International Journal of
Traffic and Transportation Psychology
Volume 2, ISSUE 1 / 2014 - www.ijttp.ro

ERRORS MADE BY YOUNG DRIVERS WHILE DRIVING

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Abstract

The study aims to analyze the most common mistakes novice/young drivers make when driving. The study was conducted on a group of 32 students of the Faculty of Psychology and Educational Sciences,, University of Bucharest. Of these, 29 belong to the group of participants (20 women and 9 men) and 3 of the expert group (two women and one man). Participants were applied a single questionnaire. The Errors in Driving Activity Questionnaire (EDAQ) was designed and built in the study. The questionnaire was built based on the taxonomy proposed by Salmon, Regan and Johnston (2006). The study results reveal that the majority of errors made by young drivers are caused by problems related to other road users and the perceived lack of enforcement of the law. The study highlights the prevalence of certain conditions and errors concerning the young driver. We discussed the theoretical and practical implications of the results, limitations of the study and future directions suggested.

Cuvinte cheie: *analiza erorilor,preventia erorilor,abordarea erorilor, esec, greseala, violare*

Keywords: *analysis of errors, prevention of errors, error handling, failure, lapse, mistake, violation*

1. INTRODUCTION

Road accidents. Studies show that 90% of car accidents are due to driver behavior and that in 90-95% of accidents the human factor is the sole factor involved or one of the factors involved in causing the accident (Bener, Crundall, Haigney, Bensiali, & Al -falasi, 2007). The UK Road Safety Foundation conducted a study to identify some of the reasons why on certain routes the accident rate is much higher. Data were collected between 1988 and 1994. Data on accidents are taken from six rural routes in Cambridgeshire, UK. The reason for which these were analyzed is that, although they represent less than a quarter of all roads in the county, two thirds of accidents occur here. Data on injuries were collected by video methods and drivers who had accidents on these roads between 1993 and 1994 received a questionnaire by mail (Foundation for Road SAFTEY Research, 1996).

The survey shows that, by day, 36% of injuries occurred when the road was wet. At night 51% of the injuries occurred when the road was wet.

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Most drivers (both women and men) who have had accidents on rural roads were familiar with the road (AA, 1996).

Error analysis. The Manchester questionnaire for driving behavior (DBQ) originates from Reason's theory of error (Wahlberb, Dorn, & Kline, 2011). It is one of the most commonly used questionnaires to measure driving behavior. It measures errors, slips and driving violations. Its application in many countries has led to the finding that drivers behave differently depending on the country in which they live. This is based on external factors (social conditions, weather conditions in that country). Applying the questionnaire in Dubai showed that the number of accidents involving young people, both women and men increased (Bener et al., 2007). Studies show that the total score on the Cognitive Failures Questionnaire (CFQ) can identify drivers who are prone to making mistakes while driving, but can not predict traffic accidents (Allahyari et al., 2008).

Traditional approaches in terms of improving automobile safety systems focus on individual system components. In this regard automobiles that can better withstand accidents were built, roads upon which traffic control systems can be placed were designed and programs destined to inform drivers about speed and drunk-driving were initiated. Although these efforts were successful, data on road accidents show that they are not enough. Sweden took the lead in the implementation of different strategies to decrease the number of accidents and victims of road accidents. The new approach assumes the investigation of the human factors to make a connection between the construction of roads, the construction of automobiles and educational initiatives (Charlton, Alley, Bass, & Newman, 2002).

Human factor specialists working in the field of road safety argue that the analysis of the transport system should include the whole system: car, road and driver related factors. Thus, although 90% of road accidents are based on drivers' mistakes, when analyzing this we should be taken into account the faulty design of road and car (Charlton et al., 2002). The studies conducted have focused on the perception of traffic signs, driver fatigue and the interaction between driver, car and road. Results suggest the placement of bigger traffic signs. During driving most of the signals are received visually. To correctly grasp the moving speed and the instructions provided by traffic signs, placing larger traffic signs would be one of the possible solutions. Regarding fatigue, the study shows that truck drivers in New Zealand shows high scores of daytime sleepiness. Future study directions include the testing of an alternative way of traffic lanes change, an inventory of risk perception and road model, among certain demographics, the development of test procedures of the degree of understanding and attention to certain signs of circulation (Charlton et al. 2002). To analyze accidents a taxonomy of factors that lead to them is needed. Such a taxonomy was carried out for aviation accidents and constant improved was noticed. For error analysis involved in auto accidents a prototype model was built.

It is used to highlight the interaction of conditions that contribute to accidents and driver behavior. To achieve the taxonomy, Salmon, Regan and Johnston (2006) used the prototype model and investigate the literature. The schemes and taxonomy

that have been investigated by Salmon et al. (2006) are The taxonomy of factors that contribute to road accidents, the DREAM classification scheme, the general types of mistakes in road transport, drivers errors and factors causing incidents, taxonomies of factors that contribute to accidents that relate to road and vechicle, HFACS, AcciMaps, ICAM, general mistakes types TRIPOD DELTA, factors related to rail traffic issues REVIEW, PEAT contributing factors, MEDA list of factors that contribute to accidents, CPIT factors contributing to accidents, the REDA factors that contribute to accidents, the TRACER factors that shape success.

The model proposed by Salmon et al. (2006) shows how external factors lead to behavioral errors. The model divides the factors that may cause errors into categories and subcategories. The factors may act individually or in groups when influencing driver behavior.

The model divides factors that contribute to road accidents in four categories: factors related to road infrastructure, vehicle related factors, factors related to the driver, factors related to other road users and factors related to environmental conditions (Salmon et al., 2006). Factors related to poor road infrastructure include improper conditions of the road infrastructure, i.e. road scheme, street furniture, the conditions pertaining to rules, policies traffic. Factors related to the vehicle include those inadequate conditions of vehicles involved in road traffic, i.e. man-machine interface, the conditions related to the maintenance technology. Factors related to driver refers to the psychological state, mental readiness, experience, abilities and skills, the conditions related to the context and compliance. Factors related to other road users relate to the conditions created by other road users, namely the behavior of other drivers, the behavior of pedestrians, law enforcement and other behaviors related to other road users. Factors related to environmental conditions refer to those environmental conditions that can affect driver behavior, ie weather conditions, the degree of light, time of day and conditions related to road surface (Salmon et al., 2006). Factors from the five categories influence driver behavior in terms of cognitive behavior, perception, planning and decision making, as well as physical, tasks related to vehicle control, visual scanning. In most cases the impact that these factors have on drivers is minimal. The level of skills and experience are mediator factors. The driver can also make errors that are not due to the factors mentioned above (Salmon et al., 2006). Factors can cause behaviors that fall into four categories of errors: failures, lapses, mistakes and violations (Salmon et al., 2006).

The notion of error is related to time and decision. There is no error without a reference to time. Errors involve decision, a choice route, a variant (Joseph & Marhan, 2003). According to the taxonomy developed by Salmon et al. (2006) cognitive failures are errors related to decision-making, this category includeing failures of perception; erroneous assumptions; omitted planned actions; inattention; distraction of attention; errors of judgment, to look, but do not see; failure to comprehend the situation. Slips are errors related to the action, this category includes failure to make an action that is necessary; wrong action; incomplete action; right action on the incorrect object. Mistakes are errors related to observation, verification, in this category being included: failure to ensure, to

check; incomplete verification; proper check on incorrect object; checking in at a bad time. Violations are divided into two categories: errors related to making/finding information and violations. Errors related to making/finding information include misinterpretation; understood/incomplete or interrupted information. In the category violations we can find willful and unintentional violations (Salmon et al., 2006). The overall objective of this research is to conduct an analysis of the most common causes, circumstances and consequences of errors caused by novice/young drivers while driving, on a group of students of the University of Bucharest, Faculty of Psychology and Educational Sciences, Bucharest, Romania.

2. METHODOLOGY

2.1. PARTICIPANTS

The study was conducted on a total of 32 people, including 29 people belonging to the group of actual participants, students at the University of Bucharest, Faculty of Psychology and Educational Sciences (90.63% participants, of which 68.97% women, 20 women and 9 men) and three people part of the group of experts, students at the University of Bucharest, Faculty of Psychology and Educational Sciences (9.38% experts, of which 66.67% were women, two women and one man). The generic name of the group of participants is "participants". Participants are currently bachelor or master degree students at the University of Bucharest, Faculty of Psychology and Educational Sciences. They are aged between 19 and 23 years (M = 19.68, SD = 1.07). Regarding age/experience since obtaining driving license, the participants had between 2 months and 48 months of experience. The generic name of the group of experts is "experts". The experts group participants were aged between 22 and 23 years (M = 23, SD = 0.57). Regarding age/experience since obtaining driving license, experts had between 4 months and 60 months of experience. In addition, other data were collected on participants that explains that all are Romanians, have a higher educational level (at least in progress), has no physical or mental disabilities and are not immigrants, the preferred language being Romanian (reason for which informed consent instruction and the questionnaire were conducted in Romanian). Also, participants were required to have no more than five years of driving experience (since they acquired driving license) (Schmidt, 2012).

2.2. RESEARCH INSTRUMENTS

Participants were applied a single questionnaire, designed and built within the research, called The Errors in Driving Activity Questionnaire (EDAQ) diagnosis of failure, lapse, mistake and violations of novice/young drivers while driving. The instrument was self-administered, applied using the pencil-paper format, there being no time required for completion. The results were encoded for each participant. Thus, each participant had a code of the first two letters of their name, the first two letters of their surname and the day they were born (eg DISI31). Also,

all participants completed information on age, gender, and driving experience from the moment they acquired driving licenses (in months). It may be mentioned that the experts provided the same types of information. Each participant received for completing six pages, which included the following order: informed consent, identification information and the questionnaire that includes the items and completion instructions.

The Errors in Driving Activity Questionnaire (EDAQ) consists of 54 items, presents six scales, was designed and developed in the present research and evaluates the errors made by novice/young drivers while driving. Each scale was named after the taxonomy and error conditions encountered in specialized studies on driving (Salmon et al., 2006). The scale "Road infrastructure factors" comprises 16 items (items no. 4, 7, 12, 16, 18, 20, 29, 32, 37, 40, 41, 43, 44, 46, 47, 49). The scale "factors regarding vehicle" comprises of four items (items no. 11, 27, 35, 54). The scale "factors regarding the driver" comprises of 19 items (items no. 3, 8, 9, 10, 15, 19, 21, 22, 24, 25, 26, 30, 33, 36, 39, 42, 45, 51, 52) . The scale "factors regarding other road users" includes 4 items (items no. 5, 13, 34, 38). The scale "environmental factors" includes nine items (items no. 1, 2, 17, 23, 28, 31, 48, 50, 53). The scale "Other factors" includes 2 items (items no. 6, 14). We used a Likert scale from 1 to 5, 1 = very rarely, and 5 = very often. Also, there were no reverse scored items.

Regarding internal consistency, the Cronbach Alpha coefficient for the questionnaire for the entire questionnaire is $\alpha = .85$. Thus, for "road infrastructure factors", internal consistency is good, $\alpha = .77$ for "factors related to the driver", the coefficient is $\alpha = .63$, for "environmental factors", Alpha Cronbach is $\alpha = .71$, meeting the requirements of Nunnally (1968) of at least .60 in exploratory research, but the "factors regarding the vehicle" and the "factors regarding other users", the Cronbach Alpha was lower than .60 while for "other factors" we could not test the internal consistency as there were just two items. The minimum required for testing internal consistency is three items (Hair, Wolfinbarger-Celsi, Money, Samouel & Page, 2011). In these conditions, for subsequent application the improvement of scales with problems concerning reliability is recommended. In terms of statistical inference, they are done using SPSS 19.00 IMB and Microsoft Excel.

2.3. PROCEDURE

The procedure of constructing the questionnaire. The following will present the design and construction which have led to the realization of The Errors in Driving Activity Questionnaire (EDAQ) for young drivers (see Table 1).

Table 1 The steps for the construction of the questionnaire, adapted from Carayon and Hoonakker (2001) and Charlton (2002)

No.	Stage	Stage description
1.	Conceptualization	The precise definition of the concepts to be measured .
2.	operationalization	Documentation of relevant literature on the field. Listing of sub-dimensions for each category.

		.
3.	Possible sources - questionnaires	Examination of existing questionnaires validated and used in the previous research question.
4.	Construction of the questionnaire	Pursuit and fulfillment of requirements for building appropriate questions and generate useful analysis. One must answer the following questions: What kinds of questions will be used? What type of response scale will be used? What will the items of the questionnaire be? What introductory instructions and what information will be included?
5.	Pre-testing on a group of experts	The questionnaire is controlled for grammatical errors, typing errors, then applied on a small group of subjects / experts. Experts assess the questions (clarity, relevance, choice) format (instructions, aesthetic) and the time required to complete the questionnaire.
6.	Final form and applying of the questionnaire	Correct the issues listed and recommended by experts. Prepare the final version of the questionnaire and application on participants / young drivers.

In the first phase, we defined the types of errors (failure, lapse and mistake) and violations respectively categories of conditions that can lead to some errors. Thus, as noted in the introduction to research:

Failures are cognitive errors related to decision-making, this category includes failures of perception; erroneous assumptions; planned actions that are omitted; inattention; distraction of attention; errors of judgment, to look, but do not see.

Slips are errors related to the action, this category includes failure to make an action that is necessary; wrong action; incomplete action; right action on the incorrect object.

Mistakes are errors related to observation, verification, this category including: failure to ensure to check; incomplete verification; proper check on the incorrect object; checking at a bad time.

Violations are divided into two categories: errors related to making, finding information and violations. Errors related to making, finding information includes misinterpretation; not understood information; incomplete or interrupted information. In the category violations we can find willful and unintentional violations (Salmon et al., 2006).

Regarding the conditions under which accidents occur, they concern four main categories, according to Salmon et al. (2006).

1. Factors related to road infrastructure;
2. Factors related to the vehicle;
3. Factors related to the driver;
4. Factors related to other users;
5. Factors related to the environment;

6. Additional factors.

In the second phase, conditions were operationalized, to be more exact they were divided into sub-categories and sub factors for each category outlined in the previous step. The sub-categories are:

For category "Factors related to road infrastructure':

- Complex road
- Unfamiliar road
- Confusing road
- Road markings
    - Confusing
    - Familiar
    - With an obstructed vision

- Traffic signs
    - With an obstructed vision
    - Unclear
    - Lacking
    - Confusing
    - Incorrect
    - Improper location

- Traffic light
    - Dysfunctional
    - Obstructed
    - Improper location

- Advertising
    - Improper location
    - Obstructs the visibility of traffic signs or traffic lights
    - Distracting

- Road rehabilitation works
    - Problems of maintenance of the road
    - Road condition
    - Road Markings
    - Traffic light
    - Traffic sign
    - Area dedicated to pedestrians

- Road traffic rules, regulations and policies
    - Regulation that confuses

- Other

For the category "factors related to the vehicle" we have the following sub factors:

- Human-machine interaction
  - Vehicle control design
  - Automatic transmission problem

- Mechanical Problems
  - Engine failure
  - Signaling problem
  - Steering problem
  - Problem with the tire / wheel
  - Other

- Incorrect use of technology in the vehicle
  - Mobile Phone
  - PDA
  - Laptop
  - TV
  - video game
  - Other

For the Category "driver related factors", we have the following sub factors:

- Physiological
  - Physical fatigue
  - Drugs
  - Alcohol
  - Medication
  - Disease
  - Visual limitation
  - Physical limitation
  - Emotional distress

- Mental status
  - Emotional suffering
  - Factors related to task

- Loss
  - Desire to reach the destination

    - Unknown surroundings

- Training
    - Inadequate preparation
    - Qualified for other competence

- Experience
    - Degree of familiarity with the car
    - Degree of familiarity with the road
    - Too high degree of familiarity with the road
    - Too high degree of familiarity with the car

- KSA
    - Insufficient competence
    - Insufficient knowledge
    - Degree of understanding
    - Inability to understand the capacity of the vehicle
    - Inability to understand the markings on the road
    - Inability to understand the road scheme

- Effects due to passengers
    - Peer pressure
    - Distraction
    - Lack of assertiveness / confidence
    - Communication problems

- Lack of compliance / violations
    - Intentional violation of traffic rules
    - Deliberate violation of laws

For the category "factors related to other road users", we have the following sub factors:

- The behavior of other drivers
    - Lack of compliance / violation of traffic rules

- Pedestrian Behavior
    - Lack of compliance / violation of traffic rules

- The behavior of cyclists
    - Lack of compliance / violation of traffic rules

For the category "environmental related factors", we have the following sub factors:

- Weather conditions
  - Fog
  - Excessive light due to sun
  - Snow
  - Rapid changes in weather
  - Flooding of the road

- Lighting conditions
  - Dark
  - Sunset

- Time of day
  - Early morning
  - Afternoon
  - Evening
  - Late night

- Condition of road surface
  - Wet
  - Slippery

For the category "Other factors" we have the following sub factors:

- Bodies of Law
  - Lack of law enforcement
  - Distraction due to the presence of law enforcement

In the third stage, existing and used questionnaires were examined that are based on the analysis of errors in the activity led by drivers. As presented in the introduction, two highly used in previous studies questionnaires were studied namely the Manchester questionnaire for driving behavior (DBQ) and Cognitive Failures Questionnaire (CFQ). Those questionnaires were useful to understand the distinction between possible causes and consequences of the error itself, offered examples of items from which to start the design and construction of questionnaire items used in research and provided a model for structure, layout and presentation of the items.

In the fourth phase, the questionnaire was constructed based on the taxonomy outlined in earlier phases of the conditions and errors that may be made by drivers

while driving. The type of item used was presentation of statements indicating the numeric extent when faced with these problems. Targeted response modality used a 5 points Likert scale, from 1 = never, 5 = very often. Regarding the construction of the actual item, it can be seen in Appendices (see Appendix B). The questionnaire consisted of 103 items in the first instance. Regarding the instructions and information provided in the questionnaire, they focused primarily on informed consent (see Appendix A) - which is unchanged for both participants and experts, and that instruction of the questionnaire. Expert instruction questionnaire can be viewed below (Figure 1):

individual CODE *:.....;
** the first two letters of their name, the first two letters of their surname and the day they were born (eg DISI31).*

Sex:.....; **Age**:.....; **Period since having a driving license**:.....
INSTSTRUCTIONS
The following describe common situations encountered by drivers. Carefully read each statement and then think about your point on a scale from 1-5 how frequently you experience situations similar to those given below.
1 = Never;
2 = Very rare;
3 = Sometimes;
4 = Often;
5 = very often.

Figure 1. Information found in the questionnaire given to experts for analysis

In the fifth phase, the questionnaire was given towards analysis and evaluation to an expert group consisting of three people. Previously, grammatical errors or typing and questionnaire items problems were corrected. The reformulation of four items in the questionnaire was indicated: 7, 9, 100 (now 35) and 83 (now 44) and the removal of 49 items that were not considered relevant for young drivers of the Romanian population according to experts (these were ranked with 1 or maximum 2 points on the scale or importance and relevance was indicated from the start elimination - zero points). Removed items are: 11, 13, 14, 17, 20, 22, 23, 28, 29, 30, 34, 35, 36, 37, 38, 39, 41, 43, 46, 47, 48, 49, 50, 55, 57, 58, 60, 61, 63, 65, 67, 69, 72, 73, 74, 75, 80, 81, 82, 85, 87, 90, 93, 95, 96, 97, 101, 102, 103. The questionnaire with the remaining and reformulated items can be viewed in the appendix (see Appendix C).

A detailed presentation of each change, item, factor, sub factors and error was performed (see Appendix D). Regarding the categories of response, changes were made following recommendations proposed by Charlton (2002) and Carayon and Hoonakker (2001), that response options must be symmetrical:

1 = Very rare;
2 = Rarely;
3 = Sometimes;
4 = Often;
5 = very often.

Other modifications have been made on the format. Thus, experts have indicated that they are skeptical about confidentiality, their informed consent requiring full name and that whole signature and the document with the stapled questionnaire. Thus, so as to reduce this problem, participants were made clear that their name will not be associated with the results of the questionnaire and that the informed consent and questionnaire will separately be given to completion without being stapled. Later, an issue with the labels was reported. These appeared only at the beginning of the questionnaire, on the first page, so the experts felt the need to return back to the first page to make sure that they choose the desired response. To eliminate this problem, it can be seen that the questionnaire given to participants had labels on each page of the questionnaire. Finally, the last issue highlighted both in the literature and by the experts is the idea that completion time must be significantly shorter (Lehto & Landry, 2013). By reducing the number of items from 103 to 54 completion time was reduced exponentially. This decision minimizes the chance of completing randomly (participants do not get bored or tired during completion).

In the sixth phase, corrections and the improvements indicated by experts were made,after which the final form of the questionnaire was conducted (see Appendix C). In these circumstances, we went to the application of the questionnaire itself.

Working procedure. Initially, there was a discussion with the coordinator teacher and the teacher assistants to receive the agreement to give the questionnaire to students during seminars on the day of 01/17/2014, between 10-12, 12-14, 14 - 16, 16-18, in the Zapan hall (ground floor), located in the Faculty of Psychology and Educational Sciences, University of Bucharest.

In the second phase, each of the four targeted seminars were presented with general information about the research and its purpose. After that, it was clear that drivers only with experience of five years from the time they obtained a driver's license can participate. Later, participants were required informed consent and they were given instruction to complete the questionnaire in accordance with Article 14.3 of the Code of Ethics.

After collecting and analyzing the data the stage where participants were presented the results should have followed, as it was specified in informed consent as a form of motivation. But there were no people interested in the research results.

3. RESULTS

Before the actual presentation of the results we have to indicate that we examined whether there is a normal distribution of the six factors measured by the questionnaire. A Shapiro-Wilk normality robust test was used, as n = 29. The analysis revealed that the distribution is normal in five of six factors, except for "factors related to the other users" (p = .041). Also, there were no missing data. After internal consistency analysis was performed, displayed in instruments presentation, histogram charts were made as recommended by Charlton (2002).

Histograms were made for each of the items (Figures 8, 9, 10, 11, 12, 13).

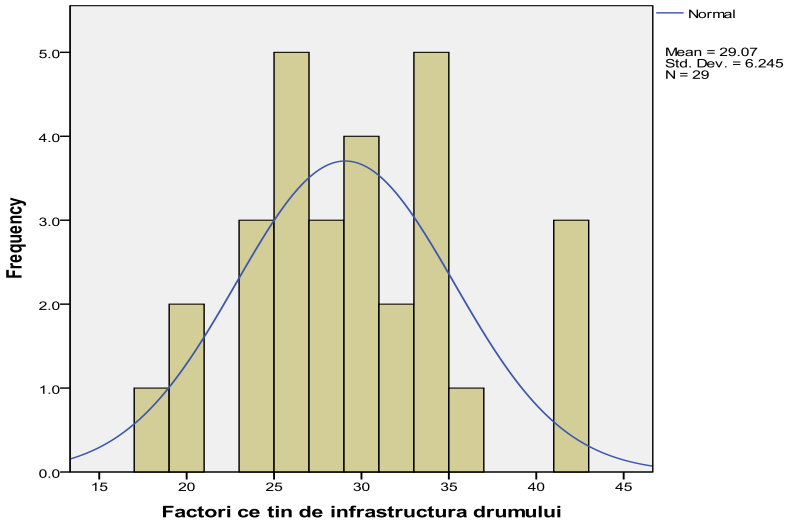

Figure 1. Histogram for "factors related to road infrastructure"

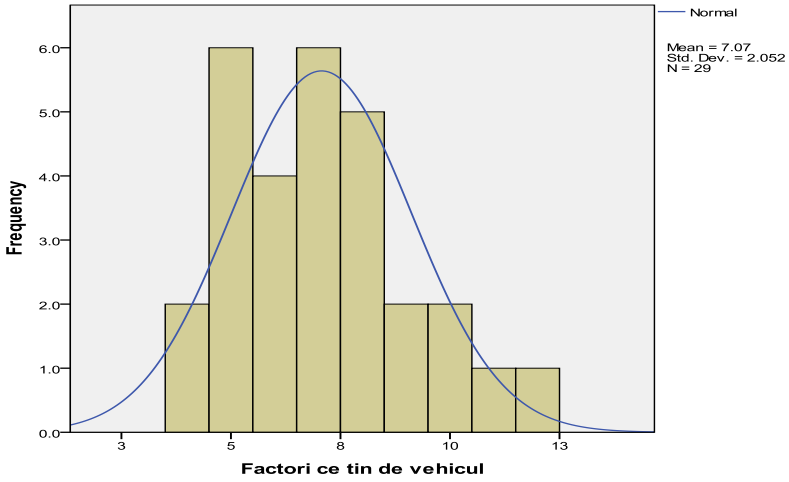

Figure 2. Histogram for "factors related to vehicle"

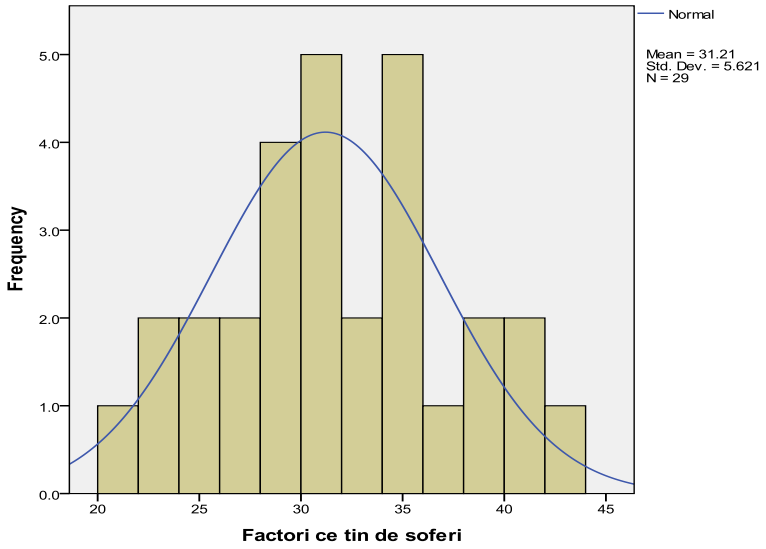

Figure 3. Histogram for "factors related to drivers"

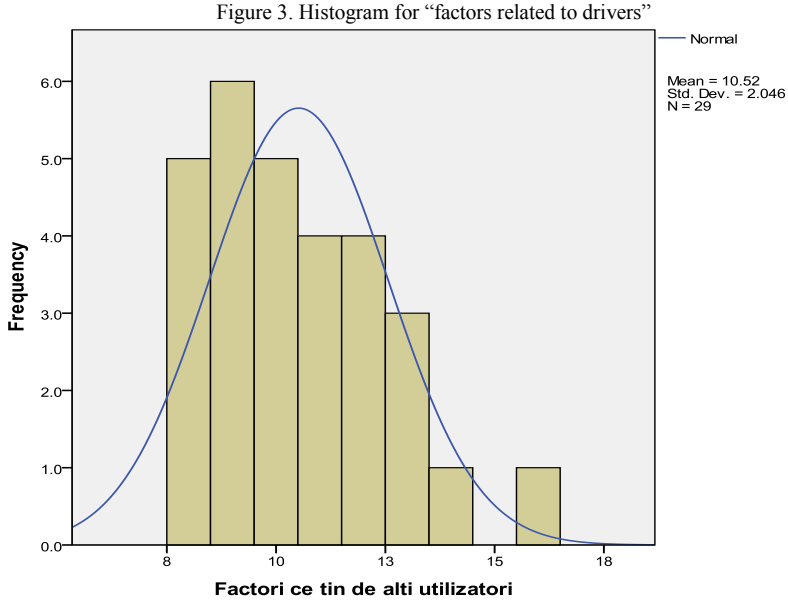

Figure 4. Histogram for "factors related to other users"

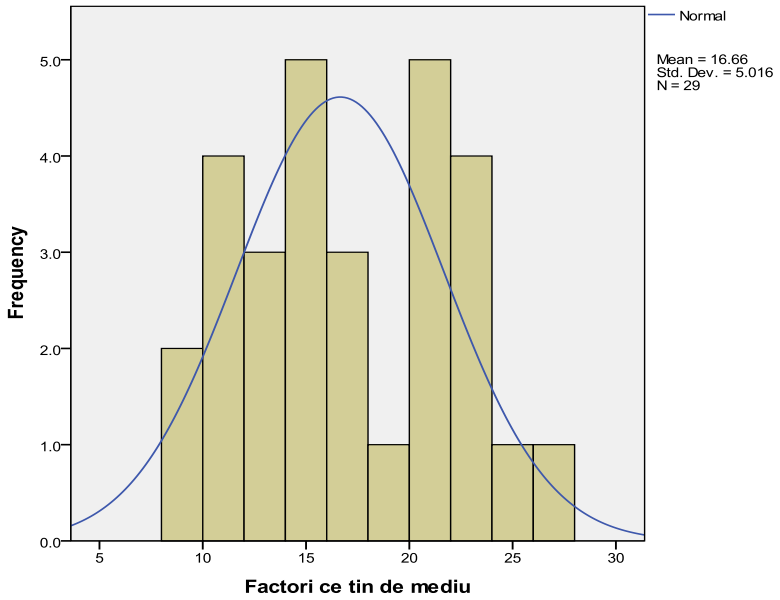

Figure 5. Histogram for "environmental related factors "

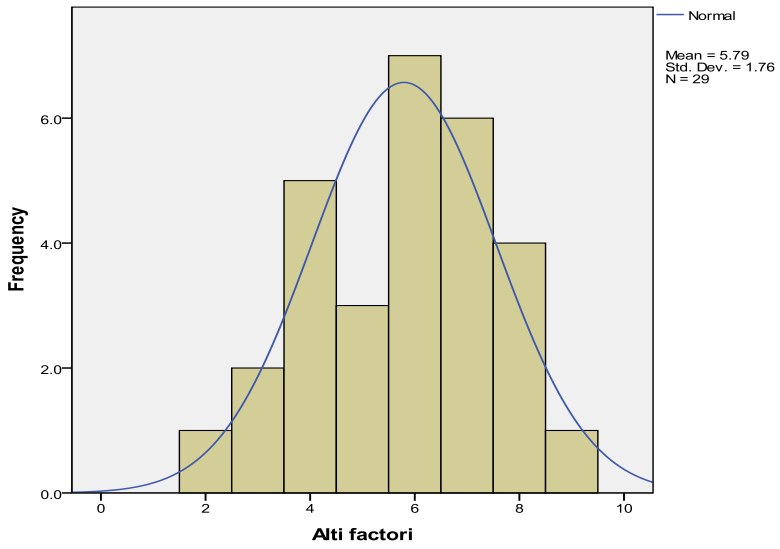

Figure 6. Histogram for "other factors

Values were calculated for central tendency relevant in this case, namely mode and median for each sub category / sub factors and that the frequencies and percentages (see Table 2).

Table 2. Values of central tendency, frequencies and percentages for each item

Nr. item	Mode	Median	Frequency (the most common item)	Percentage of item with the highest frequency (%)
1	1	2	1	48.3
2	1	1	1	65.5
3	1	1	1	69
4	1	2	1	48.3
5	3	2	3	37.9
6	**3**	**3**	**3**	**31**
7	1	1	1	62.1
8	1	1	1	72.4
9	1	1	1	51.7
10	1	1	1	72.4
11	1	1	1	62.1
12	1	1	1	55.2
13	**2**	**2**	**2**	**34.5**
14	**3**	**3**	**3**	**41.4**
15	1	2	1	41.4
16	**2**	**2**	**2**	**51.7**
17	1	2	1	41.4
18	1	1	1	69
19	1	1	1	82.8
20	1	1	1	62.1
21	**1**	**2**	**1 şi 2**	**37.9**
22	1	1	1	62.1
23	1	2	1	41.4
24	1	2	1	48.3
25	1	2	1	31
26	1	1	1	69
27	1	1	1	86.2
28	1	1	1	51.7
29	**1**	**2**	**1 şi 2**	**44.8**
30	1	1	1	62.1
31	1	1	1	62.1
32	1	1	1	51.7
33	1	1	1	69
34	**4**	**3**	**4**	**44.8**
35	1	1	1	58.6
36	1	1	1	72.4
37	1	1	1	51.7
38	**3**	**3**	**3**	**51.7**
39	1	2	1	48.3
40	1	2	1	44.8
41	1	2	1	48.3
42	1	2	1	48.3
43	1	1	1	58.6
44	1	1	1	48.3
45	1	2	1	48.3
46	**3**	**3**	**3**	**48.3**
47	1	1	1	55.2

48	1	1	1	65.5
49	1	1	1	58.6
50	1	2	1	41.4
51	1	1	1	62.1
52	1	2	1	37.9
53	1	2	1	41.4
54	**1**	**2**	**1 si 2**	**31**

Table 3. Most common situations young drivers face

Item Nr	item Description	frequency	Percentage (%)	Causes / Conditions	Errors
34	If I see a cyclist on the road I slow down because I'm not sure what he will do.	4	44.8	Factors related to other road users - cyclists behavior - lack of compliance / violation of traffic rules	failure
38	If a pedestrian crosses on the red light i brake suddenly to avoid him.	3	51.7	Factors related to other road users - pedestrians behavior - lack of compliance / violation of traffic rules	failure
46	I checked the speedometer and I realized that I was driving at greater a speed than allowed.	3	48.3	Factors related to road infrastructure - rules, regulations and movement policies, others	violation
14	When I thought there were no police cars on the street I turned on the continuous line.	3	41.4	Other factors - The bodies of law - no law enforcement	violation
6	When the radars were not on the road I drove with a speed higher than the legal one.	3	31	Other factors - The bodies of law - no law enforcement	violation
16	Although the road was uneven, I continued to drive fast.	2	51.7	Factors related to road infrastructure - road maintenance problems, the condition of the road	violation
29	Road marking was inappropriate and I did not notice that bike / pedestrian crossing.	2	44.8	Factors related to road infrastructure - inappropriate road marking	mistake
21	I went on a one-way street because I did not saw the sign,	2	37.9	Factors related to the driver - Lack of compliance / violations - unintentional violations of laws	Violation
13	If a pedestrian crosses through an unmarked area I suddenly swerve to avoid him.	2	34.5	Linked to other road users - pedestrians behavior - lack of compliance / violation	failure

				of traffic rules	
54	I accelerated to maximum using a new engine.	2	31	Factors related to the vehicle - Mechanical Problem - engine failure	mistake

Finally, a factor analysis was performed as recommended by Charlton (2002). It can be viewed in the Appendix (Appendix E). The analysis shows that the items do not load on original factors but forms other six factors / dimensions.

4. DISCUSSIONS

This study attempted to capture the most common causes, circumstances and consequences, errors that occur when driving regarding young drivers but also the design and construction of a questionnaire that enables error analysis in this regard.

4.1. Causes / Conditions

Table 4. The most common causes and conditions facilitating the occurrence of certain errors in the case of young drivers

Causes / Conditions
1. Factors related to other road users - cyclists behavior - lack of compliance / violation of traffic rules
2. Factors related to other road users - pedestrians behavior - lack of compliance / violation of traffic rules
3. Factors related to road infrastructure - rules, regulations and policies of movement, others
4. Other factors - legal bodies - the lack of law enforcement
5. Factors related to road infrastructure - road maintenance problems, the condition of the road
6. Factors related to road infrastructure - inappropriate road marking
Factors related to driver - Lack of compliance / violations - unintentional violations of laws
8. Factors related to the vehicle - Mechanical Problem - motor overload

Looking at Table 4, it can be seen that most of the errors made by young drivers are not caused by problems related to their person or the driven vehicle. Therefore, most cases concern the way in which other road users, pedestrians and cyclists act. Also, there is also an increased tendency to commit a violation when law enforcement (police) is not around, like exceeding the speed limit. If problems faced are not caused by other users, then they often are caused by aspects of road infrastructure, road condition in this case. The precondition related to road markings is evident. Not in terms of identification markings (knowledge, skills, experience), but in the sense of weak management, and structuring markings indicating once again that they are not the cause, but their causes are external. The last two cases, related to driver and vehicle, are interdependent as the new engine would not be overloaded by an expert / experienced driver, knowing that it is not advisable to drive at high speed with a new engine. Factors related to driver problem indicate a problem of perception. In conclusion, the causes are predominantly outside the individual, but there are reasons related to perception,

information processing and reaction time (interior of the individual) (Deery, 1999; Ohlhauser, Milloy & Caird, 2011).

4.2. Errors and Consequences of Errors

Table 5. Errors, violations and their consequences regarding young drivers

Item No.	item Description	Errors	consequences
34	If I see a cyclist on the road I slow down because I'm not sure / D will do.	failure	- May confuse traffic; - Can lead to accidents, depending on the number of users.
38	If a pedestrian crosses on the red light I brake suddenly to avoid him.	failure	- May confuse traffic; - Can lead to accidents.
46	I checked the speedometer and I realized that I was driving at greater a speed than allowed.	violation	- Can lead to accidents; - Can lead to problems with the engine.
14	When I thought there were no police cars on the street I turned on the continuous line.	violation	- May confuse traffic; - Can lead to accidents.
6	When the radars were not on the road I drove with a speed higher than the legal one.	violation	- Can lead to accidents; - Can cause damage to the vehicle (eg lead to problems with the engine).
16	Although the road was uneven, I continued to drive fast.	violation	- Can cause damage to the vehicle; - Can lead to accidents.
29	Road marking was inappropriate and I did not notice that bike / pedestrian crossing.	mistake	- Can injure pedestrians / cyclists or cause other types of accidents
21	I went on a one-way street because I did not saw the sign,	violation	- May confuse traffic; - Can lead to accidents.
13	If a pedestrian crosses through an unmarked area I suddenly swerve to avoid him.	failure	- Can lead to accidents.
54	I accelerated to maximum using a new engine.	mistake	-Can damage the components of the vehicle.

As can be seen in Table 5, the consequences can be problems in traffic, injuries to other users or their own person and the cause of damage (from component failure to destruction of the vehicle). In conclusion, the consequences of error may involve human injury, economic costs (damage, destruction of property, vehicles), stress and negative emotions (Zapf, Brodbeck, Frese, Peters & Prumper, 1992).

4.3. Prevention and Management of Errors

The data indicates that young drivers are influenced by other traffic users. This can be linked to the way the roads are designed. Regarding the participation of cyclists in traffic, there are certain areas, specially designed pavement tracks.

However drivers have encountered cyclists traveling on the road. This is a reflection of the reality that bicyclists do not use these tracks for various reasons. One way to prevent errors due to the participation of cyclists in traffic would be a restructuring of the road by building bicycle lanes on a roadway curb protected section. Drivers could thus easily predict the route which cyclists will take. An alternative would be the observation of cyclists by law enforcement. Thus, ensuring that specially designed tracks are used properly. With regard to young drivers, they would be able to create a more accurate perception of the size of the automobile when trying to avoid or give a cyclists more space. Regarding participation of pedestrians in traffic, to ease it, we recommend maintaining a high degree of attention of drivers, regardless of context and traffic rules. By maintaining a comfortable speed for each driver individually, we can see in useful time if pedestrians do not respect traffic rules. Young drivers can drive with a lower speed for a period of time so as to become accustomed with the road. Thus, they can deal with specific traffic. We may also act on other variable, namely the pedestrians. Law enforcement agencies may impose sanctions for violation of rules

Regarding violations committed by young drivers, to achieve a more marked traffic control. Charlton et al. (2002) state that drivers can assess the speed they have by the perception of the external enviroment . They should be motivated to control their speed by consulting the speedometer more often if they know that they will be punished and that the road is supervised by law enforcement. A constant surveillance with modern technologies (cameras with radar) could reduce the number of traffic violations made by drivers.

Participants in the study, as mentioned, despite uneven road, continued to drive without reducing speed. This issue requires further studies. It is needed to determine the areas where these bumps are present on the route (in town, out of town, rural areas) and frequency. To avoid this type of error adequate signage of the area and adequate lighting id needed. The present study did not investigate the reasons why drivers continued to drive without reducing speed. These could be multiple: did not observed bumps and did not have time to react, the way they were familiar and aware of the risk level, etc.

Regarding road markings, the recommendation of Charlton et al. (2002) can be applied. Road markings can accommodate a larger size to be seen more easily and from a greater distance, having enough time to understand them and react accordingly. It was the aim of this study to investigate the reasons for which marks were observed. There could be multiple causes: Improper placement of the marking, new positioned markings, etc.. The authorities can try a suitable location of markings. Setting the angle of the cars that come in contact with that marking can decide the position that drivers so as to have time to make a decisions without leading to congestion. Drivers may be familiar with the new markings. We can appeal to a database to email drivers with new labels and a brief description of them in terms of traffic implications. To avoid misuse of a car that has new components a greater familiarity with the technical side is required. This can be done during driving school. A first limit is the sample used in this study, which was small (N = 29) and it was relatively unbalanced (predominantly women, 20

participants). An important limitation may be considered the external validity (whether the results can be extended to the general population and ecological validity). Because the sample used was a convenience one, the results can not be extended to the general population. Another limitation is the validity and the reliability of the instrument used.

This instrument has not been validated on the Romanian sample, presenting problems related to reliability and internal consistency. The fact that the issues studied were measured by a self-management questionnaire, increase the risk of social desirability of responses or overestimation skills (Deery, 1999; Mynttinen et al., 2009). Also, no items were reversed (which could reduce social desirability). The practical implications of the results are that the research sought to identify the problems faced by young drivers, on a Romanian sample. Thus, it is relevant that the conditions and importance of errors found in the research be highlighted, so as to design and construct projects, courses, workshops, seminars, programs and accident prevention campaign for young drivers (Fernandes, Job & Hatfield , 2007).

The theoretical implications of this paper attempts the analyze of errors starting from an international taxonomy (Salmon et al., 2006), which allows to discover the differences and peculiarities existing in a sample of Romanian young drivers, students, compared with studies realized on foreign populations. The study exposed a series of conditions, possible errors and consequences that can be used to construct a taxonomy of terms and errors centred on the Romanian population. The research opens new directions for guidance on the concepts used.

As future directions, given that this research has focused on the study of the conditions and errors in the form of statements that directly associate certain conditions with certain errors, it is recommended to design and construct a questionnaire to be able to analyze the conditions and errors separately.

Also, it is suggested to study whether these conditions and errors commonly occur in the entire population of students, regardless of their specialization. It may take into account factors such as weather conditions, model, age and size of the vehicle, the driver's health (rest, medication, consumption of coffee or hallucinogens), age, gender, experience and question type of the route (urban, rural, highway, winding, unpaved road).

In conclusion, this study provides a significant contribution in that it highlights the prevalence of certain conditions (factors related to other road users, road infrastructure related factors, factors related to driver and vehicle related factors) and errors in the driver young, a lot of Romanian students.

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SUMMARY

Studiul are ca scop analiza celor mai frecvente erori produse de conducătorii auto începători/novice/tineri în activitatea de condus pe un lot de 32 de studenți sau masteranzi ai Facultății de Psihologie și Științele Educației, Universitatea din București. Dintre aceștia 29 fac parte din grupul de participanți (20 de femei și 9 bărbați) și 3 din grupul de experți (2 femei și 1 bărbat). Participanților li s-a aplicat un singur chestionar. Chestionarul privind Erorile în Activitatea de Șofat (CEAS) a fost proiectat și construit în cadrul studiului. Chestionarul este construit pornind de la taxonomia propusă de Salmon, Regan și Johnston (2006). Rezultatele studiului relevă faptul că majoritatea erorilor realizate de șoferii tineri sunt cauzate de problemele ce țin de ceilalți utilizatori ai drumului și de absența percepută a organelor de lege. Studiul evidențiază prevalența anumitor condiții și erori la nivelul șoferului tânăr. Sunt discutate implicațiile teoretice și practice ale rezultatelor, limitele studiului și direcțiile viitoare propuse.