Positive and Relaxing Effects of Virtual Reality Applications

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Digitization has a deep impact on the way of working (Parviainen, Tihinen, Kääriäinen, & Teppola, 2017). As a result cognitive strain increases which also affects productivity and performance as the latest health report of the BKK (German Health Insurance) demonstrates. Employees report negative emotional and cognitive effects leading to mental stress (Knieps & Pfaff, 2017). Accordingly, effective interventions and methods are needed to reduce negative effects, affect employees positively and as a result vitalize their work performances. Recovery experiences positively relate to on-job behavior (Sonnentag, 2003). Studies further show that short relaxation phases affect mood (Kaida, Takahashi, & Otsuka, 2007) and memory performance (Lahl, Wispel, Willigens, & Pietrowsky, 2008) positively. Thus, short relaxation phases are a promising intervention approach. In line with this, large companies offer employees relaxation spaces such as sleeping capsules. However, portable, cost efficient and simultaneously effective infrastructures have not been implemented and evaluated yet. Virtual Reality (VR) applications meet these requirements providing an immersive environment and encapsulate users from the real world. Several studies support relaxation potential of VR (Kosunen et al., 2016; Riva et al., 2007; Soyka et al., 2016). This work investigates the effect of four

relaxation conditions on mood and perceived stress. Based on prior research we assume that an immersive VR application enhances (a) positive affect, (b) lowers negative affect and (c) lowers perceived strain compared to an audio only application.

To investigate these assumptions, we conducted a 2 (VR vs. No VR) x 2 (sleeping capsule vs. deck chair) experimental within-between-subjects design. Relaxation was supported by music via headphones. Participants were assigned randomly and attended the same respective condition twice within a fixed delay of one week to further examine possible long-term effects of the methods. After a brief information participants filled out a first set of questions, followed by a relaxation period of 15 minutes. During relaxation we obtained biofeedback via a heart rate wristband to include an objective perspective on participants' relaxation state. Afterwards, the second part of the questionnaire was assessed. We captured mood with the German version of the Positive and Negative Affect Schedule (PANAS) by Krohne and colleagues (1996). We obtained strain by using the state subscale of the German version of the State Trait Anxiety Inventory (Laux, Glanzmann, Schaffner, & Spielberger, 1981). Besides demographic data we also assessed simulator sickness to control for biases and qualitative feedback. Data consists of 61 data sets virtually equally distributed to all four conditions.