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How Cognitive Distraction Affects Motorway Short-term Work Zone Safety along Curves: A Driving Simulation Study

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Abstract. This study investigates how cognitive distraction affects driver behaviour on a two-lane motorway reduced to one lane (the left) in a short-term work zone along a left-hand curve. Forty-two participants were divided into two groups: undistracted and cognitively distracted drivers – with the latter required to perform mental calculations. Drivers had to react to the sudden and unexpected appearance of stationary vehicles in a queue. Distracted drivers started braking at higher speeds and released the accelerator later than undistracted ones. Their reaction times were significantly longer, and five of them could not avoid a collision with the last vehicle in the queue. Heat maps of eye fixations show that distracted drivers focused their gaze on a few elements of the road section, predominantly on the inside of the carriageway, while undistracted drivers looked at a wider area of the road scenario. Distracted drivers exhibited delayed responses to unexpected events, highlighting the importance of addressing cognitive distraction in road work zones. Given the high frequency of roadworks on motorways, specific safety countermeasures are needed to compensate for the objective risk posed by unexpected events in scenarios where distracted drivers operate with limited available sight distance.

Keywords: cognitive distraction; short-term work zone; safety; available sight distance; driving simulation; gaze analysis.

Introduction

Even though they accommodate a considerable volume of traffic including a wide variety of vehicles like cars, lorries, buses, etc. (Romanowska *et al.*, 2019), motorways guarantee higher safety standards than other types of roads (Albalate & Bel, 2012; Elvik, 2010). They are high-capacity roads designed for fast-moving traffic, with smooth curves, low grades, unidirectional carriageways, multiple lanes, controlled accesses, and built and maintained with high-quality materials, with the aim of reducing crash risks compared to rural or urban roads. In 2022, the number of fatalities on motorways (9.1%) was lower than on urban (38.2%) and rural roads (52.7%) in Europe (Eurostat, 2024).

Given the high safety, the comfort requirements and the age of the motorway network in many countries, roadworks on motorways are frequent (European Commission, 2019; Walker & Calvert, 2015; World Road Association, 2014). The resulting work zones cause traffic instability due to temporary lane width reduction, the imposition of shoulder restrictions, the closure of one or more lanes (Bakaba & Ortlepp, 2016; Rashid *et al.*, 2019; Yousif *et al.*, 2017), and a reduction in the available sight distance (Vignali *et al.*, 2019). Several studies have shown that the incidence and severity of road crashes increase in construction work zones (Khattak *et al.*, 2002; Li & Bai, 2008; Theofilatos *et al.*, 2017; Wang *et al.* 2024), with a notable increase in rear-end collisions (Meng & Weng, 2011; Zheng *et al.*, 2010). When motorways are not congested, the driving task is relatively simple, and the driver's mental workload is usually low (Patten *et al.*, 2004; Tejero & Choliz, 2002). In contrast, when approaching work zones, drivers must make complex decisions to adjust speed and lane position, often resulting in potential conflicts between vehicle paths (La Torre *et al.*, 2017; Shahin *et al.*, 2023, Shakouri *et al.*, 2014). In these circumstances, the driver's mental workload increases and any distraction from the driving task could lead to a collision (Valdés-Díaz *et al.*, 2021; Yang *et al.*, 2023).

Distracted driving is one of the most influential factors in road safety, and the number of crashes resulting from distraction is increasing worldwide (Sajid Hasan *et al.*, 2022). When drivers divert their attention from the driving task to competing activities, driving performance deteriorates and the risk of a crash increases (Choudhary *et al.*, 2020; Horberry *et al.*, 2006; Regan *et al.*, 2011). Klauer *et al.* (2006) found that almost 80% of crashes and 65% of near-crash events were preceded by driver inattention. Mobile phone use and texting while driving are currently the most common sources of driving distraction, and involve the simultaneous performance of visual, physical, and cognitive secondary tasks (Lipovac *et al.*, 2017; Valdes *et al.*, 2019; World Health Organization, 2011).

Physiological measures play a crucial role in understanding driving behaviour (de Waard, 1996), even under distracted conditions. Eye-tracking is used to detect eye movements and determine where drivers focus their attention on the road. Cognitive distraction is known to affect gaze behaviour and the ability to focus on critical elements of the driving environment (Itoh *et al.*, 2006; Marquart *et al.*, 2015). Measures like gaze duration, fixation locations, blink rates and saccadic movements can be employed to interpret drivers' visual patterns and cognitive processes while driving (Niezgoda *et al.*, 2015; Savage *et al.*, 2020; Yahoodik *et al.*, 2020; Yang *et al.*, 2018). The performance of relevant cognitive tasks leads to an increase in blink rates (Recrate *et al.*, 2008). Kummetha *et al.* (2020) demonstrated that changes in mental workload and situational awareness led to variations in longitudinal control and gaze behaviour. The average speed decreased as the mental workload increased, and the standard deviation of horizontal gaze position was observed to decrease as the mental workload increased.

As roads age, the frequency of work zones for maintenance and upgrades inevitably increases. Silverstein *et al.* (2016) analysed a dataset with detailed information on fatal collisions in the United States and found that distracted driving significantly contributes to the risk of crashes in work zones, specifically rear-end and sideswipe collisions. Since cognitive factors play a critical role in safety-related driving behaviours in work-zone areas (Rangaswamy *et al.*, 2024), it crucial to study driving distraction in this context. However, the behaviour of distracted drivers near work zones remains insufficiently explored, leaving a gap in our understanding of the implications for the safety of workers and drivers (Silveira *et al.*, 2023).

In this driving simulation study, we investigated the influence of cognitive distraction on driver behaviour along motorways in the proximity of short-term work zones. Forty-two participants were involved, divided into two groups: undistracted drivers who drove normally, and distracted drivers who had to solve simple mathematical operations in their head while driving, thus requiring them to perform a secondary cognitive (and auditory) task. The simulated scenario consisted of a two-lane motorway with a work zone located on a curved section with an available sight distance limited to 175 m. Drivers had to identify and brake before reaching a queue of vehicles in the sole available lane on this stretch of road.

Method

Experimental design and equipment

To avoid any learning effect, a between-subjects experimental design was considered, with different test drivers assigned to each scenario. The two different levels of distraction investigated included (i) undistracted (baseline) and (ii) intentionally distracted drivers. Experiments were carried out at the Road Safety and Driving Simulation (RSDS) laboratory at the Politecnico di Torino (Italy) by using a fixed-base driving simulator (AV Simulation, CDS 650) equipped with SCANeRStudio® software (Figure 1). Three 32-inch full HD screens (1920 × 1080 pixels each) guaranteed a field of view of 130° horizontally and 30° vertically. The simulator hardware included a cockpit with a force feedback steering wheel and pedals, gearbox, and dashboard. To ensure a realistic driving scenario, environmental and vehicular sound effects were generated and emitted by five speakers located behind the screens and a subwoofer under the driver's seat. The driving simulator has been validated for both longitudinal and lateral driving behaviour (Bassani *et al.*, 2018; Catani & Bassani, 2019). An eye-tracking system was used to study the drivers' gaze behaviour during the experiment (Figure 1). This device had two internal cameras positioned close to the user's eyes and an external front camera. This setup allowed the system to capture eye movements with accuracy and detail and ensured minimal interference with the driver's field of view.

[Figure 1 near here]

Road scenario, participants, and experimental protocol

Distraction is more likely to occur when the simplicity of the driving task and the monotony of the road cause the driver to reduce attention to the primary task (Farahmand & Boroujerdian, 2018; Zhao & Rong, 2012). Hence, a motorway scenario was developed with two 4 km tangents connected by a curve (1200 m in radius, 2000 m in length). The cross-section was 25 m wide, with two lanes (3.75 m in width) in each travelled way and a 3 m wide emergency lane, according to category A of the Italian technical standards (Ministero delle Infrastrutture e dei Trasporti, 2001). The posted speed limit was set at 130 km/h along straights and 110 km/h along curves and indicated through vertical signs. Horizontal markings and vertical signs were designed in accordance with the Italian Highway Code specifications (Ministero delle Infrastrutture e dei Trasporti, 1992). Free-flow traffic conditions were simulated in both directions to enhance the realism of the scenario. The scenario was set to daylight weather and optimal visibility conditions. After the second tangent, a second left-hand curve with a radius of 1200 m was included. At the start of the curve, a short-term work zone was defined along the right lane. Temporary signage, including a 60 km/h speed limit and traffic cones according to Italian rules (Ministero delle Infrastrutture e dei Trasporti, 2002) was used to restrict the travelled way to a single lane, i.e., the left lane close to the median barrier (see Figure 2). By definition, a short-term work zone is a temporary area set up to accommodate construction or maintenance activities from a few hours to a few days. Because of its limited duration, it represents an unexpected event for many drivers. A few seconds after entering the restricted lane, drivers encountered stationary vehicles in a queue ahead.

Along the left lane, the presence of the median guardrail (Figure 2) restricted the available sight distance to 175 m. This distance was sufficient for drivers travelling at 60 km/h to bring their vehicle to a safe stop before the line of stationary traffic ahead. Before entering the work zone, distracted drivers started to perform a secondary task consisting of solving and answering some arithmetic operations (addition, subtraction, multiplication, and division without regrouping) and providing the solution verbally. The literature indicates that the performance of mathematical operations impairs driving performance significantly more than the distraction due to conversation (Shinar *et al.*, 2005). All test drivers were given mathematical operations of the same level of difficulty to avoid additional effects from the secondary task.

[Figure 2 near here]

Forty-two participants (Table 1) aged between 23 and 63 years (fifteen females, *M* = 43.4 y, *SD* = 12.5 y) were involved in the experiment. To capture the effect of distraction along the work zone, we established an unbalanced number of drivers in the two groups, with fourteen undistracted drivers (five females) and twenty-eight distracted drivers (ten females). None of the participants was aware of the specific hypothesis being tested during the experiment. The experiment followed the ethical guidelines of the World Medical Association (2018). The test drivers were randomly selected from a list of volunteers who had previously participated in simulation experiments to ensure that they did not suffer from simulation sickness. They all volunteered for the experiment without receiving any compensation. Participants with at least three years of driving experience were considered for this study. People with serious medical conditions or disabilities were not included.

[Table 1 near here]

The experimental protocol included a pre-drive questionnaire to collect information on each participant's driving experience, health status, and familiarity with the driving simulation. Following the pre-drive, but prior to the start of the simulation, the eye-tracker was worn and calibrated. Then, the participants were asked to drive the experimental scenario. The driving task started with a merging manoeuvre to gain access to the motorway via a direct ramp. A written message displayed on the screen announced the start of the secondary task 500 m before encountering the queue.

Data Analysis

The station where the queue ahead first came into view was considered to measure the speed (S), as well as the distance travelled to assess the extent to which cognitive distraction influences the driver's reaction to the queue (Strayer, 2015). According to Figure 3, the stopping distance (d_{Stop}), which includes the perception and reaction distance as well as the braking distance, was estimated together with the distance from the station where the queue was visible to the station where the throttle was fully released (d_{TR}), and the distance from the station where the throttle was fully released to the station where the driver started to press on the brake pedal (d_{AB}). In addition to the above distances, the average deceleration rate (D_R) was measured every 0.1 s from the point where the queue was visible to the stopping point, i.e., along the stopping distance shown in Figure 3. In the simulation, some D_R values could be significantly higher than those measured in the field under the same driving conditions. In the context of the simulation, D_R better reflects the intensity of the driver's braking effort rather than a vehicle dynamic parameter. In this study, D_R indicates how hard the driver tried to stop the vehicle before reaching the queue.

The Welch's t-test was used to compare the results between the two levels of distraction. It is a variant of the t-test used to compare the means of two independent samples when their variances and sample sizes are different. Welch's t-tests were performed using R software (R Core Team, 2024) with a significance level of .05. In addition, a gaze behaviour analysis was conducted by extracting and manipulating the raw data recorded by the eye-tracker. The number of blinks and fixations (mean and standard deviation) was assessed and compared between undistracted and distracted drivers from 500 m before the section where the queue was visible until the driver stopped the vehicle, with distracted drivers performing the secondary task. A qualitative analysis using heat maps was conducted to assess the visual patterns of the drivers and to identify trends and differences in gaze behaviour between the two groups.

[Figure 3 near here]

Results

Driving behaviour

A speed profile analysis allowed to classify the longitudinal behaviour of the drivers during braking. As shown in Figure 4, three profiles were identified:

(1) Profile 1 was followed by those who released the accelerator quickly when they reached the section where the queue was visible, and then braked just as quickly; this rapid reaction was followed by a period of slow deceleration before the vehicle came to a complete stop behind the queue;

(2) Profile 2 was followed by those who did not react quickly and, once they realised the danger, braked abruptly to avoid a collision with the vehicle in front;

(3) Profile 3 was followed by those who did not stop in time to avoid the collision.

As shown in Table 2, 12 of the 14 undistracted drivers stopped their vehicle according to Profile 1, while only 2 of them reacted late according to Profile 2. All undistracted drivers avoided a collision. In contrast, only 13 out of 28 distracted drivers followed Profile 1, 10 out of 28 followed Profile 2, and five failed to avoid a collision (Profile 3).

[Figure 4 near here]

Table 2 also shows the descriptive statistics of the dependent variables analysed for both undistracted and distracted drivers. Box plots of the data are presented in Figure 5, together with the results of Welch's t-tests. The average speed of distracted drivers at the station where they were first able to see the queue was significantly higher than the speed of undistracted drivers, $t(19) = -3.71$, $p = .001$ (Figure 5a). Among the undistracted drivers, 8 out of 14 passed that station without pressing the throttle and, together with those who did use the throttle (6 out of 14), they all released it within a shorter distance than distracted drivers (Figure 5f). The Welch's t-test showed that the difference in d_{TR} between the two groups was statistically significant, $t(38) = -3.13$, $p = .003$. However, no significant differences were found between d_{AB} averages, $t(22) = 0.26$, $p = .800$. Distracted drivers had shorter stopping distances than undistracted drivers, $t(17) = -1.61$, $p = .125$, suggesting that they had to compensate for their delayed braking response. The deceleration rate (D_R) was strongly influenced by the speed profiles shown in Figure 4, with the lowest rates for Profile 1 and the highest for Profile 3. According to Figure 5b, D_R was significantly lower for undistracted drivers than distracted ones, $t(30) = -3.65$, $p = .001$.

[Table 2 near here]

[Figure 5 near here]

Eye-tracking analysis

An analysis of the eye-tracking data is shown in Figure 6. Data recording started at the point where the distracted drivers were asked to perform the secondary task. The box plots show the number of blinks (Figure 6a) and fixations (Figure 6b) from 500 m before the section where the queue was visible, when the secondary task for distracted drivers had started. Blinks and eye fixations are both important indicators for understanding driver behaviour, but they serve different purposes. Blinks, which involve the rapid opening and closing of the eyelids, are often used to monitor alertness and fatigue (Shekari Soleimanloo *et al.*, 2019; Stern *et al.*, 1994), while fixations, defined as the act of maintaining the gaze on a specific object or area, help to evaluate visual attention and cognitive processes during driving (Crundall & Underwood, 2011), determining whether the driver is focusing on critical information. The number of blinks for distracted drivers ($M = 2.8$; $SD = 3.5$) was higher than that for undistracted ones ($M = 1.0$; $SD = 1.4$), albeit this difference was marginally significant, $t(25) = 1.96$,

p = .060). The box plots also show a wider dispersal of data for distracted drivers, although this result is somewhat distorted by the excessive blinking of only two participants. The number of fixations attributable to distracted drivers (M = 6.3, SD = 2.4) was significantly lower, $t(25) = 2.16$, p = .040, than that for undistracted drivers (M = 7.8, SD = 1.4).

[Figure 6 near here]

The heat maps shown in Figure 7 and Figure 8 are the result of a fixation point analysis and show two different types of gaze behaviour. Some drivers focused their gaze on multiple points in the scene, giving them a wider view of the road environment. Others tended to focus their gaze on a limited part of the road scene in front of them. A qualitative analysis of the distribution of fixations shows that about 80% of the undistracted drivers adopted the first type of behaviour (Figure 7). In contrast, about 77% of the distracted drivers narrowed their field of vision. About half of them focused their gaze on the inner edge of the road (Figure 8). It was therefore possible to distinguish different gaze behaviours for the two levels of distraction.

[Figure 7 near here]

[Figure 8 near here]

Discussion

This driving simulation study investigated the influence of cognitive distraction on driver behaviour on a motorway section in the presence of a short-term work zone. In particular, the case of a curved motorway section was analysed, where visibility was restricted by the presence of the median guardrail. The experiment involved forty-two participants divided into two groups. In the distracted group, cognitive distraction was induced by asking the drivers to perform simple mathematical operations. The undistracted group of drivers represented the baseline of the experiment.

There was a noticeable difference in driving behaviour between the two groups of participants. The undistracted drivers approached the section of road adjacent to the work zone at a significantly lower speed than the distracted participants. Despite being alerted by advance warning signs and being aware of the narrowing of the road, distracted drivers approached the work zone with less caution, leading five of them to make the mistake of braking too late to avoid a collision with the queue of vehicles ahead. These findings contrast with the naturalistic study of Tymvios and Oosthuysen (2016), who found no difference in speed between undistracted and distracted drivers, a fact that be partly attributed to the difference in risk perception between driving in a simulator and driving on the real road.

Undistracted drivers released their foot from the throttle earlier than distracted participants, giving them more time to reduce their speed before stopping in front of the queue. In contrast, distracted drivers exhibited delayed braking responses but shorter overall stopping distances. Cognitively distracted drivers had to compensate for their excessive speed and delay in initiating braking action by drastically reducing their speed so as to avoid a collision. However, the abrupt braking action did not always prevent the distracted participants from colliding with the last vehicle in the queue. In fact, five of them misjudged the risky situation and collided with the last vehicle in the queue. Our observations corroborate and extend the conclusions of Domenichini *et al.* (2017), as it is evident that speed remains one of the main causes of crashes in the vicinity of roadworks. However, the delayed action on the part of cognitively distracted drivers with regard to their controls could also increase the likelihood of collisions. Undistracted drivers brake earlier, giving them more space and time to gradually adjust their speed. Cognitively distracted drivers, who brake later and at shorter distances, have less time to react to unexpected events. While both categories of drivers can avoid a collision, the overall risk is lower for the undistracted driver.

Eye-tracking analysis revealed that most of distracted drivers focused their gaze on a few closely related points, in most cases towards the tangent point (Land & Lee, 1994). The dispersion of their fixation points is significantly reduced compared to that of undistracted drivers. The results obtained are in line with the findings of Itoh *et al.* (2006) regarding the effects of performing cognitive tasks on driving and gaze behaviour. The distribution of fixations among undistracted drivers was broad and can be defined as Type 1 of Itoh's classification (Itoh *et al.*, 2006). The secondary task led to a reduction in the visual field and a high concentration of fixations for the cognitively distracted drivers, which can be classified as Type 2 according to Itoh *et al.* (2006).

Distracted driving alters the visual attention. The changes in blink frequency and fixation patterns can significantly affect the driver's ability to process the information on the road. An increased number of blinks, such as those exhibited by distracted drivers (Figure 6a), reduces the amount of time the eyes are on the road, resulting in delayed detection of potentially dangerous events. Similarly, reduced fixations limit peripheral awareness and narrow the driver's field of vision. Visual information processing is impaired, leading to delayed reactions, risky manoeuvres and increased crash likelihood (Castro, 2008), especially in complex environments such as work zones.

The results highlight the significant risks associated with the presence of short-term work zones along motorways. Visibility conditions along left-hand curves limit the ability of distracted drivers to see, understand, and react to hazardous situations, such as those that occur when there is severe traffic congestion along motorway sections. This study also highlights the need to adopt specific countermeasures for short-term work zones which tend to feature the use of temporary signs (road signs and traffic cones). On sections with limited sight distance, more effective measures are needed to force cognitively distracted drivers to slow down according to the requirements of temporary signs and to warn users of the risks associated with distracted driving (Nahed *et al.*, 2023).

Considering the frequent presence of roadworks on motorways, the adoption of countermeasures to mitigate the risks associated with unforeseen events should be a priority. Our results also confirm the importance of including cognitive factors in safety design for work zones along motorways, especially in situations where visual distance is limited. However, this study and the conclusions achieved must be seen in the light of some limitations. The study considered ideal driving conditions for visibility (daytime driving and with excellent visibility) and free-flow traffic conditions. These simplifications partly limit the external validity of our results, so further studies that account for adverse visibility conditions and higher traffic levels should address our research hypothesis in a more ecological way. In addition, gender and age differences among participants may influence driving performance and the responses to unexpected events. Future research should account for these demographic variables to provide more comprehensive results.

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Disclosure of interest

The authors report there are no competing interests to declare.

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Table 1: Mean (and standard deviation) of participant traits. Notes: F = females.

Group	No. of drivers	Age (years)	Years licence held	Km driven by year (km/year)	No. of crashes
Undistracted	14 (F = 5)	43.8 (11.9)	25.1 (11.9)	14857 (10516)	1.1 (1.6)
Distracted	28 (F = 10)	43.2 (13.1)	23.4 (12.6)	13018 (11278)	1.3 (1.7)
Total	42 (F = 15)	43.4 (12.5)	24.0 (12.2)	13631 (10936)	1.2 (1.6)

Table 2: Descriptive statistics of the dependent variables (mean and standard deviation between brackets).

Groups	**Speed profile type**	**No.**	***S*** **(km/h)**	***d_{TR}*** **(m)**	***d_{AB}*** **(m)**	***d_{Stop}*** **(m)**	***D_R*** **(m/s^2)**
Undistracted	1	12	73.1 (22.2)	5.9 (10.5)	18.8 (23.5)	147.0 (22.8)	4.4 (2.3)
	2	2	106.0 (7.6)	6.3 (7.1)	4.6 (6.5)	164.0 (3.6)	11.7 (0.8)
	3	0	-	-	-	-	-
Distracted	1	13	96.2 (12.8)	9.2 (13.9)	11.8 (14.5)	157.0 (6.6)	6.9 (2.3)
	2	10	109.0 (15.3)	31.3 (24.1)	18.0 (26.8)	154.0 (11.1)	11.6 (3.8)
	3	5	113.0 (17.2)	44.3 (35.4)	17.4 (9.5)	177.0 (7.0)	13.2 (2.8)

Figure captions list:

Figure 1: The driving simulator at RSDS Laboratory and the eye-tracking system (Pupil Labs).

Figure 2: Road scenario with (a) the work zone and (b) station from which the queue ahead was visible.

Figure 3: Throttle release (d_{TR}), action on the brake (d_{AB}), and braking (d_{Stop}) distances in the stretch of curve where the queue of vehicles was visible to the driver.

Figure 4: Speed profiles of test drivers when approaching the queue of vehicles.

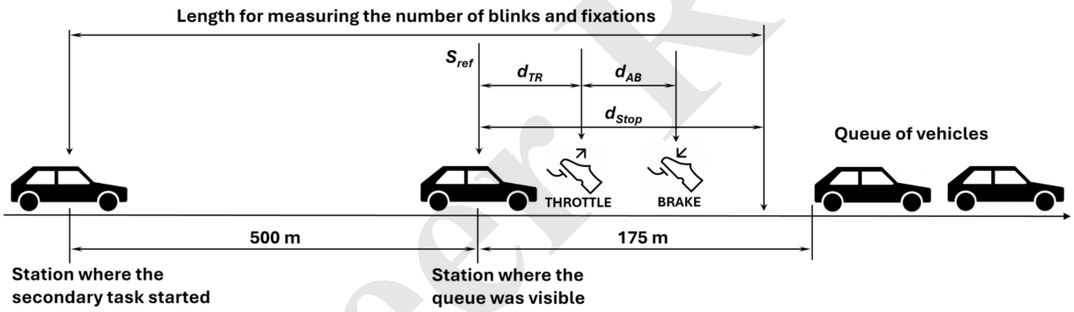
Figure 5: Box plots of the data and Welch's t-test results for (a) speed at the reference station, (b) mean deceleration, (c) the throttle release distance, (d) the brake action distance, and (e) the stopping distance.

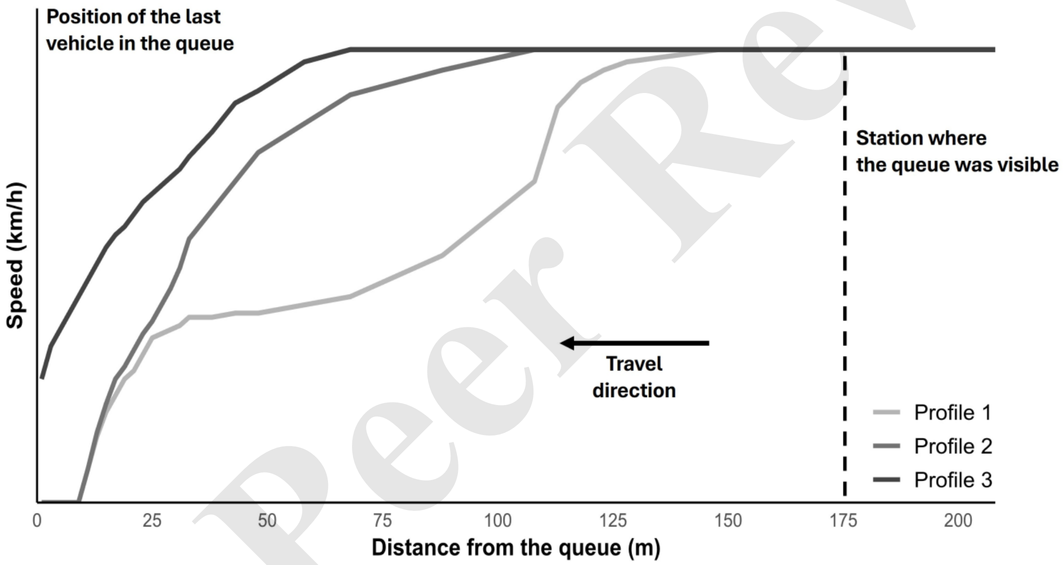
Figure 6: Box plots of the data and results of the Welch's t-test for (a) number of blinks, and (b) number of fixations measured 500 m before the section where the queue was visible until the driver stopped the vehicle (see Figure 3).

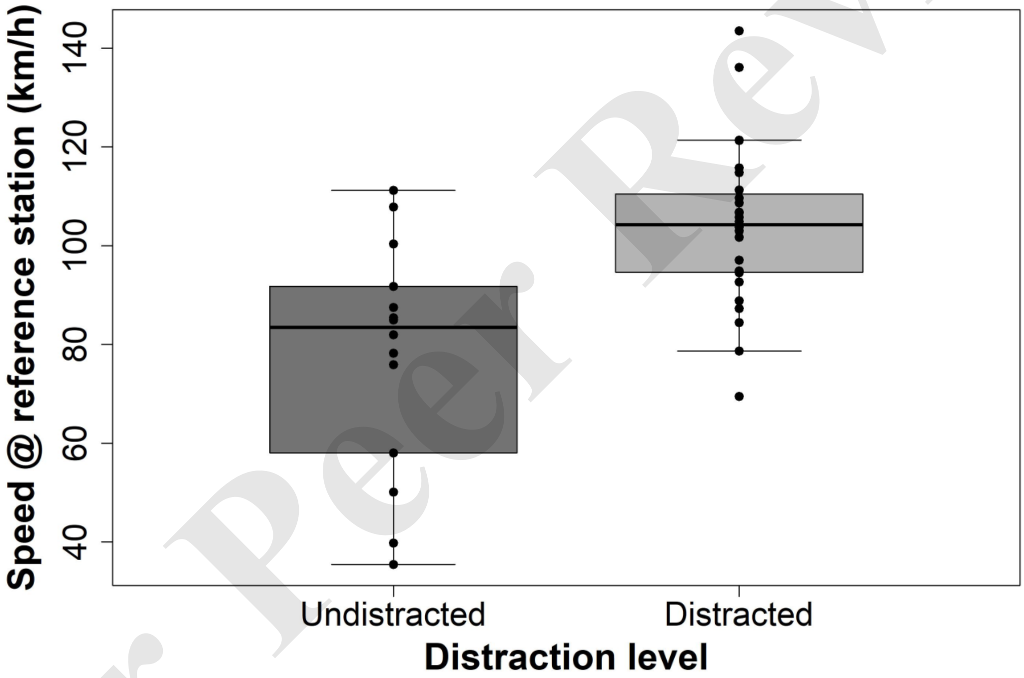
Figure 7: Heat maps of drivers who oriented their gaze on a wider area of the road environment (Note: the red colour indicates a high number of gaze fixations).

Figure 8: Heat maps of drivers who concentrated their gaze on a limited area, mostly on the inner edge of the road (Note: the red colour indicates a high number of gaze fixations).


60

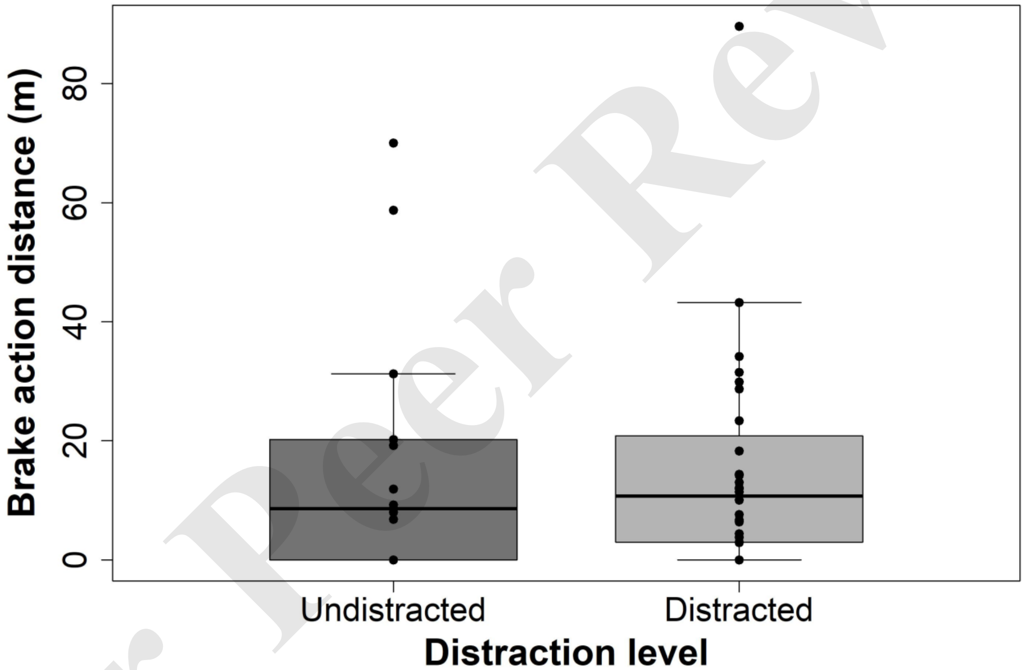

Length for measuring the number of blinks and fixations
S_{ref}
d_{TR}
d_{AB}
d_{Stop}
Queue of vehicles
THROTTLE
BRAKE
500 m
175 m
Station where the secondary task started
Station where the queue was visible


Position of the last
vehicle in the queue
Station where
the queue was visible
Speed (km/h)
Travel
direction
Profile 1
Profile 2
Profile 3
0
25
50
75
100
125
150
175
200
Distance from the queue (m)

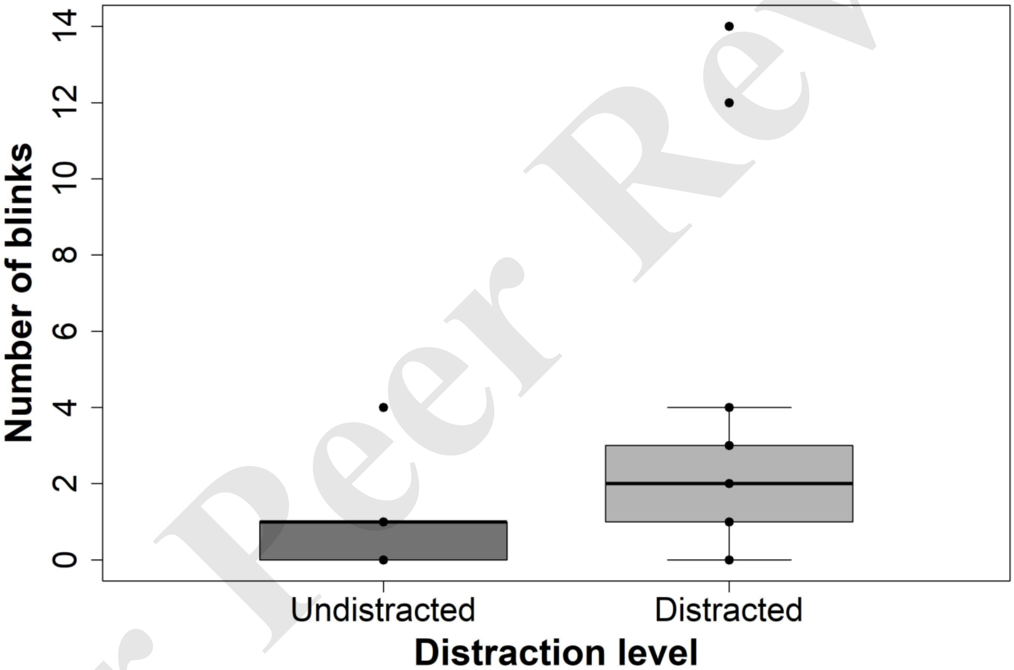

Speed @ reference station (km/h)
140
120
100
80
60
40
Undistracted
Distracted
Distraction level

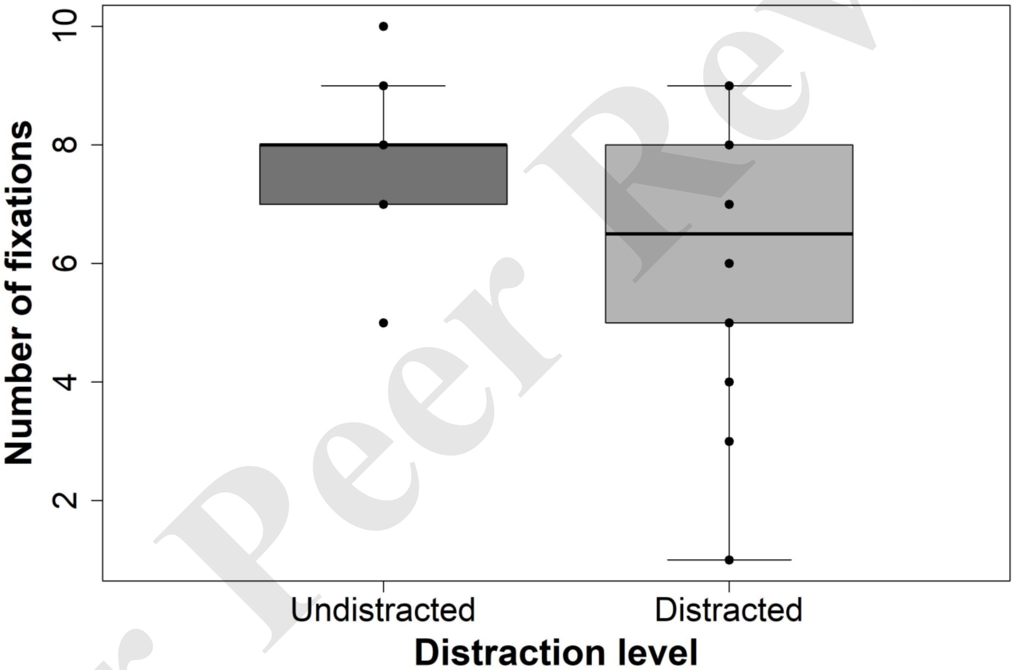

Deceleration rate (m/s2)
5
10
15
Undistracted
Distracted
Distraction level

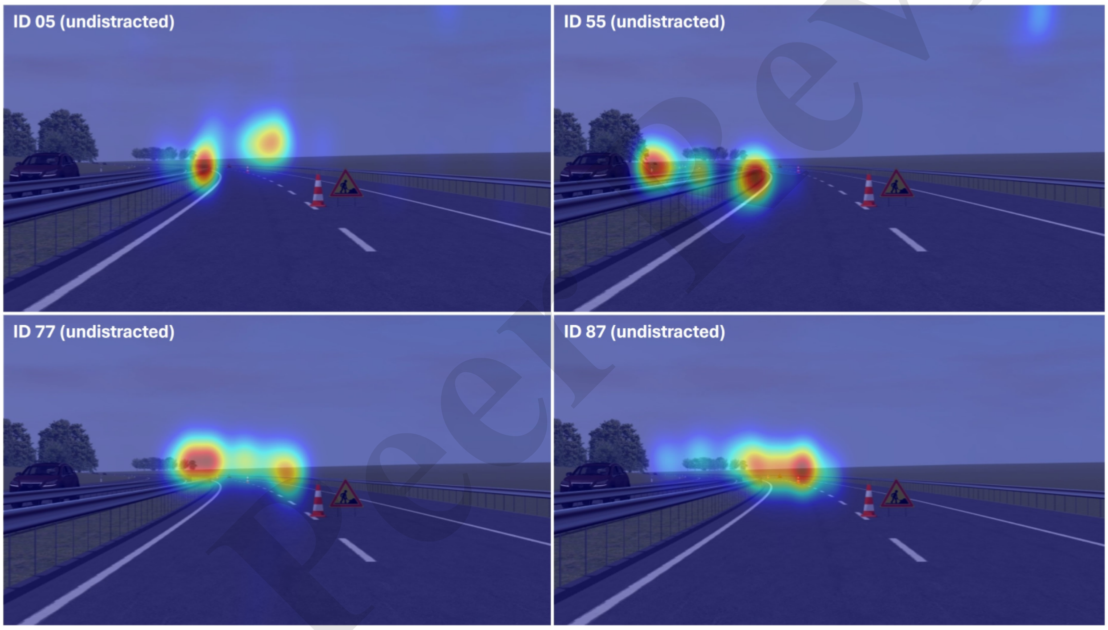
Throttle release distance (m)
0
20
40
60
80
Undistracted
Distracted
Distraction level


Brake action distance (m)
0
20
40
60
80
Undistracted
Distracted
Distraction level

Stopping distance (m)
80
100
120
140
160
180
Undistracted
Distracted
Distraction level


Number of blinks
0
2
4
6
8
10
12
14
Undistracted
Distracted
Distraction level


10
8
6
4
2
Number of fixations
Undistracted
Distracted
Distraction level


ID 05 (undistracted)
ID 55 (undistracted)
ID 77 (undistracted)
ID 87 (undistracted)


ID 12 (distracted)
ID 30 (distracted)
ID 57 (distracted)
ID 79 (distracted)