



Increasing safety through psychological testing

Johannes Föls - Lindemann

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Application areas

Clinical neuropsychology

Personnel psychology / HR

Traffic psychology

Sports psychology

Despite advancing automation, humans remain an important safety factor



In 2021, there were **1,400 rail accidents** in the EU. (Statista, 2023)



Passing warning signals is one of the **most common causes of accidents** in railroad operations. (RSSB, 2015)



85% of these incidents are **due to human error.**
(May et al., 2011)



Train derailment in Santiago de Compostela (2013)

Train collision in Czech Republic (2021)

There are specific psychological requirements for train drivers

more detailed and comprehensive

	EU Directive 2007/59/EC	Community of European Railways (CER) and European Transport Workers' Federation (ETF)
Cognition	<ul style="list-style-type: none">• Logical reasoning• Attention and concentration• Memory• Ability to react• Perception• Eye-hand coordination	<ul style="list-style-type: none">• Logical reasoning• Attention and concentration• Memory• Ability to react• Perception• Eye-hand coordination• Reactive stress tolerance• Verbal ability (communication)
Personality	<ul style="list-style-type: none">• Security-relevant personality dimensions	<ul style="list-style-type: none">• Emotional self-control and stress tolerance• Reliability• Conscientiousness• Willingness to communicate

The relevance of these requirements is scientifically confirmed

- Guo et al. (2019): Ability to work attentively or with concentration is most strongly related to safety behavior.
- Hickey et al. (2017): Logical reasoning and verbal ability are significant for train simulator performance.
- Hani Tabai et al. (2018): Train driver accident rate is related to sustained attention/concentration performance.
- Chu et al. (2019), Guo et al. (2016): personality traits such as conscientiousness, agreeableness, or extraversion are related to safety behaviors and risky driving behaviors, respectively.



Cognition and driving safety: How does the high-speed railway drivers' cognitive ability affect safety performance?

Selecting high performing train drivers: the role of attention and cognitive flexibility

Anthea HICKEY, Michael COLLINS and Christopher JACKSON

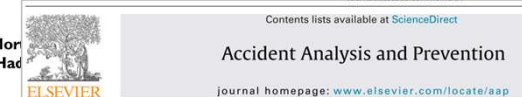
University of New South Wales Business School, Australia

drivers has been
mship has been
by a vital role in
s of great signifi-
cance of high-
standard driving
safety performance

Impact of Train Drivers' Cognitive Responses on Rail Accidents

Bahareh Hani Tabai¹, Mor
Vahideh Shahidi², and Had

Abstract
Despite the innovations in automatic train control, accidents still occur due to defects in these systems. This paper studies the impact of personality traits on the occurrence of rail accidents. A sample of 56 train drivers with a miniaturized test system including WAFV (percentage of correct responses) was used.



The impact of personality on driving safety among Chinese high-speed railway drivers

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JOURNAL OF TRANSPORTATION SAFETY & SECURITY
<https://doi.org/10.1080/19439962.2019.1579289>



Check for updates

Work-family conflict, personality, and safety behaviors among high-speed railway drivers

C L E I N F O

Received 11 October 2014
in revised form 21 February 2016
18 March 2016
online 29 March 2016

ABSTRACT

This study explored the impact of personality traits on driving safety in high-speed railway drivers in Beijing. A sample of high-speed railway drivers in Beijing (N=214) completed a questionnaire to characterize participants based on five personality traits: Neuroticism, Openness to Experience, and Conscientiousness. The survey data were used to

Psychological assessment ensures safety

- ✓ Prospective train drivers must provide evidence of their suitability in terms of their **psychological characteristics**.
- ✓ Active train drivers are **periodically tested** for their suitability
- ✓ **SARAIL** as a tool for checking the fitness to drive of train drivers

VIENNA TEST SYSTEM

www.schuhfried.at

Including interview guidelines

Report **SARAIL**

Candidate: Karin Mittelmaß
Date of testing: 3/24/2016

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SARAIL as a tool for checking the fitness to drive of train drivers

- ✓ Verifies that the requirements for train driver according to the EU Directive, CER, and ETF are met.
- ✓ Particularly economical and valid testing option
- ✓ High prognostic validity



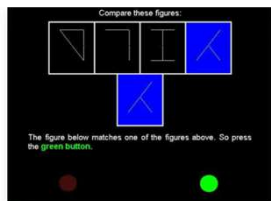
116 minutes



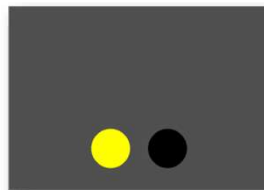
10 tests



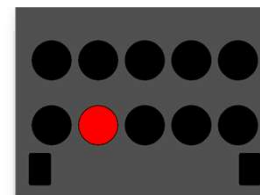
Test Dimensions of SARAIL



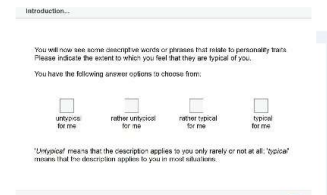
Attention



Ability to react



Stress tolerance



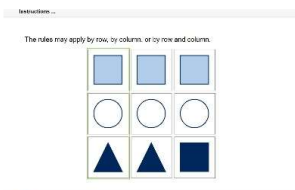
Personality



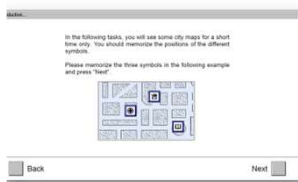
Vigilance



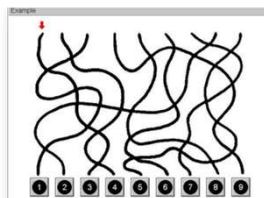
Visuomotor coordination



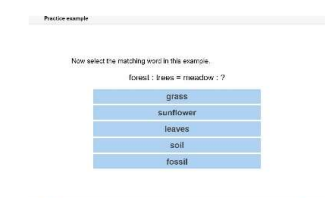
Logical reasoning



Short term memory



Visual orientation



communication

Three evaluation methods are available for SARAIL

Individual scoring

Integration WAF
Date of birth: 1/1/1990 male 28.7 Years Education level 5
SARAIL Safety Assessment Rail
Date: 8/28/2018 Start of testing: 8:31 AM Duration: 65 min.
Language of test presentation: German

Test results

Test variable		Raw score	Param.	PR
Cognitive abilities				
Memory	Short-term	4.821		100
Logical reasoning	Short form	4.059		100
Verbal ability	Short form	2.944		96
Stress tolerance and ability to react				
Stress tolerance, reactive	reactive	203		22
Reaction ability, simple	Motor speed	120		85
	Reaction speed	349		90
Attention and concentration				
Concentration		1.470		100
Vigilance	Visual	528.21		10
Sensomotor functions and perception				
Eye-hand coordination	Two-dimensional	21.70		89
Visual perception		40		92
Determinants of personality				
Emotional stability	Short form	0.767		83
Extraversion	Short form	0.690		82
Conscientiousness	Short form	0.066		59
Openness	Short form	0.317		67
Agreeableness	Short form	0.407		56

Numerical

Word-Report

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TEST RESULTS

SARAIL
Safety Assessment Rail

Candidate
Karin Mittelmaß

Test date
8/28/2018

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partner for psychology
Report # 01.01.02.

Numerical and verbalized

Premium-Report

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Including interview guidelines

Report SARAIL
Candidate: Karin Mittelmaß
Date of testing: 3/24/2016



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partner for psychology

chargeable

SARAIL simplifies your application process



500 people apply for the job.

Applicants' resumes are reviewed to determine if they meet the must-have criteria.



250 people meet the requirement profile according to the curriculum vitae.

SARAIL shows which applicants really have the necessary skills.



The best 100 applicants will be invited for a testing with SARAIL.

In order to select the applicants, a screening is given.



Thank you for your interest!



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