo groups (see Table 2, bottom panel). The difference between the FOCAL posttest-pretest difference and the placebo posttest-pretest difference at each of the three threshold values considered, 2 s, 2.5 s and 3 s, was positive and significant. Thus, as measured by the AMAP instrument, the reduction in the proportion of glances away from

the forward roadway after training was much greater for participants in the FOCAL training group than for participants in the placebo training group.

3.2. In-vehicle glances: Analysis of differences among scenario types

Although all the tasks in the current experiment were in-vehicle tasks, it made sense to determine whether there was a difference between the eye behaviors of drivers in the three vehicle-controls scenarios and the eye behaviors of drivers in the six nonvehicle-controls scenarios due to the different task functions, task locations, and criticalities drivers might attach to these different functions in the two sets of scenarios. For instance, research by Dukic et al (2005) points to the important role that task location can have on eyes off road time. Specifically, they found differences in eyes off road time for different eccentricities between the normal forward line of sight and an in-vehicle button, with larger eccentricities generally increasing eyes off road time, but not for all eccentricities.

In addition, there is an a-priori distinction between the two sets of tasks that is similar to that between the in-vehicle and out-of-vehicle tasks in the Chan et al. (2010) study. That is, in the three vehicle-controls tasks (“find the control for the high beams”, “find the control for the defroster” and “find the four way flasher”) the driver's gaze is generally not far off the roadway as it is somewhere on the instrument panel (similar to the out-of-vehicle tasks in Chan et al.). As a result, drivers may often conclude that they are adequately monitoring the roadway in front of them while performing these tasks. In contrast, for the other six nonvehicle-controls tasks (e.g., find a CD on the front seat), it is very unlikely that drivers would be making such an assumption (similar to the in-vehicle tasks in Chan et al.).

If drivers in the vehicle-controls scenarios do believe that they are adequately monitoring the forward roadway, but those in the nonvehicle-controls scenarios do not believe that such is the case, then one would expect drivers in the vehicle-controls scenarios to be willing to look inside the vehicle during any one glance longer than drivers in the nonvehicle-controls scenarios. A reasonable measure of how much people were trying to limit the duration of individual glances is the ratio of the maximum off-road glance time during a scenario to the total off-road glance time during the same scenario. That is, if people are not trying to alternate attention during a scenario between the in-vehicle task and the forward roadway, then the ratio would be larger, but if they were trying to limit the durations of individual glances, then the ratio would be smaller².

As can be seen in Table 3, there is quite a clear distinction between the first three vehicle-controls scenarios and the other six nonvehicle-controls scenarios on this ratio measure for both groups. That is, for each group, the ratio is generally above 0.5 for the first set of vehicle-controls scenarios whereas it is about 0.3 for each of the other six nonvehicle-controls scenarios. Note that the ratios in the Table 3 were computed by taking the ratio for each participant in each scenario and then computing the averages of these ratios over participants in a group for each scenario. To assess the reliability of this distinction between the two sets of scenarios, we computed the average ratio for each participant over each of the two sets of scenarios and then computed the reliability of the difference between the two sets of scenarios across participants. In this analysis, the average ratio for the group of three vehicle-controls scenarios was 0.545 for the FOCAL group and 0.550 for the placebo group, whereas the average ratio for the group of six nonvehicle-controls scenarios was 0.313 for the FOCAL group and 0.319 for the placebo group. Obviously, there was no effect of group on these ratios nor was there any interaction between group and the type of scenario ($F_s < 1$).

²In the limit, if there was no attempt to limit the duration of an off-road glance, the ratio would be 1.

Most importantly, the 0.231 difference between the two sets of scenarios (averaged over group) was highly reliable, $F(1,35) = 37.65$, $p < .001$.

As a result of this analysis, it was decided that the most reliable estimate of the effect of FOCAL training was to concentrate on the six nonvehicle-controls scenarios that could truly be viewed as subjectively in-vehicle. Since our prior study (Chan et al., 2010) had shown that many years of driving had not taught experienced drivers to apportion glances in out-of-vehicle tasks, we thought that we would be reducing the power of our analyses by including scenarios that were plausibly like out-of-vehicle tasks to many participants. However, both separate analyses of the two sets and then an overall analysis are included.

3.3. In-vehicle glances: Analysis of effects of training

As indicated in the introduction, especially long glances above a threshold value of two seconds inside the vehicle have ecological validity in terms of predicting increased crash rates, both in the field (Klauer et al., 2006) and on a driving simulator (Horrey and Wickens, 2007). Several different ways of capturing the effect of especially long glances on behavior have been used. First, we use as our primary measures two that can be compared across experiments regardless of the number of scenarios which appear in the experiment. These include the percentage of scenarios in which at least one glance was greater than the threshold and the percentage of glances which were greater than the threshold. The former measure was computed as in Chan et al. (2010). Chan et al. (2010) used the individual scenario as the unit of analysis. Their measure was the percentage of participants who had at least one glance that was greater than the threshold value in each scenario and they then averaged these percentages across their five in-vehicle scenarios. The latter measure again used the scenario as the unit of analysis. It was obtained by computing for each participant the percentage of glances greater than the threshold value in each scenario and averaging across scenarios. The measure was then then averaged across participants.

We also report four measures which, although they will vary from experiment to experiment (assuming that the number and nature of the in-vehicle tasks are not identical), are critical for an understanding of the effects of training: (a) the average maximum glance duration in a scenario; (b) the average number of glances inside the vehicle for both the FOCAL and placebo trained groups; (c) the total number of glances greater than the threshold value in the FOCAL and placebo trained groups; and (d) a comparison of the number of participants in the FOCAL and placebo trained groups whose maximum glance at all (or most) scenarios is under the threshold value.

First, consider the percentage of scenarios in which the participants looked away at least once for more than the threshold values of 2 seconds, 2.5 seconds and 3 seconds. This is equivalent to the percentage of scenarios in which the maximum glance was greater than the threshold value and so we consider as well here the average maximum glance per scenario. Again, these averages, as in all the other analyses in this section, are over the six nonvehicle-controls scenarios that have been grouped as true in-vehicle tasks (the nonvehicle-controls tasks in the six right-hand columns of Table 3). As can be seen in Table 4, the FOCAL training produced a significant effect on three of the four measures reported. The average maximum glance duration in a scenario was over a half a second longer for the placebo group than for the FOCAL-trained group. Perhaps more importantly, however, the FOCAL training reduced the percent of scenarios in which the maximum glance was greater than 2 s, 2.5 s, and 3 s, each by more than 10 percentage points and one by almost 20 percentage points. Moreover, for the former two differences, the main effect of group was significant.

As the gender distribution wasn't exactly the same for the two groups, analyses were conducted in which gender was an explicit factor. The differences between training groups,

and the F -values in these analyses were virtually the same as in the main analysis. (Women were, on average, actually taking slightly longer glances than men.)

Our other measure that does not change as a function of the number of scenarios is the percent of off-road glances which were greater than the three threshold values above. As the data in Table 5 indicate, the pattern of data is qualitatively the same as in Table 4, but by the logic of the measures, the absolute numbers are lower than in Table 4. As can be seen, the significance levels are less than in Table 4; however, the main effect of group at 2 seconds, which has the most support as an ecological indicator, is significant. What seems to be of note about the data in Table 5, however, is the ratios of the percentages for the two groups. By this measure, the FOCAL training has reduced the percent of long glances (defined at each of the three threshold values) by about a third.

The effect of FOCAL training on the percentage of *vehicle-controls* scenarios in which drivers looked away at least once for more than 2.0, 2.5, and 3.0 seconds was similar to the effect of training in the scenarios above (the *nonvehicle-controls* scenarios), but as expected, it was weaker (see Table 6). Only the results for the percentage of scenarios with at least one glance duration that was greater than threshold are presented. The pattern was similar for the percentage of glances greater than threshold (with the percentage for FOCAL group being lower than that for the placebo group for all three thresholds), but the F -values were even smaller than those reported in Table 6. As can be seen, there are differences between the groups on all thresholds, but none of the differences are significant. This is partly because the effects are somewhat smaller and the tests are less powerful since there are only three scenarios instead of six. This pattern is consistent with some of the participants viewing these tasks as out-of-vehicle tasks and others viewing them as in-vehicle tasks as was reported by Chan et al (2010).

As predicted earlier, these scenarios added more noise than signal to the data. Thus, when the analysis comparable to that in Tables 4 and 6 was done over all nine scenarios, the effects were less reliable than the ones presented in Table 4. The difference between groups on the average maximum duration (2.512 s vs. 2.931 s) and the difference in percentage of scenarios for which the maximum glance was above the 2.5 s threshold (42.8% vs. 58.1%) were both significant, $F(1,35) = 4.418, 4.623, p < .05$, respectively, but the difference between groups on the percentage of scenarios for which the maximum glance was above the 2 s (60.3% vs. 71.7%) and 3 s thresholds (17.5% vs. 29.0%) were not significant, $F(1, 35) = 3.211, 3.010$, respectively, $p < .10$.

Finally, consider the remaining three measures that do vary as a function of the number of scenarios in the experiment – but are nevertheless important to consider because they have something important to say about the effects of training (recall that one of these measures, the average maximum glance duration inside the vehicle, has already been reported). First, the average number of glances inside the vehicle for the FOCAL and placebo groups were 5.431 and 5.491, respectively. These values were not significantly different ($F < 1$). Thus, the FOCAL training was reducing the duration of especially long glances inside the vehicle while not increasing the total number of in-vehicle glances.

This is consistent with the difference in the absolute number of long glances inside the vehicle in the FOCAL and placebo groups. These numbers are presented in Table 7. In all cases the total number of glances longer than the threshold value is smaller in the FOCAL trained group than it is in the placebo trained group. For example, in total the FOCAL trained group had on average 8.9 glances greater than 2 s whereas the placebo trained group had on average 11.5 glances greater than 2 s. The differences, although all in the right direction, did not reach significance.

Finally, with respect to the effect of training on the distribution of the glance durations of novice drivers, there were large individual differences in both groups. Specifically, the best three performing of the placebo group participants had maximum glances of less than 2 seconds in over half the nine scenarios. By contrast the three worst performing of the FOCAL group had maximum glances of less than 2 seconds in only one of the nine scenarios.

3.4. On-road glances: Analysis of differences in distribution of glance durations

We also analyzed the number of short on-road glances for the FOCAL and placebo trained groups at various thresholds (Table 8). Glances less than 0.25 s and 0.50 s might be considered so short that the driver could not process safety critical information such as the presence of a slowing vehicle or the potential threat posed by a pedestrian crossing a marked midblock crosswalk that is obscured by a vehicle stopped in the parking lane. Changes in motion can require as much as 1000 ms to detect (Johnson and Leibowitz, 1976). Much the same time would be required to make the fixations needed to anticipate a complex hazard (roughly 2-4 fixations). There were slightly fewer such short glances in the FOCAL trained group than in the placebo trained group for both duration thresholds, but the differences were not significant, $t(35) = 1.122$, $p > .20$, $t < 1$). Moreover the average number of extremely short glances per scenario was less than one in the FOCAL trained group.

4. Discussion

As indicated above, a significant cause of crashes and a significant cause of increased crash rates for novice drivers is inattention to the forward roadway, usually a function of attending to a driving-irrelevant activity. The present experiment demonstrates that the FOCAL training program significantly reduces the percentage of scenarios in which novice drivers make long glances away from the roadway when drivers are engaged in such driving-irrelevant in-vehicle activity. For example, the placebo trained drivers glanced longer than 2.5 s inside the vehicle in 60.2% of the scenarios whereas the FOCAL trained drivers glanced over this threshold in only 41.9% of the scenarios, a difference of 18.3 percentage points. Perhaps more to the point, the percentage of scenarios in which long glances were made was reduced by about one-third for all three threshold values (2, 2.5, and 3 seconds).

There could have been unintended consequences of the training which would have weakened the case for training. For example, the average maximum glance away from the forward roadway could have been longer in the FOCAL trained group. Or the total number of glances inside the vehicle longer than any one of the three threshold values could have been greater for the FOCAL trained group. But neither of these unintended consequences came to pass.

Also of concern is the issue of overconfidence. An unintended consequence of training drivers to limit their glances to under two seconds may be that they then believe they can safely glance away from the forward roadway as long as that glance is less than two seconds. Thus, they might now perform a large number of in-vehicle tasks which heretofore they had not performed because they did not feel it was safe. We did not gather the data necessary to make this determination in the above study. However, we were aware that it was an issue and so the instructions specifically emphasized the fact that glances away from the forward roadway, except for safety-critical tasks, actually increased a driver's risk of crashing. Having said this, the fact that there do exist safety-critical tasks which require glances away from the forward roadway makes training an imperative, assuming that there are net benefits of doing such.

Finally, we should speak to a critical issue that was mentioned only in passing in the discussion of the results and could also have unintended, negative consequences. Specifically, nothing was done to control the duration of the glances on the forward roadway. It is not unreasonable to expect that if drivers took shorter glances away from the forward roadway they would also take much shorter glances on the forward roadway. The reasoning is as follows. A long glance away from the forward roadway lets a driver consolidate material in short term memory. A very short glance may not. Thus, the driver taking a short glance away from the forward roadway might have looked back at the forward roadway for only a very short period of time in order more easily to consolidate information in short term memory. As it turned out this was not the case. If anything, the FOCAL trained drivers made slightly fewer short glances on the forward roadway than did the placebo trained drivers. In summary, we believe that it is worth examining whether FOCAL has a significant effect in a larger study on a driving simulator or in the field, more likely the former given the control and safety issues, and given recent research findings indicating that visual behavior in driving simulation is similar to that in the field when assessing differences in in-vehicle interfaces (Wang et al, 2010).

Regarding the large individual differences, three of the placebo group participants had maximum glances of less than 2 seconds in over half of the nine scenarios, whereas three of the FOCAL group participants had maximum glances of less than 2 seconds in only one of the nine scenarios (and apparently had learned nothing from the training). Ideally, all FOCAL participants should have had maximum glances of less than two seconds in all nine scenarios. However, perhaps we are expecting too much of a training program that takes less than an hour to have an effect on everyone.

This raises the question of how big an effect one can reasonably expect to get from a training program such as FOCAL. One possible benchmark is the difference between novice drivers and more experienced drivers. As indicated earlier, in two previous studies, there were sizeable differences between experienced and inexperienced drivers for the 2.5 s threshold. The Wikman et al. (1998) on-road study found a 33 percentage point difference between experienced and novice drivers in the percentage of drivers with glances greater than 2.5 s: 46% of the inexperienced drivers had a glance greater than 2.5 s whereas only 13% of the for experienced drivers had glances greater than 2.5 s. However, it is hard to compare our results to the Wikman et al. study for two reasons. First, their unit of analysis was the percentage of participants, not the percentage of scenarios. Their measure, the percentage of participants over threshold, will vary with the number and length of in-vehicle scenarios whereas the one we report will not – which is why we chose it. Moreover, their definition of ‘in-vehicle glance duration’ was somewhat different. That is, if the driver looked at two or more locations within the vehicle during an episode when their eyes were off the road, these were apparently counted as separate glances. In contrast, in both the present experiment and Chan et al. (2010), an ‘in-vehicle glance duration’ was the entire time between when the driver's eyes left the road and returned to the road.

The Chan et al. (2010) simulator study thus seems like a better benchmark against which to compare the effects of the current training study. As indicated earlier, Chan et al. obtained a difference of 35 percentage points between experienced and novice drivers in the percentage of scenarios with glances over 2.5 s (45% vs. 10%). Given the relatively young average age of the experienced cohort in the Chan et al. study (23.9 years with at least five years of driving experience), one might expect even bigger differences with more experienced drivers. By comparison, our difference at this threshold (18%) was smaller than the Chan et al. (2010) difference. However, just as we noted above that one can't necessarily expect a few minutes of training to impact everyone, one can't necessarily expect such a short period of training to duplicate the effect of years of experience on the road. Interestingly, the

absolute values of percentage of scenarios with long glances for the placebo trained participants are higher in the present study (60% in this study vs. 45% in the Chan et al., 2010 study), but it's somewhat hazardous to compare these across experiments as the in-vehicle tasks selected weren't the same and the road conditions in the present study may have seemed safer than in the Chan et al. (2010) study and may have led participants to be slightly more willing to take risks.

A driving simulator study is currently underway using many of the scenarios used in Chan et al. (2010) which may allow a better comparison of the effects of FOCAL training to those of years of experience in driving. This is because the novice drivers can navigate the vehicle in the simulator without a driving instructor in the front seat. The driving instructor might actually make the novice drivers more willing to take long glances away from the forward roadway on the open road because the novice drivers know that the driving instructor is paying close attention to the road ahead.

It should be mentioned here that it is our opinion that one could well develop a more detailed categorization of in-vehicle tasks than the binary one we proposed. In fact, it is likely that the pattern of eye movements is some complex combination of the relevance of an in-vehicle task to driving, the task function, the location of the task inside the vehicle and the cognitive load. However, this is better the province of future studies than the concern of the current study.

While the improvements in the novice drivers' eye glance behavior are evident immediately after training regardless of how brief the training was, it is also of interest to know whether these improvements will indeed persist over time. Olsen et al. (2007) found that 6 months of driving experience for novice drivers did not decrease their *Eyes Off Road* time (EOR) while performing secondary tasks in a test track study. If six months of driving experience do not decrease the EOR time, one can assume that the metric used in this research (i.e., percentage of scenarios with maximum glance over a threshold) will not improve in six months either. Thus it is of interest to know if the positive effects of FOCAL will persist so as to make up for the slower pace of improvement as a consequence of experience. There is past evidence that improvements from similarly designed hazard anticipation training have persisted over time (Pradhan et al., 2006) thus paving the path towards future work to evaluate the duration of the effects found in this research.

Finally, one might ask whether the effect of related training targeted at novice drivers might generalize to attention maintenance. For example, one might reasonably argue that training novice drivers to scan the road ahead more closely, either for specific hazards (Pradhan et al., 2009a) or for more general hazards (Underwood et al., 2002, 2003), would alert such drivers to the importance of keeping glances inside the vehicle relatively short. But, curiously, there appears to be no effect of such training on the duration of in-vehicle glances, at least when the training is focused on hazard anticipation (Pradhan et al., 2009b, 2010).

In sum, the present data indicate that FOCAL is a promising program for training novice drivers to reduce long off-road glances, which is a significant cause of increased crashes for this group. Indeed, as indicated above, the reduction of the percentage of scenarios in which there was a glance greater than 2.5 seconds was two-thirds of the difference between experienced and novice drivers in two prior studies. As argued above, it is difficult to compare across the studies, but the data are consistent with the hypothesis that FOCAL can significantly reduce the difference between inexperienced and experienced drivers in their tendency to make long off-road glances. While one might argue that it is never safe to make a glance inside the vehicle, this is simply not the case. A safe driver must constantly glance away from the forward roadway in order to gauge speed, to determine the presence of

vehicles in the rear and side view mirrors, and to operate the defroster, the emergency flashers and the windshield wipers, among others. Not training novice drivers how to distribute attention in these tasks could be a mistake, perhaps a deadly one.

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Statement of relevance

Distracted driving is increasingly a problem as cell phones, navigation systems and other in-vehicle devices are introduced into the cabin of the automobile. A training program is described that has been tested on the open road and can reduce the behaviors that lead to crashes caused by distracted driving.

Figure 1. Forward View (top panel), Map View (bottom panel)

Table 1
Component Modules of Training: Pretest (AMAP), Training (FOCAL), Posttest (AMAP).
(Full description in discussion of training modules. Glances away refer to glances at map)

Program	Module	Submodules and Content
AMAP	Pretest	Four video clips
FOCAL	1. Feedback	The one video clip from pretest with longest glance away was replayed with all glances away blacked out
	2. Timer	The one video clip from pretest with longest glance away was replayed with timer displayed when glances away blacked out
	3. Three Second In-Vehicle Glance Training	Three video clips with glances away terminated at three seconds
		Four video clips where participant determines duration of glances away
	4. Two Second In-Vehicle Glance Training	Three video clips with glances away terminated at two seconds
		Four video clips where participant determines duration of glances away
AMAP	Posttest	Four video clips

Table 2
AMAP Pretest (top panel) and AMAP Pretest – Posttest Differences (bottom panel)

AMAP Pretest Scores			
	Proportion of “Glances” greater than threshold ^a		
	> 2s	> 2.5s	> 3s
FOCAL Mean	0.760	0.636	0.557
Placebo Mean	0.714	0.620	0.502
Difference	0.046	0.016	0.055
SE	0.055	0.074	0.084
t	0.833	0.222	0.657
p	0.410	0.826	0.515

AMAP Posttest Pretest Score Differences			
	Proportion of “Glances” greater than threshold ^a		
	> 2s	> 2.5s	> 3s
FOCAL Mean Difference	0.663	0.576	0.513
Placebo Mean Difference	-0.101	-0.068	-0.058
Difference	0.765	0.644	0.571
SE	0.062	0.075	0.070
t	12.313	8.534	8.043
p	0.000	0.000	0.000

^aA “glance” here is the time between when a key press makes the map visible until the next key press makes the roadway visible.

Table 3
Maximum Off-Road Glance Durations, Total Off-Road Glance Durations, and the Ratio Between them

	Vehicle Control Scenarios			Nonvehicle Control Scenarios					
	Find High Beams	Find Front Def.	Find Emerg. Flashers	Find CD 1	Map Task 1	Find Radio Station	Map Task 2	Find CD 2	Find Correct Change
FOCAL Group									
AVG Total Time [/]	4.87	6.87	4.22	8.16	7.49	10.42	10.62	6.82	8.94
AVG Max Time [/]	1.87	3.26	2.26	2.10	2.44	3.08	3.27	2.05	2.22
Average Ratio	0.47	0.50	0.66	0.29	0.34	0.32	0.32	0.33	0.28
Placebo Group									
AVG Total Time [/]	3.59	7.94	5.61	9.35	9.87	12.53	11.21	8.44	7.84
AVG Max Time [/]	1.66	3.75	2.64	2.81	2.93	4.15	3.63	2.50	2.02
Average Ratio	0.52	0.55	0.58	0.33	0.31	0.34	0.34	0.30	0.27

[/]Times are in seconds.

Table 4
Average Maximum Off-Road Glance Duration per Scenario and the Percentage of
Scenarios in which Maximum Off-Road Glances are over 2 s, 2.5 s, & 3 s for the
***Nonvehicle-Controls* Scenarios in Table 3**

Group	Average Max Glance per Scenario	Percent of Scenarios in which Maximum Glance is		
		> 2 sec	> 2.5 sec	> 3 sec
FOCAL	2.531 ^{<i>I</i>}	59.5%	41.9%	30.2%
Placebo	3.069 ^{<i>I</i>}	75.9%	60.2%	41.7%
Placebo – Focal	0.538 ^{<i>I</i>}	16.5%	18.3%	11.5%
SE	0.228	7.2%	8.1%	7.9%
F(1, 35)	5.560	5.194	5.139	2.120
p	0.024	0.029	0.030	0.154

^{*I*}Times are in seconds.

Table 5
The Average Percentage of Off-Road Glances that are over 2 s, 2.5 s, and 3 s for the
***Nonvehicle-Controls* Scenarios in Table 3**

Group	Percent of Glances that are		
	> 2 sec	> 2.5 sec	> 3 sec
FOCAL	19.5%	12.8%	7.7%
Placebo	28.8%	19.0%	12.3%
Placebo minus FOCAL	9.4%	6.2%	4.6%
SE	4.4%	3.4%	2.7%
F(1, 35)	4.567	3.240	2.866
p	0.040	0.080	0.099

Table 6
Average Maximum Off-Road Glance Duration per Scenario and the Percentage of
Scenarios in which Maximum Off-Road Glances are over 2 s, 2.5 s, & 3 s for the *Vehicle-*
***Controls* Scenarios in Table 3**

Group	Average Max Glance per Scenario	Percent of Scenarios in which Maximum Glance is		
		> 2 sec	> 2.5 sec	> 3 sec
FOCAL	2.422 ^{<i>l</i>}	59.6%	42.1%	24.6%
Placebo	2.674 ^{<i>l</i>}	63.9%	54.6%	38.9%
Placebo – Focal	0.252 ^{<i>l</i>}	4.2%	12.5%	14.3%
SE	0.235	9.2%	9.7%	8.7%
F(1, 35)	1.147	0.214	1.667	2.726
p	0.292	0.646	0.205	0.108

^{*l*}Times are in seconds.

Table 7
The Total Number of Off-Road Glances that are over 2 s, 2.5 s, and 3 s for all Scenarios in Table 3

Group	Number of Glances that are		
	> 2 sec	> 2.5 sec	> 3 sec
FOCAL	8.934	5.664	3.283
Placebo	11.544	7.222	4.411
Placebo minus FOCAL	2.610	1.558	1.128
SE	1.335	1.117	0.777
F(1, 35)	3.826	1.943	2.105
p	0.059	0.172	0.156

Table 8
Average Number of Scenarios in which an On-road Glance is less than 0.25 s and 0.50 s

Group	Average Number of Scenarios in which there is an On-road Glance	
	< 0.25 sec	< 0.50 sec
FOCAL	0.79	5.68
Placebo	1.67	6.67
Placebo – Focal	0.98	0.88
SE	1.42	0.71
F(1, 35)	0.479	1.555
p	0.493	0.220