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Číslo 1



Tématické celky:

- [Accidents, Safety and Human Error](#)
- [Attentional Processes](#)
- [Biomechanics, Anthropometry, Work physiology](#)
- [Cognitive Processes](#)
- [Computer Systems](#)
- [Displays and Control](#)
- [Health and Medical Systems](#)
- [Individual Differences](#)
- [Surface Transportation Systems](#)

ACCIDENTS, SAFETY, AND HUMAN ERROR

Morel, Gaël; Amalberti, René; Chauvin, Christiane. *Articulating the Differences Between Safety and Resilience : The Decision-Making Process of Professional Sea-Fishing Skippers. S. 1-16(16).*

Abstract: Objective: As the world's most dangerous profession, sea fishing enables discussion of the concept of resilience and its articulation to the notion of safety in complex systems. **Background:** In the small, emerging community working on this concept, the prevailing idea to improve safety is that resilience must be reinjected into the know-how of complex systems. **Method:** Thirty-four male skippers, divided into two groups, took part in an interactive simulation of a fishing campaign. They had to make decisions in situations of trade-off between safety and production goals. **Results:** From the time they left the harbor, the fishermen never gave up on fishing, even in extreme conditions, and regardless of whether or not the catch was good. Not being suicidal, however, they used multiple expert strategies to reduce risk without giving up on their fishing activity. **Conclusion:** Systems run by craftspeople are very resilient because they rely on a high level of adaptability, based on the actors' expertise, linked to an exposure to frequent and considerable risk. Each actor is responsible for his or her own safety. The final discussion bears on the question of knowing whether or not it is possible to design a safe system while preserving its craftsmanship and therefore its native resilience. **Application:** The results of these studies suggest potential adverse effects of classic safety interventions in complex sociotechnical systems either in terms of professional

reluctance to accept new recommendations or through the emergence of new sources of risk.

- **Keywords:** SOCIO-TECHNICAL SYSTEMS; MARITIME; ACCIDENTS; COMPLEX SYSTEMS; HUMAN ERROR

ATTENTIONAL PROCESSES

Ferris, Thomas K.; Sarter, Nadine B. *Cross-Modal Links Among Vision, Audition, and Touch in Complex Environments. S. 17-26(10).*

Abstract: Objectives: This study sought to determine whether performance effects of cross-modal spatial links that were observed in earlier laboratory studies scale to more complex environments and need to be considered in multimodal interface design. It also revisits the unresolved issue of cross-modal cuing asymmetries. **Background:** Previous laboratory studies employing simple cues, tasks, and/or targets have demonstrated that the efficiency of processing visual, auditory, and tactile stimuli is affected by the modality, lateralization, and timing of surrounding cues. Very few studies have investigated these cross-modal constraints in the context of more complex environments to determine whether they scale and how complexity affects the nature of cross-modal cuing asymmetries. **Method:** A microworld simulation of battlefield operations with a complex task set and meaningful visual, auditory, and tactile stimuli was used to investigate cuing effects for all cross-modal pairings. **Results:** Significant asymmetric performance effects of cross-modal spatial links were observed. Auditory cues shortened response latencies for collocated visual targets but visual cues did not do the same for collocated auditory targets. Responses to contralateral (rather than ipsilateral) targets were faster for tactually cued auditory targets and each visual-tactile cue-target combination, suggesting an inhibition-of-return effect. **Conclusions:** The spatial relationships between multimodal cues and targets significantly affect target response times in complex environments. The performance effects of cross-modal links and the observed cross-modal cuing asymmetries need to be examined in more detail and considered in future interface design. **Application:** The findings from this study have implications for the design of multimodal and adaptive interfaces and for supporting attention management in complex, data-rich domains.

- **Keywords:** CROSS-MODAL LINKS IN ATTENTION; MULTIMODAL DISPLAYS; CROSS-MODAL SPATIAL CUING; CROSS-MODAL CUING ASYMMETRIES; CROSS-MODAL INHIBITION OF RETURN; MULTIMODAL INTERFACE DESIGN; ATTENTIONAL PROCESSES

Český abstrakt: Studie má stanovit, zda působení těchto prostorových vazeb, které byly pozorovány v dřívějších laboratorních studiích, je použitelné pro složitější prostředí a může být vzato v úvahu pro multimodální design rozhraní. Bylo pozorováno významné asymetrické výkonnostní působení transmodálních vazeb. Prostorové vztahy mezi multimodálními cíli významně zasahuje čas na cílovou odpověď.

- zrak - sluch - vazby - prostředí

BIOMECHANICS, ANTHROPOMETRY, WORK PHYSIOLOGY

Hsiao, Hongwei; Hause, Mathew; Powers, John R.; Kau, Tsui-Ying; Hendricks, Scott; Simeonov, Peter I. *Effect of Scaffold End Frame Carrying Strategies on Worker Stepping Response, Postural Stability, and Perceived Task Difficulty. S. 27-36(10).*

Abstract: Objective: This study determined the most favorable strategy for carrying scaffold end frames while minimizing the risk of injuries from being struck by an object,

falling, and overexertion. **Background:** Scaffold erectors are at risk of high exposure to the aforementioned hazards associated with the dynamic human-scaffolding interface and work environments. Identifying an optimal work strategy can help reduce risk of injuries to the worker. **Method:** Three carrying methods, four types of work surfaces, two weights of scaffold frames, and three directions of stepping movement were tested in a laboratory with 18 construction workers. **Results:** The effects of carrying method on postural instability and task difficulty rating were significant for handling the 22-kg end frame. Response time, postural instability, and perceived task difficulty rating were significantly reduced when the 9-kg end frame was used as compared with the 22-kg frame. **Conclusion:** The symmetric side-carrying method was the best option for handling 22-kg scaffold end frames. A 9-kg end frame (e.g., made of reinforced lightweight materials) has the potential to reduce injury risk among scaffold handlers during their scaffold erection and dismantling jobs. **Application:** Scaffold erectors may want to adopt the symmetric side-carrying method as the primary technique for handling the 22-kg scaffold end frame, which is currently the one most used in the industry.

- **Keywords:** FALLS; OVEREXERTION; CONSTRUCTION; RESPONSE TIME; POSTURAL SWAY; BIOMECHANICS; ANTHROPOMETRY; WORK PHYSIOLOGY

Český abstrakt: Studie stanoví nejvýhodnější strategii pro nošení rámu při minimalizaci rizika úrazů. Působení metody nošení na nestabilitu držení těla a obtížnost úkolu bylo významné pro manipulaci s 22 kg rámem, zatím co u 9 kg rámu byla obtížnost významně snížena. Metoda symetrického bočního nesení byla nejlepší volbou pro nošení 22 kg rámu. Nošení 9 kg rámu potenciálně snižovalo riziko při montáži a demontáži lešení.

- lešení - manipulace ruční - rizika bezpečnostní

Seo, Na Jin; Armstrong, Thomas J.; Chaffin, Don B.; Ashton-Miller, James A. *Inward Torque and High-Friction Handles Can Reduce Required Muscle Efforts for Torque Generation. S. 37-48(12).*

Abstract: Objective: The effects of handle friction and torque direction on muscle activity and torque are empirically investigated using cylindrical handles. **Background:** A torque biomechanical model that considers contact force, friction, and torque direction was evaluated using different friction handles. **Methods:** Twelve adults exerted hand torque in opposite directions about the long axis of a cylinder covered with aluminum or rubber while grip force, torque, and finger flexor electromyography (EMG) were recorded. In addition, participants performed grip exertions without torque, in which they matched the EMG level obtained during previous maximum torque exertions, to allow us to determine how grip force was affected by the absence of torque. **Results:** (a) Maximum torque was 52% greater for the high-friction rubber handle than for the low-friction aluminum handle. (b) Total normal force increased 33% with inward torque (torque applied in the direction fingertips point) and decreased 14% with outward torque (torque in the direction the thumb points), compared with that with no torque. Consequently, maximum inward torque was 45% greater than maximum outward torque. (c) The effect of torque direction was greater for the high-friction rubber handle than for the low-friction aluminum handle. **Conclusion:** The results support the proposed model, which predicts a large effect of torque direction when high-friction handles are gripped. **Application:** Designing tasks with high friction and inward rotations can increase the torque capability of workers of a given strength, or reduce required muscle activities for given torque exertions, thus reducing the risk of fatigue and musculoskeletal disorders.

- **Keywords:** HANDLE FRICTION; HAND TORQUE DIRECTION; GRIP FORCE DISTRIBUTION; HAND BIOMECHANICS; HAND ERGONOMICS; ANTHROPOMETRY; WORK PHYSIOLOGY

Český abstrakt: Bylo empiricky zkoumáno působení tření rukojeti a směr točivého momentu na svalovou činnost a točivý moment za použití válcových rukojetí. Bylo zjištěno, že maximální točivý moment byl o 52% větší, stejně jako působení směru momentu, u pryžových rukojetí s vysokým třením než u hliníkových s nízkým třením. Výsledky podporují navrhovaný model.

- moment točivý - rukojeti - tření - námaha fyzická

Straker, Leon; Burgess-Limerick, Robin; Pollock, Clare; Coleman, Jemma; Skoss, Rachel; Maslen, Barbara. *Children's Posture and Muscle Activity at Different Computer Display Heights and During Paper Information Technology Use. S. 49-61(13).*

Abstract: Objective: The 3-D posture and muscle activity in the neck and upper limb were assessed in children using high-, mid-, and book-level displays, which correspond to working conditions frequently observed when children interact with computers or books and paper. **Background:** The 3-D posture and muscle activity of children reading and inputting data with computers and paper had not been previously assessed. **Methods:** Twenty-four children aged 10 to 12 years and of normal height performed an interactive task involving reading from a book and writing on paper or reading from a computer display and inputting data using a mouse and keyboard. **Results:** Head and neck flexion increased as the visual target was lowered. The high display resulted in mainly upper cervical relative extension, and the book display resulted in both upper and lower cervical flexion. The book condition resulted in greater cervical erector spinae and upper trapezius activity than did the mid and high conditions. **Conclusion:** The data suggest that a mid-level display may be more appropriate for children than a high display (e.g., when the display is placed on top of the central processing unit). The mid display also results in a more upright and symmetrical posture and lower mean muscle activity than does working with books and paper flat on the desk. **Application:** This study provides short-term laboratory study evidence for the formulation of guidelines for workstation design and adjustment for children. Use of computers by children is increasing, yet ergonomic guidelines lag behind those for adults.

- **Keywords:** EMG; PHYSICAL WORK; LOADING; BIOMECHANICS; ANTHROPOMETRY; WORK PHYSIOLOGY; COMPUTER SYSTEMS

COGNITIVE PROCESSES

Hollands, Justin G.; Pavlovic, Nada J.; Enomoto, Yukari; Jiang, Haiying. *Smooth Rotation of 2-D and 3-D Representations of Terezin : An Investigation Into the Utility of Visual Momentum. S. 62-76(15).*

Abstract: Objective: The potential advantage of visual momentum in the form of smooth rotation between two-dimensional (2-D) and three-dimensional (3-D) displays of geographic terrain was examined. **Background:** The relative effectiveness of 2-D and 3-D displays is task dependent, leading to the need for multiple frames of reference as users switch tasks. The use of smooth rotation to provide visual momentum has received little scrutiny in the task-switching context. A cognitive model of the processes involved in switching viewpoints on a set of spatial elements is proposed. **Methods:** In three experiments, participants judged the properties of two points placed on terrain depicted as 2-D or 3-D displays. Participants indicated whether Point A was higher than Point B, or whether Point B could be seen from Point A. Participants performed the two tasks in pairs of trials, switching tasks and displays within the pair. In the continuous transition condition the display dynamically rotated in depth from one display format to the other. In the discrete condition there was an instantaneous viewpoint shift that varied across experiments (Experiment 1: immediate; Experiment 2: delay; Experiment 3: preview). **Results:** Performance after continuous transition was superior to that after discrete

transition. **Conclusion:** The visual momentum provided by smooth rotation helped users switch tasks. **Application:** The use of dynamic transition is recommended when observers examine multiple views of terrain over time. The model may serve as a useful heuristic for designers. The results are pertinent to command and control, geological engineering, urban planning, and imagery analysis domains.

- **Keywords:** 2-D DISPLAYS; 3-D DISPLAYS; TOPOGRAPHIC MAPS; TERRAIN MAPS; TASK SWITCHING; BATTLESPACE VISUALIZATION; TACTICAL DISPLAY; COGNITIVE PROCESSES; GRAPHICS; COMPUTER SYSTEMS; DISPLAYS AND CONTROLS; PERCEPTUAL PROCESSES

COMPUTER SYSTEMS

Commarford, Patrick M.; Lewis, James R.; Smither, Janan Al-Awar; Gentzler, Marc D. *A Comparison of Broad Versus Deep Auditory Menu Structures. S. 77-89(13).*

Abstract: Objective: The primary purpose of this experiment was to gain a greater understanding of the utilization of working memory when interacting with a speech-enabled interactive voice response (IVR) system. **Background:** A widely promoted guideline advises limiting IVR menus to five or fewer items because of constraints of the human memory system, commonly citing Miller's (1956) paper. The authors argue that Miller's paper does not, in fact, support this guideline. Furthermore, applying modern theories of working memory leads to the opposite conclusion - that reducing menu length by creating a deeper structure is actually more demanding of users' working memories and leads to poorer performance and satisfaction. **Method:** Participants took a working memory capacity test and then attempted to complete a series of e-mail tasks using one of two IVR designs (functionally equivalent, but one with a broad menu structure and the other with a deep structure). **Results:** Users of the broad-structure IVR performed better and were more satisfied than users of the deep-structure IVR. Furthermore, this effect was more pronounced for those with low working memory capacity. **Conclusion:** Results indicate that creating a deeper structure is more demanding of working memory resource than the alternative of longer, shallower menus. **Application:** This experiment has important practical implications for all systems with auditory menus (particularly IVRs) because it provides empirical evidence refuting a widely promoted design practice.

- **Keywords:** WORKING MEMORY; INTERACTIVE VOICE RESPONSE; IVR; MEMORY CAPACITY; PHONE-BASED SYSTEM; SHORT-TERM MEMORY; SPEECH SYSTEM; AUDITORY INTERFACE; BREADTH VERSUS DEPTH; COMPUTER SYSTEMS

Český abstrakt: Primárním cílem experimentu bylo lépe pochopit použití pracovní paměti při interakci se systémem interaktivní hlasové odpovědi (IVR) schopné řeči. Bylo zjištěno, že uživatelé široké struktury IVR podávali lepší výkon a udávali vyšší spokojenost než uživatelé hluboké struktury IVR. Vytváření hluboké struktury je náročnější na zdroj pracovní paměti než alternativa delšího, mělčího menu.

- hlas - paměť - psychologie práce

DISPLAYS AND CONTROLS

Jones, Lynette A.; Sarter, Nadine B. *Tactile Displays : Guidance for Their Design and Application. S. 90-111(22).*

Abstract: Objective: This article provides an overview of tactile displays. Its goal is to assist human factors practitioners in deciding when and how to employ the sense of touch for the purpose of information representation. The article also identifies important research needs in this area. **Background:** First attempts to utilize the sense of touch as

a medium for communication date back to the late 1950s. For the next 35 years progress in this area was relatively slow, but recent years have seen a surge in the interest and development of tactile displays and the integration of tactile signals in multimodal interfaces. A thorough understanding of the properties of this sensory channel and its interaction with other modalities is needed to ensure the effective and robust use of tactile displays. **Methods:** First, an overview of vibrotactile perception is provided. Next, the design of tactile displays is discussed with respect to available technologies. The potential benefit of including tactile cues in multimodal interfaces is discussed. Finally, research needs in the area of tactile information presentation are highlighted. **Results:** This review provides human factors researchers and interface designers with the requisite knowledge for creating effective tactile interfaces. It describes both potential benefits and limitations of this approach to information presentation. **Conclusion:** The sense of touch represents a promising means of supporting communication and coordination in human-human and human-machine systems. **Application:** Tactile interfaces can support numerous functions, including spatial orientation and guidance, attention management, and sensory substitution, in a wide range of domains.

- **Keywords:** TACTILE INTERFACES; CUTANEOUS SENSATION; MULTIMODAL DISPLAYS; TOUCH; HAPTIC INTERFACES; DISPLAYS AND CONTROLS

Český abstrakt: Článek přináší přehled hmatových displejů. Má napomoci praktikům v oblasti lidských faktorů a konstruktérům rozhraní rozhodnout, zda a jak využít smysl úhozu pro účely znázornění informací a vytváření efektivních hmatových rozhraní. Popisuje potenciální výhody a omezení tohoto přístupu. Smysl úhozu má podpořit komunikaci a koordinaci systémů člověk-člověk a člověk-stroj.

- displeje - hmat - rozhraní - faktor lidský - systém člověk - stroj - informace

HEALTH AND MEDICAL SYSTEMS

Lippa, Katherine D.; Klein, Helen Altman; Shalin, Valerie L. *Everyday Expertise : Cognitive Demands in Diabetes Self-Management. S. 112-120(9).*

Abstract: Objective: To assess the relationship between decision making and successful diabetes self-management. **Background:** Patients with type II diabetes make routine but critical self-management decisions. **Method:** We conducted cognitive task analysis interviews with 18 patients to examine problem detection, functional relationships, problem-solving strategies, and types of knowledge used to make self-management decisions. We expected that these decision processes would be related to behavioral adherence and glycemic control. **Results:** Verbal reports displaying problem detection skills, knowledge of functional relationships, and effective problem-solving strategies were all related to better adherence. Problem detection skill was linked to greater glycemic control. Participants differed in declarative and applied knowledge. **Conclusion:** Diabetes self-management draws on the same cognitive skills found in experts from diverse professional domains. Considering diabetes self-management as a form of expertise may support adherence. **Application:** Human factors approaches that support professional expertise may be useful for the decision making of patients with diabetes and other chronic diseases.

- **Keywords:** COGNITION; COGNITIVE TASK ANALYSIS; NATURALISTIC DECISION MAKING; DECISION MAKING; QUALITATIVE ANALYSIS; PATIENT SAFETY; HEALTH CARE; HOME HEALTH CARE; DIABETES; SELF-CARE; HEALTH AND MEDICAL SYSTEMS

INDIVIDUAL DIFFERENCES

Stankovic, Stéphanie; Raufaste, Éric; Averty, Philippe. *Determinants of Conflict Detection : A Model of Risk Judgments in Air Traffic Control*. S. 121-134(14).

Abstract: Objective: A model of conflict judgments in air traffic control (ATC) is proposed. **Background:** Three horizontal distances determine risk judgments about conflict between two aircraft: (a) Dt_0 is the distance between the crossing of the aircraft trajectories and the first aircraft to reach that point; (b) Dt_h is the distance between the two aircraft when they are horizontally closest; and (c) Dt_v is the horizontal distance between the two aircraft when their growing vertical distance reaches 1,000 feet. **Methods:** Two experiments tested whether the variables in the model reflect what controllers do. In Experiment 1, 125 certified controllers provided risk judgments about situations in which the model variables were manipulated. Experiment 2 investigated the relationship between the model and expertise by comparing a population of certified controllers with a population of ATC students. **Results:** Across both experiments, the model accounted for 44% to 50% of the variance in risk judgments by certified controllers ($N = 161$) but only 20% in judgments by ATC students ($N = 88$). There were major individual differences in the predictive power of the model as well as in the contributions of the three variables. In Experiment 2, the model described experts better than novices. **Conclusion:** The model provided a satisfying account of the data, albeit with substantial individual differences. It is argued that an individual-differences approach is required when investigating the strategies involved in conflict judgment in ATC. **Application:** These findings should have implications for developing user-friendly interfaces with conflict detection devices and for devising ATC training programs.

- **Keywords:** ANTICIPATION; EXPERTISE; DECISION MAKING; NATURALISTIC DECISION MAKING; COGNITIVE PROCESSES; INDIVIDUAL DIFFERENCES

SURFACE TRANSPORTATION SYSTEMS

Lenné, Michael G.; Triggs, Thomas J.; Mulvihill, Christine M.; Regan, Michael A.; Corben, Bruce F. *Detection of Emergency Vehicles : Driver Responses to Advance Warning in a Driving Simulator*. S. 135-144(10).

Abstract: Objective: This research evaluated the effects of an advance warning device (AWD) on the safety of driver interactions with emergency vehicles (EVs). The AWD was intended to provide drivers with advance warning of an approaching on-call EV via visual and auditory warnings when the EV was within a 300- to 400-m radius. **Background:** Research suggests that drivers can experience difficulty accurately detecting the distance and direction of approaching on-call EV. In-vehicle technology has not previously been explored as a means of overcoming the limitations of existing EV lights and sirens and improving driver detection of EV. **Method:** An experimental study using an advanced driving simulator examined the effects of the AWD on driving performance in a range of circumstances in which real-world EV crashes and near-misses commonly occur. Each event contained a combination of scenario type (adjacent lane, turning across, car following) and warning condition (control, standard, advance). **Results:** Data from 22 participants were collected, including measures of speed, braking, and visual scanning. For adjacent-lane and turning-across events, the AWD was associated primarily with reductions in mean speed. The AWD resulted in an earlier lane change to clear a path for the EV in the car-following event. **Conclusion:** The reduction in speed observed was a positive finding, given the relationship between impact speed and injury severity. Response priming emerged as the mechanism underpinning these effects. **Application:** Response priming may result in safety benefits in other settings when an advisory warning is presented before the threat can be perceived.

- **Keywords:** RESPONSE TIMES; ADVISORY WARNING; PRIMING; DRIVING SIMULATOR; IN-VEHICLE TECHNOLOGY; SURFACE TRANSPORTATION SYSTEMS

Merat, Natasha; Jamson, A. Hamish. *The Effect of Stimulus Modality on Signal Detection : Implications for Assessing the Safety of In-Vehicle Technology. S. 145-158(14).*

Abstract: Objective: This study examined the effect of two in-vehicle information systems (IVIS) on signal detection in the visual, auditory, and tactile modalities; established whether the detrimental effects of an IVIS on driving could be quantified by these detection tasks; and examined the effect of stimulus modality on signal detection.

Background: The peripheral detection task has been used widely for assessing the effects of an IVIS on driving. However, performance on this task relies on drivers' ability to see a series of LEDs, which can be problematic in field tests (e.g., on sunny days).

Method: Participants responded to one of three detection tasks during a simulated driving experiment. The effect of IVIS interaction on these detection tasks was also measured. Reduced performance in the detection tasks was assumed to indicate a decline in drivers' ability to handle sudden events in the driving task. **Results:** Response time to all detection tasks increased by around 200 ms when drivers performed the IVIS tasks, as compared with baseline driving. Analyses of variance and comparison of effect sizes showed the effects of these two IVISs to be the same across the three detection tasks. **Conclusion:** These detection tasks are useful for quantifying the safety of an IVIS during driving. The absence of a difference in signal detection by modality suggests that performance on these tasks relies on general attentional resources and is not modality specific. **Application:** The signal detection tasks employed here should be further investigated for their suitability in assessing the safety of in-vehicle systems.

- **Keywords:** DRIVER BEHAVIOR; PERIPHERAL DETECTION TASK; DRIVING SIMULATOR; DRIVER DISTRACTION; IVIS SAFETY; SURFACE TRANSPORTATION SYSTEMS

Český abstrakt: Studie zkoumala působení dvou informačních systémů uvnitř vozidla (IVIS) na zjišťování signálů ve zrakových, sluchových a hmatových modalitách; zda nežádoucí působení IVIS při řízení může být kvantifikováno těmito detekčními činnostmi; efekt stimulační modality na detekci signálů. Bylo konstatováno, že tyto činnosti jsou vhodné ke kvantifikaci bezpečnosti IVIS při řízení.

- systémy informační - vozidla - zrak - sluch - hmat - bezpečnost silniční - signály

Petersen, Andrew; Barrett, Rod; Morrison, Steven. *Enhanced Postural Stability Following Driver Training Is Associated With Positive Effects in Vehicle Kinematics During Cornering. S. 159-172(14).*

Abstract: Objective: The purpose of the study was to examine the effects of a specific post-license driver training program on postural stability and vehicle kinematics during cornering. **Background:** Inertial forces experienced during driving can perturb a driver's posture, which may in turn diminish a driver's perceptual sensitivity and corresponding control actions. **Methods:** A trainee group ($n = 21$) and control group ($n = 12$) participated in the study. The trainee group participated in a 2-day driver training program that included instruction on how to enhance perceptual sensitivity, postural stability, and vehicle kinematics during common driving maneuvers, including cornering. Postural stability and vehicle kinematics were assessed during cornering maneuvers performed on a closed-circuit track using an instrumented vehicle prior to and following training. **Results:** Trainee drivers experienced enhanced postural stability and reduced the magnitude and onset of peak vehicle lateral accelerations following training. Prior to training, drivers who were more posturally unstable tended to experience higher lateral vehicle accelerations, and drivers with the biggest improvements in postural stability

following training tended to experience the greatest reductions in lateral accelerations of the vehicle. **Conclusion:** Training led to changes in postural stability that were associated with reduced lateral accelerations during cornering. **Application:** The reduction in lateral accelerations following training in the present study indicates a greater dynamic margin of safety for cornering. Overall findings suggest that the driver training programs produced beneficial effects on cornering kinematics and that these effects were associated with enhanced postural stability.

- **Keywords:** DRIVER BEHAVIOR; SKILL DEVELOPMENT; LATERAL ACCELERATIONS; VEHICLE DYNAMICS; POSTURAL STABILITY; EXPERIENCED DRIVER; LICENSED DRIVERS; ECOLOGICAL; G-FORCE INERTIA; SEATED POSTURE; STEERING; BIOMECHANICAL ANALYSIS; INFORMATION; PERCEPTUAL-MOTOR SKILL; HAZARD DETECTION; RISK PERCEPTION; PERCEPTUAL SENSITIVITY; PERCEPTION-ACTION CYCLE; ROAD SAFETY; CRASH; ACCIDENT; SURFACE TRANSPORTATION; SYSTEMS

Český abstrakt: Cílem studie bylo vyzkoumat působení specifického výcvikového programu pro řidiče. Bylo zjištěno, že trénovaní řidiči měli zvýšenou stabilitu a omezené boční zrychlení vozidla. Výcvik vedl ke změně ve stabilitě držení těla, což bylo spojeno s omezeným bočním zrychlením během zatáčení. To představuje zvýšení bezpečnosti jízdy pro lepší působení na kinematiku zatáčení.

- bezpečnost silniční - výcvik - řidiči - řízení motorových vozidel - stabilita - polohy těla - držení