



## Oponentní posudek disertační práce

<b>Uchazeč:</b>	<b>MSc. Marjana Čubranić-Dobrodolac</b>
<b>Název disertační práce:</b>	<b>A DECISION-MAKING MODEL FOR EXPLAINING DRIVER BEHAVIOR</b>
<b>Oponent:</b>	<b>Ing. Jindřich Frič, Ph.D.</b>
<b>Pracoviště oponenta:</b>	<b>Centrum dopravního výzkumu, v. v. i.</b>

Oponent se v posudku vyjádří:

- k aktuálnosti daného tématu,
- ke zvoleným metodám zpracování,
- zda práce splnila sledovaný cíl,
- k výsledkům disertační práce s uvedením, zda a jaké nové poznatky přinesla,
- k významu pro praxi nebo rozvoj vědy,
- zda disertační práce splňuje podmínky tvůrčí vědecké práce pro udělení titulu Ph.D.

Ke každému z níže uvedených bodů je nutno doplnit stručný komentář.

a) Aktuálnost tématu disertační práce		
<input checked="" type="checkbox"/> velmi aktuální	<input type="checkbox"/> aktuální	<input type="checkbox"/> není aktuální
<p>Komentář: The thesis focuses on the field of road traffic safety, particularly driver behaviour. Understanding the specifics of driver behaviour with the possibility of following intervention is currently a very important and topical area. The author apparently paid more attention to statistical methods than to the issue of safety as such. This is evident from the simplified and relatively strict introduction to the issue. The safety system is "described" by three basic elements: human, vehicle and infrastructure. To some extent, I miss some other commonly used (and probably more complex) views on the road safety system, such as 3E, 4E, 8E and others. I cannot agree with the conclusion about the ratio of the influence of the vehicle factor and infrastructure on the occurrence of accidents in the amount of 0.72% and 3%, respectively; existing literature based on European in-depth accident analyses (GIDAS, OTS, VALT, IGLAD, CZIDAS) confirms the vehicle influence of 2 - 5% and road infrastructure influence 27 - 33% (e.g., PIARC, 2019)( <i>TREAT, John R., et al. Tri-level study of the causes of traffic accidents: final report. Executive summary. Indiana University, Bloomington, Institute for Research in Public Safety, 1979., ANDRES, Josef, Josef MIKULÍK, Jindřich FRIČ et al. Hlubková analýza dopravních nehod : In-depth Analysis of Road Accidents. Brno : Centrum dopravního výzkumu, v.v.i., 2015. 200 s. ISBN 978-80-88074-26-7</i>).</p> <p>With regards to the defined goals, the topic is obviously well chosen.</p>		

b) Zvolené metody zpracování		
<input checked="" type="checkbox"/> vhodné metody	<input type="checkbox"/> málo vhodné	<input type="checkbox"/> nevhodné, zastaralé
<p>Komentář: The thesis deals with a comparative analysis of methods (ADBQ, BIS-11, DAQ, Questionnaire for Self-Assessment of Driving Ability, and the number of accidents). Advanced statistical methods of data processing hierarchical regression analysis are used in the thesis. Input data on the number of accidents (self-reported), age, gender, aggression, impulsivity was used for</p>		

comparison. The research group consisted of 305 drivers (88% male, 12% female), both car drivers and professional drivers. Within the analyses, the author dealt with a number of characteristics of the research group (gender, age, mileage, vehicle category, holding time of driving license, frequency of driving on urban roads). The breakdown of results into these categories may, in my view, reduce the validity of the results, due to the low number of respondents within smaller groups. At the same time, from my point of view, it is not ideal to find out some information using self-reports (data on the number of accidents, determining your maximum speed on certain types of roads, and at the same time determining the maximum speed of other drivers). I perceive this assessment as partly inaccurately affected (by the social desirability of the answer and a large distortion in terms of possible errors in the estimate). From my point of view, this input data may lead to a significant distortion of the results. The justification of the above mentioned can be proved by findings of the research projects ESRA or SARTRE I - IV. The data analysis is very carefully processed and fully corresponds with the required level of the thesis.

c) Splnění cílů disertační práce

disertace splnila cíl       disertace částečně splnila cíl       disertace nesplnila cíl

Komentář: From my point of view, the goal of the thesis was fulfilled. Using advanced statistical methods, the author was able to come up with a metaheuristic model that aims to clarify the behavior of drivers. This is a strong point of the thesis. I see some shortcoming the input data which author included in the analysis - see the part of the processing method.

d) Výsledky disertační práce, nové poznatky a přínosy

vynikající       nadprůměrné       průměrné       slabé       nevyhovující

The results which the author presents in terms of self-reporting (assessed speed) and the associated tendency to violate the road act is less valuable, from my point of view. I have a similar view of the results regarding the number of accidents. In this part, I perceive self-reporting as an inappropriate tool for finding out the facts. With the help of self-reporting, there is a significant distortion in the sense of the number of statements, which are burdened by the distortion of socially desirable answers (see the part of the data processing method). The ADBQ scale was used to determine driver behaviour. This scale is based on the classical DBQ (Reason et al., 1990). However, this model is referred to by this author only in the section devoted to the discussion, and only very marginally.

The part of the work devoted to data analysis (hierarchical regression analysis) is very precisely processed. The results of the hierarchical regression show a connection between impulsivity, risky (aggressive) behaviour with a higher number of traffic accidents. From the results, it can be stated that impulsivity and aggressive behaviour is a suitable predictive tool for the number of accidents. Several other analyses address areas that may be further related to driver's accidental behaviour. Using the metaheuristic models, the author aims at the construction of a model that would lead to risky behaviour in transport.

e) Význam pro praxi nebo rozvoj vědy				
<input type="checkbox"/> vynikající	<input checked="" type="checkbox"/> nadprůměrný	<input type="checkbox"/> průměrný	<input type="checkbox"/> slabý	<input type="checkbox"/> nevyhovující
<p>Konkrétní přínos: Precisely conducted data analyses, heuristic model of risky driving behaviour.</p> <p>Komentář: Focusing on a model that may predict risky driving behaviour in transport is very important. Many specifics are described, but not always validated. From this point of view, a heuristic model that predicts this type of behaviour is beneficial. I also see the benefit of the work especially in the area of connecting social science research and advanced statistical data processing.</p>				

f) Formální úprava a jazyková úroveň disertační práce				
<input checked="" type="checkbox"/> vynikající	<input type="checkbox"/> nadprůměrná	<input type="checkbox"/> průměrná	<input type="checkbox"/> slabá	<input type="checkbox"/> nevyhovující
<p>Komentář: From my point of view, the formal arrangement of the thesis is fully correct. The author follows the standard structure: theoretical part, research goals, data analysis, results, discussion.</p>				

g) Celkové hodnocení				
Úroveň disertační práce:				
<input type="checkbox"/> vynikající	<input checked="" type="checkbox"/> nadprůměrná	<input type="checkbox"/> průměrná	<input type="checkbox"/> slabá	<input type="checkbox"/> nevyhovující
<p>Disertační práce podmínky uvedené v § 47 odst. 4*) zákona č. 111/1998 sb. o vysokých školách:</p> <p><input checked="" type="checkbox"/> splňuje</p> <p><input type="checkbox"/> nesplňuje</p> <p><small>(*) (4) Studium se řádně ukončuje státní doktorskou zkouškou a obhajobou disertační práce, kterými se prokazuje schopnost a připravenost k samostatné činnosti v oblasti výzkumu nebo vývoje nebo k samostatné teoretické a tvůrčí umělecké činnosti. Disertační práce musí obsahovat původní a uveřejněné výsledky nebo výsledky přijaté k uveřejnění.</small></p> <p>Komentář: In appreciate a precise approach to the elaboration of the dissertation is obvious. I positively evaluate working with data, using statistical methods. I see a certain shortcoming especially in incoming data (and the possibility of influencing the results by these input data). I also perceive certain shortcomings in the theoretical part of the work: here I am lacking a better connection to the concepts of risky behaviour in transport, risk-taking behaviour, or the described personality factors (self-esteem, neuroticism, conscientiousness, etc.). However, the mentioned shortcomings are not as fundamental that they would limit the possibility of further elaboration and application of the thesis findings. The author also documented extensive publishing activities and it can be assumed that she will further develop the topic.</p>				

Dotazy na disertanta: 1. What would be a more appropriate method for road traffic accident data collecting and on the maximum driving speed? 2. What is the author's perception of the connection, if any, of the obtained data and the demerit point system in the Czech Republic?				
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Disertační práci k obhajobě	<input checked="" type="checkbox"/> doporučuji	<input type="checkbox"/> nedoporučuji.
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Datum: 9.3.2021