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Relation between Direct Observation of Relaxation and Self-Reported Mindfulness and Relaxation States

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Abstract

Forty-four individuals, 18-47 (MN 21.8, SD 5.63) years of age, took part in a study examining the magnitude and direction of the relationship between self-report and direct observation measures of relaxation and mindfulness. The Behavioral Relaxation Scale (BRS), a valid direct observation measure of relaxation, was used to assess relaxed behavior snd served as the criterion variable. Two self-report measures, the Relaxation Inventory (RI) and the Smith Relaxation State Inventory-Revised (SRSI-R), a measure assessing 15 relaxation-States (R-States) including the R-State Aware, a proxy for mindfulness. Participants were assessed on two occasions, one week apart. Self-report measures were administered in random order immediately after direct observation of relaxed behavior. Correlation analysis was conducted to examine the relationships between measures. Interobserver agreement of relaxed behavior was obtained on 41% of the observations. Data from Time 1 and 2 were combined and a mean score was derived and used in the analysis of relationships. There was no significant relation between the R-State Aware and BRS ($r = .10$, $p = .25$). No further analysis of relations between self-report measures was possible due lack to failure to replicate the construct validity of the RI. Results indicate the R-State Aware is not a proxy measure of mindfulness as suggested by Smith (2005). Further research examining the relation between relaxation training and mindfulness is needed.

Keywords

mindfulness, relaxation training, Behavioral Relaxation Scale

Relaxation has been difficult to define (Poppen, 1998). One current definition, reminiscent of Wolpe's (1969) description relaxation, is the reduction of neurophysiologic arousal (Smith, 2007), resulting in decreased stimulation of the autonomic nervous system. Individuals are not naturally in a relaxed state, and in order to achieve this state, change in overt behavior must first occur. Poppen (1998) proposed that relaxation is a complex behavior comprised of four inter-related response classes: motoric, verbal, visceral, and observational behavior. The extent of overt relaxation is determined by the decrease in bodily posture, for example, the position of the head, reduced rate of speech (Poppen, 1998). Cognitive activity also changes in terms of frequency and content with reports of calmness common (Crist, Rickard, Prentice-Dunn, & Barker, 1989). Smith (2005) described the self-reported effects of relaxation as producing various relaxation states (R-State), which are "psychological states of mind associated with practicing relaxation and mastering the act of sustaining passive simple focus" (1999, p. 5) He also asserted that relaxation produced a "core state of mindfulness."

Mindfulness interventions are aimed at producing non-judgmental awareness and acceptance of emotion, bodily sensation, and cognition. To acquire these behaviors concentrative meditation is frequently first used in which the participant is instructed to attend to ("concentrate on") one stimulus such as breathing. If a distracting event occurs, either external or internal, the trainee attends the single target stimulus previously identified. This aspect of mindfulness, meditation and relaxation suggest both a conceptual and training overlap. Bensen, Beary, and Carol, 1974 (1974), asserts that it is the attention to the target stimulus that is the primarily responsible for the production of the relaxation response. Moreover, Baer (2003) and Roemer (2003) have proposed relaxation as one mechanism of change responsible for mindfulness. Instructions to relax (sit passively in a reclining chair and attend to internal events) is used to teach mindfulness (Roemer & Orsillo, 2009), but this procedure is very different than relaxation training per se, such as progressive relaxation (Jacobson,1938) or Behavioral Relaxation Training (BRT; Poppen, 1998). No research has examined the relation between relaxation training and mindfulness. The purpose of this study was to determine the magnitude and direction of the relationship between self-reported mindfulness and relaxation states and direct observation measures of relaxation.

Method

Participants

Forty-four individuals, age 18-47 (MN age 21.8 years, SD 5.63), recruited from undergraduate psychology classes in at medium sized, Midwestern university, took part. None of the participants were pregnant, had a history of relaxation training, were prescribed medication for stress or anxiety, or had previously received any relaxation, meditation or biofeedback training. The research was approved by the university Institutional Review Board and conducted according to APA ethical guidelines.

Variables

Behavioral Relaxation Scale (BRS). The BRS is a valid and reliable measure of overt, relaxed behavior (Poppen & Maurer, 1998; Lundervold &Dunlap, 2006; Norton, Holm, & McSherry, 1997).). Ten behaviors assessed using the BRS are body, head, mouth, throat, shoulders, hands, feet, quiet, eyes, and breathing (Poppen, 1998). Direct observation and recording of behavior is done using a 60-second interval observation system. A percent relaxed score is obtained, with higher scores indicating greater relaxation.

Relaxation Inventory (RI). The Relaxation Inventory (RI) is a 45-item self-report questionnaire used to measure three dimensions of relaxation: Physiological Tension (PT), Physical Assessment (PA), and Cognitive Tension (CT) (Crist et al., 1989). Participants rate the extent to which they agree with each item on a 5-point likert scale. The three dimensions of the RI were designed to be orthogonal; thus, three individual scales scores are obtained (Crist et al., 1989).

Smith Relaxation States Inventory- Revised (SRSI-R). This self-report measure assesses the degree to which an individual reports change in sensation, cognition, and emotion following relaxation. Fifteen individual R-State scores are obtained. Higher scores indicate more a greater R-State. The SRSI-R has under gone numerous factor analytic studies to derive each of the R-States; however, no further psychometric evaluation has been reported.

Design and analysis

Descriptive statistics were used with demographic variables. Examination of linear relationships among variables was first conducted. Due to nonlinearity, a Spearman rho correlation was used. Data from Time 1 and 2 were combined and a mean score derived and used in the analysis of relationships.

Procedure

Participants were seated in a reclining chair and instructed to move the chair into the fully reclined position. They were then instructed to relax. Following a 5 minute adaptation period, a 5 minute observation of relaxed behavior was conducted using the BRS. Immediately upon completion of the observation the counterbalanced self-report measures was administered. Participants were instructed to return one week later. Time 2 assessment was conducted in the same manner as Time, except no adaptation period was provided.

Inter observer agreement of relaxed behavior was obtained using two observers who simultaneously and independently observed and recorded relaxed behavior. Observers were trained to observe and record the 10 relaxed behaviors using behavioral skill training procedures. All observers were trained to a mastery criterion of 80% agreement for three consecutive trials, followed by a check out assessment with the laboratory director (DAL).

Results

Interobserver agreement of relaxed behavior was obtained on 41% of the observations (MN 89.4% , range 78-98%). Test-retest reliability was obtained

for the BRS (r = .35, p = .02), the RI (r = .72-.82, p = .000), and 14 of the 15 R-States (r = .32-.76, p = .000-.03). Construct validity of the RI was not established using direct observation of relaxed behavior as the criterion measure. Previously reported construct validity of the RI was not replicated; the constructs, PT, PA, and CT, were not found to be orthogonal and were significantly correlated with one another (PT vs. PA: r = .51, p = .000; PA vs. CT: r = .49, p = .001; CT vs. PT: r = .39, p = .006).

No relationship between the R-State *Aware*, proxy measure of mindfulness, and direct observation of relaxed behavior (BRS) was obtained (r = .10, p = .25). Construct validity of the SRSI-R was not established when direct observation of relaxed behavior (BRS) was the criterion variable (r = -.02-.21, p = .09-.47).

Discussion

Support for the *Aware* subscale of the SRSI-I as a measure of mindfulness was not obtained. The BRS has previously been shown to be a valid measure of overt, relaxed behavior (Poppen & Maurer, 1982; Norton et al., 1997). The BRS has also been shown to be a valid measure in clinical studies of relaxation and electromyographic biofeedback training (Chung, Poppen & Lundervold 1995; Lundervold, Belwood, Craney, & Poppen, 1999; Lundervold & Poppen, 2004). While the SRSI-R was shown to be stable over a one-week period, the measure was not related to directly observed relaxed behavior (BRS). Due to a failure to replicate the construct validity of the RI, further examination of relationships between the RI and SRSI-R were not conducted

SRSI-R scores were high at each measurement period and a floor effect was present for many scales with high scores obtained after a period of rest. A fundamental problem with the SRSI-R is the limited range of scores (1-4). If relaxation training produces mindfulness, a more psychometrically sound scale with a wider range of response options may be sensitive enough to capture these subtle changes in self-reported events. Further research is needed in this area. In a similar fashion, measures of mindfulness also need to be related to demonstrated change in measures of overt behavior.

RI scales were also unrelated to the BRS and construct validity of the RI was not replicated. Sample characteristics of Crist et al. and the present study are virtually identical; therefore, it is unlikely that this variable influenced the findings. The larger sample size of the current study would have been more likely to obtained findings similar to those reported by Crist et al. (1989). Methodological variance in measurement (i.e. time between observations) may have contributed to the lack of a significant relation between the RI and the BRS. Crist et al. assessed participants before and after a one-hour period for three consecutive days. The present study, however, assessed participants after a one-week interval. The longer interval between assessments is a more representative interval used in research and clinical settings. Further research is necessary to determine if, after a brief one-hour interval, RI and BRS scores are related. Crist also based construct validity on self-report measures rather than the more rigorous measure of overt relaxed behavior or physiological indices.

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