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# **Driver personality as a valid predictor of risky driving**

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## 1. Background

1. Human being as a controlling system element (consequence:  $\approx 90\%$  of accidents are caused or co-caused by human beings) (e.g. NHTSA, 2015 – 94%,  $\pm 2.2\%$ ).
2. The effectiveness of preventive/educational/diagnostic approaches/measures in improving traffic safety tends to be **strongly overestimated** (Brown et al. (1987); Christie (2001); Christie (2007); Ker et al. (2005); Mayew et al. (1998); Mayew & Simpson (2002); Vernick et al. (1999)).
3. Safe driving as a combination of abilities and motivational factors (will, values, norms) (Will vs. Skill dilemma, Rothengatter, 1997).



## 1. Background

4. Good or poor results in psychodiagnostic tests do not indicate **safe or risky drivers** (context needs to be considered – e.g. the elderly, young drivers' good results in performance tests, etc.).
5. Human behaviour is not 100% predictable – an individual and comprehensive approach to assessment needs to be taken.



## 2. Research design

1. The study sample comprised  $n=2471$  individuals aged 18-87.
2. Psychodiagnostic methods under study:
  1. **Performance tests:** D2, the Bourdon Test, CompACT-Co, CompACT-SR, ATAVT, the Determination Test, the test of decision making and attention, IST (the Memory subtest), VMT, AMT;
  2. **Personality testing methods:** PSSI, NEO-PI-3, SPARO, IHAVEZ, and the Hand test.
3. **Age** was shown to have a significant influence on the results of both performance- and personality-related tests. Therefore, all the results were checked using residual analysis.



## 2. Research design - sample

Two groups – risky drivers and safe drivers – were compiled to conduct validation using contrast groups.

The group of „risky drivers“, comprising:

- drivers who had reached 12 points in the driver demerit system and had their driving licences suspended
- drivers who were banned from driving because they had committed a serious traffic violation or a criminal offence (especially driving under the influence of alcohol or other drugs and speeding)

The group of „non-risky drivers“ (safe), which consisted of drivers who met all the following criteria:

- they were professional drivers
- in their previous driving career, they had not been fined for more than three traffic offences
- they had committed no traffic violations in the past two years, and
- they had never had their driving licenses suspended.



### 3. Key outcomes - performance tests

- **No differences** were found between the risky and non-risky drivers. Moreover, in some of the tests the risky drivers achieved better scores than the non-risky ones (especially in the domain of memory, both verbal and non-verbal).
- In terms of practical implications, it is important to recognise that when assessing psychological fitness to drive, **we cannot predict a person's safe driving behaviour in the future on the basis of their good results in performance tests.**
- In other words, while significantly poor performance may indicate psychological **inelligibility** to drive, the opposite does not apply – **high performance is not a crucial precondition for safe driving, i.e. the basis for a person being certified as psychologically fit to drive.**



### 3. Key outcomes - personality tests

- Statistically significant differences between the risky and non-risky driver groups were shown **for some of the scales of the tests that were used.**
- **The Hand test** seems to have the highest predictive value.
- While these results appear **consistent** across the tests, **it needs to be noted that the differences are not dramatic.**
- **Risky** drivers are: *less deliberate and cooperative and more likely to seek excitement, show less self-control and less respect for responsibilities and commitments, and are more likely to break rules, flout social norms, and assert themselves. They are more preoccupied with their feelings and show a greater sense of their own incompetence and insecurity. They also have a stronger inclination to manipulate others.*



### 3. Key outcomes - NEO-PI-3

- A significant difference was demonstrated on **two of the main scales** (*Agreeableness and Conscientiousness / risky drivers score lower*) and several subscales:
- *Deliberation scale (risky drivers score lower).*
- *Impulsiveness and Excitement Seeking scales (risky drivers score higher).*
- In comparison to the non-risky drivers, the risk driver group also records significantly higher levels on *the Feelings subscale*, i.e. its members are more likely to compete and engage in aggressive behaviour.
- On the other hand, risky drivers show lower levels on the *Straightforwardness, Compliance, and Self-discipline subscales.*





### 3. Key outcomes - PSSI

- The t-test revealed a significant difference between the driver groups in terms of the **Conscientious-Compulsive** personality style. Risky drivers show levels indicative of the signs of a compulsive personality disorder.
- Another significant difference ( $p = 0.006$ ) was found in the **Self-assertive-Antisocial** personality style, which indicates (for risky drivers) a stronger tendency to break rules and social norms and assert their own interests.



### 3. Key outcomes – Hand test

- The aggregate scores showed differences in *the ENV scores*, with higher scores recorded among the group of risky drivers.
- We also found higher scores among the group of risky drivers in relation to the *maladaptive dimensions CRIP, FEAR, and KO and in the DES dimension*.
- The rate of responses given by this group to *the CRIP and DES items* was also significantly higher in relation to the *total number of responses (R)*.
- Thus, risky drivers tend to give less frequent answers, which in terms of this test can be interpreted as a sense of their own incompetence and insecurity and focus on their own feelings. They tend to provide more *descriptive answers (DES)*, which are rather rare among the general population.



### 3. Key outcomes - Traffic psychologists' decision making

- In making their final decisions about a person being **fit or unfit** to drive, traffic psychologists do **not act in line** with the reported predictive capacities of the tests under study.
- In general, psychologists tend to strongly overestimate the performance tests and their predictive value. It means that their final evaluation takes significant account of the results the drivers achieve in these tests, in spite of the fact that the true predictive value of these tests is low.



## 4. Conclusion

1. *Performance tests should be used as an exclusion criterion rather than to predict non-risky driving.*
2. *Personality tests should be used as a source of indicative information in making a comprehensive assessment of a personality based on an interview and a person's driving history.*
3. *The projective Hand test shows good potential.*



## 5. Implementation

*These findings can be implemented within the road safety work as follows:*

- *Selection of the professional drivers*
- *Psychological fitness to drive assessment of offending drivers and drivers under rehabilitation programmes (before the end of licence suspension)*
- *Driver training and education (stress on the motivational factors, skills)*



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# Thank you for listening.

## Questions?



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