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Sylwia Bedyńska & Dorota Żołnierczyk-Zreda. *Stereotype threat as a determinant of burnout or work engagement : mediating role of positive and negative emotions*. Pages 1-8.

Stereotype threat as an example of serious interpersonal strain at workplace can lead either to impaired work engagement or it can motivate workers to strengthen their efforts to disconfirm a stereotype and can result in excessive work engagement. Thus, the basic aim of the study was to examine whether stereotype threat is related to burnout or to work engagement. The mediating role of the negative and positive emotions were also tested in the classical approach. Mediational analysis revealed a linear relation of stereotype threat and burnout, mediated by negative emotions and a quadratic relationship between stereotype threat and work engagement. In the latter analysis none of the mediators were significant. Therefore, the results showed that both burnout and work engagement are associated with stereotype threat at the workplace, probably depending on the stage of response to the stereotype threat. Further research should confirm these associations in a longitudinal study.

- **Keywords:** stereotype threat, burnout, positive emotions, negative emotions, work engagement

Ewan B Macdonald, Shrijana Shrestha, Mahendra Kashari Chhetri, Lahkpa Rangdu Sherpa, Da Gelje Sherpa, Keith Murray & Kaveh A Sanati. *Work-health needs of high-altitude mountain guides (Sherpas) in Nepal : a pilot study*. Pages 9-14.

Much of the research in high-altitude medicine has been concerned with non-indigenous travellers; no study has examined the work-related health issues of high altitude mountain guides (Sherpas) in Nepal. This pilot study was performed to investigate the work-related health issues of people working as Sherpas by evaluating their perceptions of their general health and its relation to work. An occupational and general health questionnaire was tailored for the Sherpas following a focus group with five Sherpa workers. 131 Sherpas participated in this study. Respiratory (60%) and musculoskeletal symptoms (55%) were reported significantly more frequently than other health problems ($p < .05$). 33 Sherpas reported work accident experiences (25%) and 27 (21%) reported eye conditions. This pilot study identified respiratory and musculoskeletal problems as

well as accidents as the main work-related health issues of high altitude climbing Sherpas. Another important finding was the high prevalence of reported eye conditions (21%). Better occupational health and safety arrangements including routine recording of accidents or work-related health problems would give better insight into the health needs of Sherpas.

- **Keywords:** Himalaya, Nepal, occupational health, needs assessment, musculoskeletal symptoms, respiratory symptoms

Audrey Petit & Yves Roquelaure. *1*. Pages 15-19.

Nonspecific low back pain and sciatica are prevalent diseases among working adults and have become a worrying occupational health issue because they sometimes affect continuation or resumption of employment. Epidemiological studies that based questionnaires on workers' healthcare consumption have shown a higher prevalence of these disorders in certain industrial sectors. Thus, low back disorders are usually more prevalent among workers exposed to cumulative lumbar load such as manual handling, awkward postures of the trunk and whole-body vibrations. In addition, morphological and biomechanical studies have compared disc space narrowing and the intensity of lumbar workload. Although debated, the relationship between disc degeneration and biomechanical work exposures seems to be usually accepted by most authors. In response to a considerable need of prevention and compensation for workers, low back pain and/or disc disease can be recognized as an occupational diseases in several countries but the criteria of recognition remains heterogeneous from one country to another.

- **Keywords:** intervertebral disc, occupational disease, low back pain, workload

Issachar Gilad & Eyal Byran. *Quantifying driver's field-of-view in tractors: methodology and case study*. Pages 20-29.

When driving a car, the visual awareness is important for operating and controlling the vehicle. When operating a tractor, it is even more complex. This is because the driving is always accompanied with another task (e.g., plough) that demands constant changes of body postures, to achieve the needed Field-of-View (FoV). Therefore, the cockpit must be well designed to provide best FoV. Today, the driver's FoV is analyzed mostly by computer simulations of a cockpit model and a Digital Human Model (DHM) positioned inside. The outcome is an ‘Eye view’ that displays what the DHM ‘sees’. This paper suggests a new approach that adds quantitative information to the current display; presented on three tractor models as case studies. Based on the results, the design can be modified. This may assist the engineer, to analyze, compare and improve the design, for better addressing the driver needs.

- **Keywords:** field-of-view, simulation, visibility, tractor, off road vehicles safety

Kyung-Sun Lee & Myung-Chul Jung. *Quantitative comparison of marker attachment methods for hand motion analysis*. Pages 30-38.

The purpose of this study was to compare and quantify the angle difference among marker attachment methods for kinematic evaluation. For static evaluation, a hand mock-up was designed and used in single trials of different marker attachment methods. The mean absolute angle difference between the marker attachment methods and hand mock-up was not statistically significant. For dynamic evaluation, the gripping task began when a participant gripped a cylinder. The main effect of the marker set ($p < .049$) was significant. Thus, the use of one marker per joint is recommended for static evaluation because it causes less discomfort when a patient moves his/her hand and because utilizing the same marker placements for each subject is easy. For dynamic evaluation,

the use of three markers per segment or a cluster marker is recommended because they are less affected by skin movement.

- **Keywords:** hand biomechanics, motion analysis, marker attachment method, angle

Victoria Krauesslar, Rachel E. Avery & Jonathan Passmore. *Taking ownership of safety. What are the active ingredients of safety coaching and how do they impact safety outcomes in critical offshore working environments?* Pages 39-46.

Safety coaching interventions have become a common feature in the safety critical offshore working environments of the North Sea. Whilst the beneficial impact of coaching as an organizational tool has been evidenced, there remains a question specifically over the use of safety coaching and its impact on behavioural change and producing safe working practices. A series of 24 semi-structured interviews were conducted with three groups of experts in the offshore industry: safety coaches, offshore managers and HSE directors. Using a thematic analysis approach, several significant themes were identified across the three expert groups including connecting with and creating safety ownership in the individual, personal significance and humanisation, ingraining safety and assessing and measuring a safety coach's competence. Results suggest clear utility of safety coaching when applied by safety coaches with appropriate coach training and understanding of safety issues in an offshore environment. The current work has found that the use of safety coaching in the safety critical offshore oil and gas industry is a powerful tool in managing and promoting a culture of safety and care.

- **Keywords:** safety-coaching, environmental, high-risk, oil-and-gas-industries, safety-critical

Marzena Malińska, Krystyna Zużewicz, Joanna Bugajska & Andrzej Grabowski. *Heart rate variability (HRV) during virtual reality immersion*. Pages 47-54.

The goal of the study was assessment of the hour-long training involving handling virtual environment (sVR) and watching a stereoscopic 3D movie on the mechanisms of autonomic heart rate (HR) regulation among the subjects who were not predisposed to motion sickness. In order to exclude predispositions to motion sickness, all the participants (n=19) underwent a Coriolis test. During an exposure to 3D and sVR the ECG signal was continuously recorded using the Holter method. For the twelve consecutive 5-min epochs of ECG signal, the analysis of heart rate variability (HRV) in time and frequency domains was conducted. After 30 min from the beginning of the training in handling the virtual workstation a significant increase in LF spectral power was noted. The values of the sympathovagal LF/HF index while sVR indicated a significant increase in sympathetic predominance in four time intervals, namely between the 5th and the 10th minute, between the 15th and the 20th minute, between the 35th and 40th minute and between the 55th and the 60th minute of exposure.

- **Keywords:** heart rate variability, motion sickness, stereoscopic movie, virtual reality

Tzu-Hsien Lee. *The effects of load magnitude and lifting speed on the kinematic data of load and human posture*. Pages 55-61.

This study examined the effects of load magnitude and lifting speed on the kinematic data of load and human posture in a lifting task. Three load magnitudes (10, 20 and 30 kg) and three lifting speeds (fast, normal and slow) were examined in this study. This

study showed that participants shortened the load acceleration period on lifting a lighter load than on lifting a heavier load. For normal and slow lifting speeds, participants moved and lifted the load closer to their body when lifting a heavy load. Participants tended to maintain their postures by using an ankle strategy when in heavier load or faster lifting conditions. The profiles of angle velocity of knee and ankle joints demonstrated the important role of the lower extremities in the acceleration of the load in the initial stage of fast lifting. In addition, participants could not easily control the momentum transmitted to the ankle joint for lifting the heavy load.

- **Keywords:** manual lifting, strategy, low back injury

Märt Masso. *The determinants of employee participation in occupational health and safety management*. Pages 62-70.

This article focuses on employee direct participation in occupational health and safety (OHS) management. The article explains what determines employee opportunities to participate in OHS management. The explanatory framework focuses on safety culture and safety management at workplaces. The framework is empirically tested using Estonian cross-sectional, multilevel data of organizations and their employees. The analysis indicates that differences in employee participation in OHS management in the Estonian case could be explained by differences in OHS management practices rather than differences in safety culture. This indicates that throughout the institutional change and shift to the European model of employment relations system, change in management practices has preceded changes in safety culture which according to theoretical argument is supposed to follow culture change.

- **Keywords:** occupational health and safety, safety management, safety culture, employee participation

Anders E. af Wåhlberg. *Environmental determinants of celeration behaviour*. Pages 71-79.

Celeration (speed change) behaviour of drivers has been posited to be the best predictor of their traffic accident involvement. The origins of this behaviour, however, have not been specified. A model is therefore introduced, where celeration is partly due to the individual disposition of the driver (i.e., driving style), and partly to the environment (road layout, rules and traffic density). Three measurement problems for celeration were studied; the effect of traffic density, of regular versus irregular routes, and weight of the vehicle (loaded/unloaded) on celeration behaviour. Two small samples of truck drivers in Sweden were measured for several months each. There was a strong effect of vehicle load, with behaviour being more cautious with increased weight. Driving on different roads also yielded differences in behaviour, although the design used did not permit conclusions about what caused these. Traffic volume was not found to have any reliable effect on celeration.

- **Keywords:** acceleration, truck, safety, driving environment

Aliye Mandiracioglu, Osman Bolukbas, Mehmet Demirel & Filiz Gumeli. *Factors related to presenteeism among employees of the private sector*. Pages 80-85.

The objective was to explore the relationship between person-based variables and work-related variables of presenteeism in four different private sector workplaces. Employees (N=413) filled in a questionnaire related to demographic and socio-economic characteristics, social networks, work-related factors, lifestyle factors and state of health. Presenteeism was assessed using the Stanford Presenteeism Scale 6 (SPS-6). The majority of respondents were male (77.2%), and mean age was 34.7±8.1 years. The

prevalence of chronic conditions was 15.9%. The mean score for the SPS-6 was 19.9 (*SD*, 3.3). The female score was higher than the male score on the SPS-6 in this study. Total score was higher among workers who reported working at high speed. SPS-6 score was higher among individuals with a chronic health problem. Understanding of the workplace and personal factors related to presenteeism may support the health and well-being of workers.

- **Keywords:** presenteeism, workers, Stanford Presenteeism Scale 6, occupational health

Liang Ma, Wei Zhang, Su Wu & Zhanwu Zhang. *A new simple local muscle recovery model and its theoretical and experimental validation*. Pages 86-93.

This study was conducted to provide theoretical and experimental validation of a local muscle recovery model. Muscle recovery has been modeled in different empirical and theoretical approaches to determine work-rest allowance for musculoskeletal disorder (MSD) prevention. However, time-related parameters and individual attributes have not been sufficiently considered in conventional approaches. A new muscle recovery model was proposed by integrating time-related task parameters and individual attributes. Theoretically, this muscle recovery model was compared to other theoretical models mathematically. Experimentally, a total of 20 subjects participated in the experimental validation. Hand grip force recovery and shoulder joint strength recovery were measured after a fatiguing operation. The recovery profile was fitted by using the recovery model, and individual recovery rates were calculated as well after fitting. Good fitting values ($r^2 > .8$) were found for all the subjects. Significant differences in recovery rates were found among different muscle groups ($p < .05$). The theoretical muscle recovery model was primarily validated by characterization of the recovery process after fatiguing operation. The determined recovery rate may be useful to represent individual recovery attribute.

- **Keywords:** muscle recovery, muscle recovery model, validation, electromyography

Farheen Bano, Zulqernian Mallick & Abid Ali Khan. *Optimization of the levels of grip force, stroke rotation, frequency and grip span for a torqueing task*. Pages 94-104.

This study was to investigate the effects of grip force, frequency, stroke rotation and grip-span on discomfort and obtain best posture for hand tool users. Fifteen male participants volunteered in this study. Participants performed combined gripping with torqueing exertions for 5 min for two levels of frequency (10 and 20 exertions/min) at two levels of grip force (50 and 70 N), two levels of stroke rotation (30° and 60°) and three levels of grip-span (4.7, 6 and 7.3 cm). Therefore, a 2×2×2×3 full factorial design was used. The analysis of variance (ANOVA) showed that frequency, stroke rotation and grip-span were significant on discomfort score. Minimum discomfort and comfortable posture was found to be 90 N grip force with 10 exertions/min for 60° stroke rotation at 6-cm grip-span. The grip force, frequency and stroke rotation were found significant on EMG activity of forearm muscles using multivariate analysis of variance (MANOVA). The extensor muscles were found more activated than flexor muscles during the given task.

- **Keywords:** grip force, stroke rotation, grip span

Walaa S. Mohammad, Hayat H. Hamza & Walaa M. ElSais. *Assessment of neck pain and cervical mobility among female computer workers at Hail University*. Pages 105-110.

The aims of this study were to investigate the prevalence of neck pain among computer workers at Hail University, Saudi Arabia and to compare the cervical range of motion (ROM) of female computer workers suffering from neck pain to the cervical ROM of healthy female computer workers. One hundred and seventy-six female volunteers between 20 and 46 years of age were investigated. Fifty-six of these volunteers were staff members, 22 were administrators and 98 were students. The Cervical Range of Motion (CROM) instrument was used to measure the ROM of the cervical spine. A questionnaire was used to assess participants for the presence of neck pain. The data were analyzed using the Statistical Package for Social Sciences (SPSS) software, and the level of significant was set at $p < .05$ for all statistical tests. There was a high prevalence of neck pain (75%) among computer workers at Hail University, particularly among students. There were significant differences in cervical lateral flexion, rotation to the right side and protraction range between the pain and pain-free groups. Our results demonstrated that cervical ROM measurements, particularly cervical lateral flexion, rotation and protraction, could be useful for predicting changes in head and neck posture after long-term computer work.

- **Keywords:** Hail University, neck pain, computer workers, females, CROM

Jin-Seung Choi, Han-Soo Kim, Yoon-Ho Shin, Mi-Hyun Choi, Soon-Cheol Chung, Byung-Chan Min & Gye-Rae Tack. *Differences in driving performance due to headway distances and gender : the application of jerk cost function*. Pages 111-117.

Driving is directly controlled by the driver's movement. This study tried to compare differences in gender and headway distances between the DRIVING phase and the SUDDEN STOP phase by using subjects' movement during driving in the simulator. To quantify subjects' movement, the jerk cost function (JC) was used, and conventional vehicle control parameters such as the coefficient of variation of the mediolateral trajectory (MLCV) for lane keeping and the brake time (BT) were also used. As the headway distance increased, MLCV and JC decreased significantly in the DRIVING phase. In the SUDDEN STOP phase, BT was increased and, MLCV and JC were decreased. Differences between genders were detected for both MLCV (males < females) and JC (males > females). The results of this study demonstrate that JC may be used as a variable in evaluating driving performance as influenced by driving conditions and gender.

- **Keywords:** driving simulator, motion analysis, gender, sudden stop, headway distance