

Nickel, P.; Schomann, C.; Meyer, I., and Nachreiner, F. (2002). The Suitability of the 0.1 Hz Component of Heart Rate Variability for Usability Testing. In H. Luczak; A. Çakir & G. Çakir (Eds.), WWDU 2002 - Work With Display Units World Wide Work (Proceedings of the 6th International Scientific Conference on Work With Display Units, May 22-25, 2002, Berchtesgaden, Germany) (pp. 467-469). Berlin: Ergonomic Institut.

— ABSTRACT —

**The Suitability of the 0.1 Hz component of Heart Rate Variability for Usability Testing**

**Peter Nickel, Carsten Schomann, Inga Meyer, Friedhelm Nachreiner**

University of Oldenburg, Industrial and Organizational Psychology Unit, D-26111 Oldenburg, Germany  
E-mail: peter.nickel@uni-oldenburg.de

The operator's workload is a relevant criteria in evaluating the quality of a system design and the usability of software, which refers to the extent to which software can be used to perform tasks effectively, efficiently and satisfactory for the user. The 0.1 Hz component of heart rate variability (HRV) is currently described as a suitable measure of mental strain, however, recent laboratory research showed unacceptably low sensitivity and diagnosticity. In a usability laboratory during typical haulage operations and during process simulation in a VDU-based control room physiological and performance measures were taken together with video observations. The results support the interpretation that this HRV measure indicates emotional strain or arousal processes rather than mental or cognitive strain. It is concluded that an evaluation of emotional strain is not sufficient for an usability assessment, particular not for practical purposes, where some occupational risks may be at stake.