THE INFLUENCE OF ROAD SIGNS ON DRIVER’S PERFORMANCE

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Abstract
The study has proposed to identify and solve the problem of road sign’s location in traffic. The users were drivers, and due to the methods used we could identify that the traffic information in the intersection were very crowded, which leaded to drivers disorientation and increasing the number of accidents. The variant who I presented has proved difficult to use for drivers. This allows driving activity in a more inefficient manner presenting an agglomeration of road signs. So driving activity involving the driver all its capabilities on the one hand, and equally rescheduling entire assembly of standards that must function in optimal connection between man and machine.

Keywords: the car, performance, the accidents, the traffic indicators

1. INTRODUCTION
The driving activity in difficult situations, such as road congestion, represents a set of actions characterized by the rapidity of external stimuli succession and the driver’s reaction speed. It has been noticed, during a city traffic experiment conducted on 100 drivers, that approximately 62 external factors interfere and in this period the driver must that about 34 to 37 different decisions. This simple experiment shows that the human body reactivity, while driving the car, represents a set of psychological and physiological reactions. The road signs have made to exceed the nationality limits and they are available to all of us no matter other factors. Besides the importance of following them in traffic, they have the purpose of adjusting by rules the way we drive. The dimensions and distances of placing the road signs must be settled according to the legally established parameters in order to fluidize the traffic. Positioning them correctly helps the driver on the congested roads.

A recent study had the objective to verify the way the drivers in different countries understand the purpose of the road signs and the results have led to the idea that the significance of the road sign is highly influenced by its design, meaning that good design must reflect the road sign’s orientation (D. Shinar, R. E. Dewar, H. Summala, and L. Zakowska 2003). Driving is a specific activity form, objectively
characterized by the existence of a task – determined are that must be fulfilled on a certain level of performance-efficiency, and subjectively, by investing a quantum of openness and abilities to succeed in the proposed objective.

Becoming aware and estimating from the perspective of the settled purpose, the effects of every executed operation, the driver develops the possibility of improving skills and mastery of his own activity. Also, he gets to choose the activity which will be executed and to determine its parameters (speed, amplitude, duration) by anticipating its effects which were previously registered, thus avoiding errors.

The authors Helmut T. Zwahlen and Thomas Schnell (1998) conducted a study trying to show the role and importance of a correct visibility of road signs for the drivers. They made an experiment in which the subjects had to detect the road sign both on natural lightning conditions and during the night, and they noticed the importance of the road signs and circulation messages for the driving safety by alerting the drivers about the dangers that interfere and applying these road signs according to the human visual and motor capacities and the entire system of information processing.

The gravity of a driving accident is influenced by multiple factors. One of them is represented by the weather conditions, as the weather can lead to driving accidents both locally and nationally, through unfavorable factors such as rain, fog or strong wind. When the good weather occurs and it’s sunny, the context changes and we notice a significant lower number of traffic accidents. (Julia B. Edwards, 1998).

Crenguţa Oprea (2012) conducted a study related to risk behavior while driving and a complex, continuously changing reality was noticed based on the high number of driving accidents. An explanation was looked for by several approaches, thus driving risk behavior is mostly influenced by the contextual and structural stimuli. Tomaz Tollazzia and Marko Rencelj (2011) conducted a study on the placement of road signs and road design, in Slovenia. According to them the crossroads must be built in order to permit safe driving and not leading to accidents because of the weak visibility caused by trees, forests or poorly illuminated roads. Road signs must be placed in clear locations and must be easy to understand, as while drivers only have a limited time to noticed them and make the correct maneuvers. Road signs must also be placed in an optimum number, as too high or too low number may put the traffic in danger.

A study conducted in Finland related to preventing traffic accidents, was focused on analyzing traffic risk behavior of the male and female subjects; it was noticed that an accident caused by men usually doesn’t imply other cars, while women tend to hit other cars in the collisions they’re involved in.

Risk driving behavior plays a highly important role in the case of men including losing control over cars, compared to women who connect to risk behavior by lacking abilities of maneuvering the car, which can be radical in certain situations (Sirkku Laapotti, Esko Keskinen, 1998). Related to age, studies have shown that young man show higher risk of producing accidents compared to younger women,
in Europe; many countries are tending to give a driver’s licence based on several phases, starting with the probing period, driving under observation or protection (Divera A.M. Twiska, Colin Staceyb, 2007).

2. OBJECTIVE

Studying the degree in which placing road signs influenced the driver’s performance in traffic. Professional literature note that a very high percent of drivers are distracted while driving their cars by the signs outside the vehicle, thus misplacing indicators leads to lower performance in driving, also leading to a higher risk of accidents. What could be the influence of placing road signs over the performance in driving?

3. METHOD

3.1. PARTICIPANTS

Target population was represented by traffic participants aged between 18 and 55 years old, of middle and high education level and rich driving experience or no experience at all. The sample included 5 males who were familiar with the route and had experience and other 5 people who didn’t know the area and were new to driving a car.

3.2. INSTRUMENTS

1. Presenting the specific situation of the traffic participants (asking for task description by the users), which we may call the method of unstructured interview, the respondents giving the consent of participant to this experiment, and after passing the route, they describe the actions they had to make to pass through.

2. The second method that was used was the questionnaire, which included items resulted from the participant’s descriptions. We made a 9 item questionnaire, with two-option answers (yes or no).

3. The third method was represented by observation, both during describing the situation and during completing the questionnaire.

3.3. PROCEDURE:

The user’s description of a specific situation. “I don’t understand why they placed all road signs on this column, while I’ve got the traffic lights right in front of me, I don’t think the gyrotary is needed. The road indicators should be placed higher to help the drivers. The got me a little distracted.”

Describing a specific situation by the user: “And which one should I follow first, while in the crossroad I’ve got the gyrotary, so I’ve got priority, but the traffic light’s red? I don’t know the area that well and this crossroad is pretty cluttered. If I’m in trouble, though I’ve been driving a long time, what’s a beginner going to do?”
3.4. EXPERIMENTAL DESIGN

The work space: driving route (crossroads marked by road signs)
Activity: driving the car
User: traffic participants (drivers)

The road signs at the particular crossroad imply an overload of information, which leads into confusing the drivers. The purpose of orienting the driver in traffic turns intro misplacement and disorder for the drivers,

Context of use: users pass through the crossroad where the road signs are placed several times a day, for personal or professional purpose. The new or familiar road signs represent an important factor for the context of use.

Task model:
Prescribed task: participants are asked to drive on the indicated route, passing a certain crossroad and follow the road signs, according to the traffic rules.

The effective task: a consistent part of the ones who participated in the experiment did not succeed in understanding the road signs, and they did not succeed in driving according to the traffic rules.

The task model: to get to the destination, the driver gets in the car, goes to the gas station and fuels the vehicle, gets to the crossroad, evaluates all traffic signs and then tries to orientate according to the law and all signs, to get to the destination.

In figure 1 we notice a crossroad image. The indicators are placed with no logic and in a disorganized manner thus the traffic participants may be confused. Also, the sign that shows the passing of a streetcar, is not visible.
Figure 2. Example of road signs placed in a very tight frame

Figure 2 shows four cluttered road signs, around a tree. The sign that indicates the passing of pedestrians and the interdiction of passing are hidden behind a tree and difficult to notice by drivers.

Figure 3. Example of signs placed in a narrow area, two of them on the same column.

In figure 3, we can see a group of road signs, different by significance but grouped two by two on the column, which leads to the driver’s confusion.

4. RESULTS AND DISCUSSION

According the answers given by the respondents in the questionnaire, we may assert the following: the question related to the period of owning the driver’s license has led us to the conclusion that this period was not a variable to influence the confusion over the road signs. The same explanation we can give for item 2, which showed that most of the subjects were familiar with the route. As for item number 3, only one person marked the answer “no”, thus stopped in completing the questionnaire. The item related to lack of satisfaction for the placement of road signs, there was a 100% choice of selecting the “yes” answer, which shows the existence
of a problem in that specific crossroad. Analyzing the answers given to item 5 leads us to the following assertion related to experience, as respondents have given both negative and positive answers. We may interpret the following answers to the questionnaire items, in several ways: excessive placement of road signs, many of them being unnecessary; higher period of getting to the destination because of the road signs – the answer to these items were 7 of “yes. Again, for item 8 there was a 100% of asserting the fact that physical and psychological tiredness install because of the high demand of psychological functions. The collected data using the questionnaire were introduced in the Excel program, thus leading to the observation of a significant mean (m = 8) of the people who were unhappy with the placement of road signs. According to the questionnaire answers, most of the respondents mentioned a high load of information in that area. The questionnaire responses were mostly negative as far as the people’s dissatisfaction towards the system of placing road signs in the particular crossroad. The effects of driving are the following: the risk of higher number of accident, more needed time to get to the destination, confusion and psychological tiredness. Because of the results we obtained, we may consider the following ways of solving the errors caused by the road signs (solutions): placing indicators of localities at a corresponding height according to the driver’s eye sight’ if in the crossroad there’s a gyratory sign, we shouldn’t have to place traffic lights; placing road signs according to a distance that follows regulation; publicity panels placed on an optimal distance in order to not disorientate or tire the driver.

REFERENCES


**QUESTIONNAIRE**

**Instrucțiuni:** În cele ce urmează veți găsi mai multe afirmații ce vizează anumite comportamente din trafic. Citiți fiecare afirmație cu atenție și decideți dacă vi se potrivește sau nu.

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<thead>
<tr>
<th>Nr.</th>
<th>Afirmație</th>
<th>Răspuns</th>
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<tbody>
<tr>
<td>1.</td>
<td>Aveti de mult timp permis de conducere?</td>
<td>DA/NU</td>
</tr>
<tr>
<td>2.</td>
<td>Cunoașteți bine zona aceasta?</td>
<td>DA/NU</td>
</tr>
<tr>
<td>3.</td>
<td>Ati intampanat dificultăți in a va orienta si a parcurge traseul in mod legal?</td>
<td>DA/NU</td>
</tr>
<tr>
<td>4.</td>
<td>Aveti nemultumiri in legatura cu amplasarea semnelor de circulație?</td>
<td>DA/NU</td>
</tr>
<tr>
<td>5.</td>
<td>Credeți ca experiența în conducerea auto e un factor ce usurează aceasta sarcina?</td>
<td>DA/NU</td>
</tr>
<tr>
<td>6.</td>
<td>Considerati ca sunt necesare toate semnele de circulație?</td>
<td>DA/NU</td>
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<tr>
<td>7.</td>
<td>Amplasarea acestor semne mărește durata de parcurgere a traseului si ajungerea la destinatie?</td>
<td>DA/NU</td>
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<tr>
<td>8.</td>
<td>Va simțiți obosit psihic si vizual dupa parcurgerea traseului?</td>
<td>DA/NU</td>
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<tr>
<td>9.</td>
<td>Da cu nu ar fi semaforul in aceasta intersectie v-ar fi mai usor sa parcurgeti traseul?</td>
<td>DA/NU</td>
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**Rezumat**

Studiul și-a propus identificarea și rezolvarea problemei amplasării semnelor de circulație. Utilizatorii au fost conducătorii auto, iar datorită metodelor folosite am putut identifica faptul că în intersecția respectivă există o supraîncărcare de informații rutiere, ceea ce conduce implicit și la dezorientarea șoferilor și astfel la creșterea numărului de accidente. Varianta pe care am prezentat-o s-a dovedit greu de utilizat pentru conducătorii auto. Aceasta permite realizarea activității de conducere auto într-o manieră mult mai deficitară prezentând o aglomerație de semne de circulație. Așadar, activitatea de conducere auto implică conducătorul auto cu toate capacitațile sale, pe de o parte, dar în aceeași măsură și întregul ansamblu de mecanisme ce trebuie să funcționeze în standardele conexiunii optime între om și mașină.