АКТУАЛНО
CURRENT TOPICS

INTRODUCTION TO TRAFFIC PSYCHOLOGY AND INDIVIDUALLY SELECTED TRAFFIC PSYCHOLOGY TOPICS

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Abstract: *Fastenmeier and Gstalter (2021, p. 8) describe traffic psychology as the science of the behavior of road users. In summary, traffic psychology is an application-oriented discipline. It attempts to transfer the basic findings of psychology to mobility and road traffic (Fastenmeier & Gstalter 2021). Current research topics in traffic psychology include, among others, distraction in traffic, aggression in traffic, and for example the special group of older road users. Discussions often take place about older road users as a high-risk group. According to current studies, for instance, age alone does not justify doubts about driving ability (Fastenmeier & Gstalter 2021, p. 165). However, when the actual mileage is taken into account and a distinction is made between frequent and infrequent drivers, a different picture emerges. Irrespective of age, infrequent drivers who cover less than 3,000 kilometers a year have a significantly higher accident risk than frequent drivers who cover more than 3,000 kilometers a year. Among frequent drivers, senior citizens have the lowest accident risk. On the other hand, senior citizens aged 75 and over, who drive less than 3,000 kilometers annually, have an elevated risk of accidents.*
Keywords: *Traffic psychology, distraction in traffic, aggression in traffic, older road users*

INTRODUCTION

"Traffic psychology is concerned with the experience and behavior of people in traffic, transportation, and mobility systems and the underlying psychological processes" (Vollrath & Krems 2011, p. 14). Traffic psychology has a long scientific tradition and is one of the oldest psychological disciplines. Some of the first empirical studies in psychology dealt with traffic-related issues (Münsterberg 1913). Since then, traffic psychology in German-speaking countries has focused on the diagnosis, counseling, rehabilitation, and retraining of drivers with driving problems. A small area of research and practice focuses on mobility, behavior in road traffic, road safety, vehicle and road environment design. Overall, this is an interdisciplinary field, an innovative research area with its own methodology and theoretical approaches. It is therefore worth considering a more detailed definition:

"Traffic Psychology can be understood as a cross-sectional discipline of general and applied psychology with strong links to industrial and engineering psychology. Its cognitive interest is fundamental, application-oriented, and thus practice-oriented. The focus is on the experience and behavior of people in traffic and transportation systems and the underlying psychological processes. It is an innovative research field with its own methodology and theoretical approaches. From the beginning it has had a strong interdisciplinary orientation. In particular, there are points of contact with engineering, medicine, and law" (Fastenmeier 2019). Overall, traffic psychology is therefore an applied discipline, as it aims to "apply the basic findings of psychology to transportation and mobility" (Fastenmeier 2019). In short, Fastenmeier and Gstalter (2021, p. 8) describe traffic psychology as the science of the experience and behavior of road users.

RESEARCH METHODOLOGY

Fields of Traffic Psychology

The domains of activity in transportation psychology are very diverse and can be roughly divided into three areas. These are based on the subfields of occupational psychology:

1. analysis and evaluation of people, activities, and the transportation environment
2. implementation in design, intervention and development
3. analysis, design and intervention with regard to the effects and consequences of the transport system.

To answer traffic-psychological questions, e.g. how often road users are distracted by smartphones and how dangerous this is, different research-methodological approaches are used: surveys, interviews, observations, simulator and laboratory studies, naturalistic driving behavior observations, as well as accident statistics.

The research methodology will principally consist of selected descriptive case studies from the practical work of assessment in the field of traffic psychology. For this purpose, interviews will be conducted, transcribed, and then evaluated and interpreted using qualitative content analysis according to Mayring (2015). Seven individual cases from the daily work of traffic psychology were selected, which are intended to illustrate the various facets of aggressive behavior in traffic.

RESULTS

Individually Selected Traffic Psychology Topics

A primary responsibility of traffic psychologists is to analyze traffic behavior. The subsequent section, therefore, will provide a comprehensive overview of individually selected traffic psychology topics.

Distraction in traffic

Distraction is an often underestimated source of danger in traffic. Active participation in road traffic, whether as a cyclist, pedestrian or driver, requires full concentration and attention at all times. A brief moment of inattention can lead to risky driving, dangerous traffic situations or even accidents. Distractions can come in many forms: visual, auditory, physical, and cognitive: reading a text message, for example, involves elements of visual, cognitive and physical distraction. The consequences can be poorer vehicle control, delayed reactions and less attention to relevant visual information, e.g. missing important information due to too short a look at the road, narrowing of the field of vision and increased mental stress. People often try in vain to compensate for the effects of distraction by driving more slowly.

Aggressive behavior in traffic

The atmosphere on the roads is often characterized by tension and hostility. Headlines such as these are frequently reported in the media. Aggressive behavior can manifest in various forms, including jostling, tailgating, and flashing lights. This phenomenon appears to be pervasive in daily life. To develop a scientific approach to understanding and addressing aggressive behavior in road traffic, it is essential to address the following questions: What is the definition of aggressive behavior? What is the prevalence of aggressive behavior in road traffic? What measures can be taken to reduce aggression?

Definition of aggression in traffic

Aggressive behavior can be conceptualized as a motivation to inflict physical or psychological harm upon objects or individuals. The current emotional state and triggers of aggression can play a role in this. Herzberg and Schlag (2006) proposed a two-type taxonomy of aggression in road traffic: instrumental aggression, defined as a form of aggressive behavior that entails the acceptance of harm, and affective aggression, characterized as hostile behavior aimed at deliberately inflicting harm on others. Notably, the scientific community has yet to reach a consensus on a unified definition of aggressive behavior.

A more neutral term is "traffic climate", which refers to how road users perceive and evaluate interactions in road traffic. This concept focuses not only on negative aspects, but also on positive interactions (e.g., considerate behavior) (Holte 2021).

There is no reliable data on the extent of aggressive behavior in road traffic and its risk potential. Reports of an increase in aggression may be influenced by media coverage and public awareness, not necessarily reflecting actual changes. Regular surveys on the traffic climate provide more useful information for road safety work.

What causes aggressive behavior in traffic?

The etiology of aggressive behavior in the context of road traffic is multifaceted, with the primary causes attributable to either individual characteristics or situational factors (Klimmt et al. 2014). Among

the individual-level factors, gender and age have been demonstrated to influence aggression in road traffic. Specifically, young men exhibit a higher propensity for aggressive behavior compared to female and older road users. Furthermore, personality traits such as carelessness, anger, impulsiveness, and a narcissistic personality structure have been identified as contributing factors to aggression. The willingness to act aggressively can be heightened by strong negative feelings, such as anger or rage. Additionally, a lack of impulse control and empathy have been identified as significant contributors to aggressive behavior.

Furthermore, an aggressive and confrontational approach to stress has been shown to be associated with an increased frequency of traffic violations and a higher probability of involvement in accidents (Evers 2009). However, it is not yet possible to directly determine how often aggressive driving is the cause of an accident.

Older road users

The increasing number of older road users has brought with it a challenge for society: ensuring their safe mobility for as long as possible (Fastenmeier & Gstalter 2021, p. 149). This project is very important because it helps people be more active in their communities and improves their lives. When thinking about stopping to drive and having mandatory fitness-for-driving tests based on age, it is important to consider how this might affect the quality of life of the elderly. For instance, research has shown that older people who stop driving report a decrease in the frequency of trips, an increase in depressive symptoms, and a decline in cognitive abilities and physical functioning. In view of these results, it is important to prioritize maintaining older adults' ability to drive, while emphasizing the importance of road safety. It is also noteworthy that older adults are increasingly cycling and walking, underscoring the need for comprehensive strategies that address the interplay between mobility, age, and road safety.

Accident analysis

The investigation of accident statistics reveals that older road users are involved in a significantly lower number of accidents when compared to other age demographics. The risk of being involved in an accident, as measured by accidents per kilometer driven per year, is comparable to that of individuals between the ages of 25 and 29. However, when the risk of fatality is considered, it is analogous to that of individuals between the ages of 21 and 24. However, this risk remains significantly lower than that observed among the particularly vulnerable 18 to 20-year-olds.The heightened risk of fatality in accidents can be attributed, at least in part, to the increased vulnerability of older individuals, a phenomenon referred to as the "frailty bias". A distinction can be made between two groups: those who drive less and those who drive more. Notably, infrequent drivers, defined as those who travel less than 3,000 kilometers annually, exhibit a considerably elevated mileage-related accident risk in comparison to frequent drivers, who travel more than 3,000 kilometers per year. Among frequent drivers, senior citizens demonstrate the lowest accident risk. The heightened accident risk observed among senior citizens is confined to infrequent drivers, particularly those aged 75 and above. The reduced mileage among older drivers is primarily attributable to alterations in driving habits, such as the transition to retirement and the potential decline in performance resulting from illness or advanced age.

Loss and compensation of performance

Aspects of cognitive performance demonstrate a tendency to decline with age. Sensory abilities are often reported to be reduced by older people, including reduced contrast perception, slowed dark adaptation, increased sensitivity to glare, and a slowed speed of accommodation. Cognitive functions are often impaired by older people, including the efficiency of the usable field of vision, information processing speed, the fading out of irrelevant stimuli, the switching of attention between tasks, and the estimation of speed. Motor skills are also impacted, manifesting as reduced speed and limited mobility of the cervical spine. A significant challenge for many older individuals is the processing of complex traffic scenarios. The leading causes of accidents involving older individuals include failure to yield at intersections, incorrect lane changes, and improper turns or lane changes. As individuals age, the probability of developing medical conditions also rises, frequently necessitating medication. These changes can have a detrimental effect on

road safety. However, it is crucial to note that the decline in performance cannot be regarded as affecting all areas of functioning, nor as a universal decline in abilities that affects all individuals. Consequently, chronological age alone is not a reliable predictor of an older individual's performance and accident risk. Instead, it is the correlation between age-related deficits and often gradual illnesses that lead to an increased safety risk in traffic.

Another theoretical framework pertains to the concept of selective optimization through compensation (SOC), proposed by Baltes and Baltes (1989). This model elucidates a process of effective adaptation to the challenges associated with the aging process. The SOC model is predicated on the life-span concept, which posits the occurrence of gains and losses during the course of aging. In the SOC model, the concepts of aging and success are not regarded as mutually exclusive. The prevailing cultural narrative often portrays aging as a period of decline, marked by losses and limitations, while youth is often associated with upward mobility, success, and gains. According to Baltes and Baltes (1989), reserves and resources are present in old age and can be further developed. The SOK model posits three central adaptation processes: selection (choosing, focusing), optimization (practicing, training), and compensation (tricking, balancing).These processes will be elaborated upon using a practical example. The pianist Arthur Rubinstein, who demonstrated the capacity to perform his piano compositions with a seemingly consistent level of proficiency, irrespective of his age. This ability was attributed to the implementation of specific strategies: he curated his performance repertoire to encompass a select number of pieces (selection), he engaged in more intensive and focused practice regimens for the remaining pieces (optimization), and he strategically played passages that were followed by faster passages more slowly, thereby creating the perception of increased speed (compensation).

In general, older adults tend to compensate for existing deficits, which involves adapting to age- or illness-related performance declines and adjusting their behavior accordingly. This may include reducing driving frequency, avoiding rush hour, and driving more slowly. The loss of performance due to age and illness increases the risk of accidents if adequate compensatory measures are not in place. The prerequisites for adequately compensating for reduced performance include recognizing and accepting one's own deficits, correctly assessing one's own fitness to drive, and knowing alternative forms of mobility.

Possible measures to improve road safety

A mandatory fitness test for older car drivers over a certain chronological age cannot be justified on the basis of accident figures and scientific findings, as the benefits of such tests, which are already carried out in many countries, have not yet been proven. Strict measures mean that senior citizens increasingly participate in traffic as cyclists or pedestrians and are therefore less protected than in a car. This can have the effect of increasing the risk of accidents for older people.

There do not appear to be any individual personal or biographical characteristics of older drivers that could be used to predict an increased risk of accidents. Nor do medical tests and results of psychometric performance tests allow any predictions to be made about this, as there is a lack of scientific evidence for a criterion-valid prediction of the practical driving competence of older drivers based on test results.

If an older person's driving competence is in question, a driving behavior observation drive is currently considered the gold standard and therefore the best method to check driving fitness. A supplementary practical driving test as part of a driving behavior observation test is therefore often recommended to further check the driver's ability to compensate. This can then be used to check whether any psycho-physical performance deficits identified by the test psychologist can be compensated for by a careful and experienced driving style when participating in real road traffic.

CONCLUSION

Future strategies for improving the road safety of older people should not only focus on their performance deficits, but above all on their individual safety potential. These include: Compensatory behavior, experience, safety-related attitudes, greater safety awareness, ability to learn.

Approaches to improving the road safety of older road users include, for example Targeted advice and voluntary health checks by doctors, for example, offering voluntary driver training, providing tools for better self-assessment ("self-test"), better labeling of potential impairment due to medication, reducing

mobility requirements, for example, removing barriers, finding simple solutions in traffic planning and control, support through driver assistance systems.

The active mobility of senior citizens as cyclists and pedestrians should also be strengthened. Here, training programs can help senior citizens to "dare" to get on their bikes or feel safer as pedestrians. However, the traffic environment should also be designed in such a way that senior citizens can move around safely (e.g. sufficiently long green phases at traffic lights, safe crossing points, wide cycle paths).

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ВЪВЕДЕНИЕ В ПСИХОЛОГИЯ НА УЧАСТНИЦИТЕ В ТРАФИКА И ОТДЕЛНО ИЗБРАНИ ТЕМИ ОТ ПСИХОЛОГИЯТА НА УЧАСТНИЦИТЕ В ТРАФИКА

Резюме: *„Психологията на движението се занимава с преживяванията и поведението на хората в системите за движение, транспорт и мобилност, както и с лежащите в основата им психологически процеси" (Vollrath & Krems 2011, с. 14). Fastenmeier и Gstalter (2021, с. 8) описват психологията на движението като наука за поведението на участниците в движението. В обобщение, психологията на движението е дисциплина, ориентирана към приложение. Тя се опитва да пренесе основните открития на психологията към мобилността и пътното движение (Fastenmeier & Gstalter 2021). Актуалните изследователски теми в психологията на пътното движение включват, наред с другото, разсейването в пътното движение, агресията в пътното движение и например специалната група на по-възрастните участници в движението. Често се водят дискусии за по-възрастните участници в движението като високорискова група. Според актуални проучвания например възрастта сама по себе си не оправдава съмненията относно способността за шофиране (Fastenmeier & Gstalter 2021, с. 165).*

Ключови думи: *психология на движението, разсейване на вниманието в движението, агресия в движението, по-възрастни участници в движението*

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