

**Assessing psychological flexibility: Validation of the Open and Engaged State
Questionnaire**

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Abstract

Background: Despite increasing research on psychological flexibility (PF) and its importance to psychological health, only a few measures exist for assessing this construct, and they have shortcomings, particularly in construct validity.

Methods: This study assessed the factor structure, construct validity, and predictive value of the Open and Engaged State Questionnaire (OESQ) on samples with panic disorder and/or agoraphobia ($n = 120$), panic disorder with agoraphobia ($n = 46$), and burnout ($n = 85$).

Results: The confirmatory factor analysis verified the expected one-dimensional structure and found good internal consistency in all three samples. Analysis of the construct validity revealed correlations to pathology, personality traits, and total functioning; it also revealed discrimination of PF from neuroticism when measured with the OESQ. Furthermore, we found that PF predicted outcomes of symptomatology.

Conclusions: Considering the criticisms and suggestions for improvement in the literature on assessing PF, the OESQ proved to be a valuable operationalization of this construct. With better discriminant and incremental validity compared to other questionnaires as well as unique predictive value, the OESQ is important for future research on PF and acceptance and commitment therapy (ACT).

Keywords: psychological flexibility, assessment, construct validity, incremental validity, predictive validity, OESQ.

Assessing psychological flexibility: Validation of the Open and Engaged State Questionnaire

The construct of psychological flexibility (PF) has been postulated to be a central aspect of psychological health (Kashdan & Rottenberg, 2010) and has been receiving increased attention in clinical and health psychology. Defined as “the ability to contact the present moment more fully as a conscious human being, and to change or persist in behavior when doing so” (Hayes, Luoma, Bond, Masuda, & Lillis, 2006, p. 7), PF is a broad, higher-level construct that consists of overlapping and intercorrelated processes derived from acceptance and commitment therapy (ACT), such as experiential avoidance, acceptance, cognitive defusion, present-moment awareness, and value-based committed action (Hayes et al., 2006; Hayes, Strosahl, & Wilson, 1999). According to Kashdan and Rottenberg (2010), PF describes a specific aspect of mental health that related and well-examined constructs such as psychological well-being and symptom-related scales do not cover. Research has shown that PF may be a mediator for changes in psychopathology and may be related to symptom reduction (e.g. Forman, Herbert, Moitra, Yeomans, & Geller, 2007; McCracken, Vowles, & Eccleston, 2004). It is also strongly related to clinically relevant variables such as impairment, functioning, quality of life, and lower levels of distress (for an overview, see Gloster, Klotsche, et al., 2011; Hayes, Levin, Plumb-Villardaga, Villatte, & Pistorella, 2013). It has furthermore been shown that PF is positively related to personality measures such as extraversion, openness, and conscientiousness and negatively to the personality dimension of neuroticism (e.g., Gloster, Klotsche, et al., 2011).

Despite the large research on PF and promising findings, the literature views the operationalization of PF critically. Since PF relates to concrete behaviors in specific situations, ideal studies should directly observe and record continually changing behaviors and contexts. While there are also more economical and simple attempts to capture and operationalize PF using questionnaires, measuring PF using questionnaires is complicated by

its complex, multifaceted nature with different (cognitive, affective, behavioral) components (Chawla & Ostafin, 2007). All of these factors likely contribute to limiting the pool of instruments designed to measure PF.

To date, the vast majority of studies have measured PF using the Acceptance and Action Questionnaire (AAQ; Bond & Bunce, 2003; Hayes et al., 2004) and a revised version of it (AAQ-II; Bond et al., 2011). Other general measures for PF, such as the Multidimensional Experiential Avoidance Questionnaire (MEAQ; Gámez, Chmielewski, Kotov, Ruggero, & Watson, 2011) and the recent Comprehensive Assessment of Acceptance and Commitment Therapy Processes (CompACT; Francis, Dawson, & Golijani-Moghaddam, 2016), do not target all ACT processes (MEAQ) or need further research and validation (CompACT). Despite the dominance of the AAQ-II as a measure for PF, the literature criticizes its psychometric properties.

The most criticized psychometric property of the AAQ and the AAQ-II is its construct validity. Zvolensky, Feldner, Leen-Feldner, and Yartz argue that the AAQ may not sufficiently differentiate PF from constructs such as psychological distress (2005), and Wolgast discusses how items of the AAQ-II are more strongly related to measuring distress than abilities of acceptance (2014). Likewise, Gámez et al. conclude that it remains unclear whether the items of the AAQ and the AAQ-II reflect more levels of experienced aversive emotions than levels of PF (2011). The AAQ has furthermore been criticized for correlating too strongly with the personality trait of neuroticism (Boelen & Reijntjes, 2008; Kashdan & Breen, 2007) and with negative emotionality (AAQ and AAQ-II, Gámez, et al., 2011). And Francis, Dawson, and Golijani-Moghaddam have argued that the AAQ-II has a preponderance of items focused on acceptance and defusion but neglects other ACT processes (Francis, Dawson, & Golijani-Moghaddam, 2016). The wording of items on the AAQ and AAQ-II also potentially complicates assessment. Some of its items are global (Kashdan & Rottenberg, 2010) and seem not to distinguish sufficiently between outcomes and the desired processes;

they focus too much on outcomes (e.g., measuring the intensity of emotions or memories) instead of capturing the actual concrete ability to deal with emotions in a specific situation (Chawla & Ostafin, 2007; Wolgast, 2014).

We also argue that assessments of PF would benefit from capturing concrete behavioral aspects that clearly differentiate it from personal beliefs, assumptions, characteristics, and traits (e.g. beliefs about emotions). Recent research on the so-called memory-experience gap emphasizes how reports of episodic affective states are inaccurate; in particular, retrospective evaluations often exaggerate emotional experiences (Miron-Shatz, Stone, & Kahneman, 2009). This suggests that the retrospective evaluation of an emotion when assessing PF may diverge from the actual experienced emotion (including its effect on behavior). Considering this gap, we suggest a more dynamic state-related measurement of PF that considers, for example, concrete behaviors in situations instead of overarching constructs such as beliefs about emotions and their effects (for example, one item on the AAQ-II reads: “I’m afraid of my feelings”).

To improve future research on PF and ACT, alternative assessment tools need to be explored. . Instead of focusing on outcomes, new assessments of PF should focus on processes that are directly linked to emotion-related behavioral patterns and not on beliefs about emotions (Chawla & Ostafin, 2007; Wolgast, 2014). Ideally, new assessments should use a contextually situated approach (Wolgast, 2014) and explicitly incorporate temporality and person–situation interactions (Kashdan & Rottenberg, 2010).

Based on these suggestions, we developed a short scale that assesses concrete state-level behavior and so should be sensitive to change. The Open and Engaged State Questionnaire (OESQ) measures PF by considering all six core processes of ACT with a focus on the overriding behavioral abilities of being *open* (left side of the ACT hexagon) and *engaged* (right side of the ACT hexagon). By using wording that provides respondents with examples and situation clarifications, its items attempt to attend as much as possible to

concrete behaviors. Finally, as suggested in the literature, every item offers temporal specifications.

The study presented in this paper had two aims. The first aim was to test the psychometrics of the OESQ. In a second step, we examined different hypotheses regarding construct and incremental validity. First, with regard to convergent validity, we hypothesized that PF assessed with the OESQ would positively correlate to a high degree with other measures of PF and to a moderate degree with measures of subprocesses of PF (e.g., mindfulness, cognitive fusion, and emotion regulation). Second, PF assessed with the OESQ would positively correlate with measures of functioning and with the personality dimensions of extraversion, openness, and conscientiousness; and it would correlate negatively with measures of psychopathology. Furthermore, it would negatively correlate to a low degree with the personality dimension of neuroticism and negligibly correlate with sociodemographic variables (discriminant validity). Third, with regard to the incremental validity of PF above and beyond established measures, we hypothesized—in line with previous research on PF (assessed with AAQ-II, Gloster et al., 2011)—that PF assessed with the OESQ would predict functioning and well-being more than symptomatology since, as mentioned above, PF relates to concrete behaviors and not to diagnosis or symptoms.

Method

Sample

The data for this study derives from patients in three independent German samples.

The first sample consisted of 114 participants from a 24-month follow-up assessment (Gloster et al., 2013) of the multicenter mechanisms of action in a CBT (Cognitive Behavioral Therapy) trial for panic disorder and/or agoraphobia (PD/AG; Gloster et al., 2009; Gloster, Wittchen, et al., 2011). All participants met diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders. Comorbid diagnoses including unipolar depression and other anxiety disorders were allowed unless they were of primary clinical concern. The

mean age of the participants was 36.8 years ($SD = 11.1$, age range = 19–63 years), and 24% of the participants were male. Data reported in the present study was assessed at the 24-month follow-up.

The second sample comprised of 44 nonresponding patients with diagnoses of reliable panic disorder and agoraphobia. All participants had received at least one previous course of psychological and/or pharmacological treatment and were receiving ACT treatment (PD/NR; Gloster et al., 2015). They had a mean age of 36.4 years ($SD = 8.8$, age range = 23–57 years), and 30% of the participants were male. Data reported in the present study was assessed posttreatment.

The third sample (BO) contained 85 burnout participants who took part in a randomized observational study with a wait-list control group (Hofer et al., 2017) on the effectiveness of a self-help book for burnout based on the principles of ACT (*ACT gegen Burnout*; Waadt & Acker, 2012). Inclusion criteria consisted of a score of at least 17 on the Perceived Stress Scale (PSS, Cohen, Kamarck, & Mermelstein, 1983), which corresponds to at least moderate levels of perceived stress. The mean age was 42.8 years ($SD = 9.7$, age range = 23–60 years), and 26% of the participants were male. Data from the third sample reported in the present study was assessed at baseline and posttreatment.

As already mentioned, we used posttreatment data for all three samples. For the first sample (PD/AG), we only had 24 months of follow-up data on the OESQ. For the second sample (PD/NR), we also only had posttreatment data on the OESQ. For these two samples, the OESQ was only belatedly included into the existing study design. To maintain consistency, we decided to focus on the postassessment data for all three samples when interpreting the results. Nevertheless, for the sake of completeness, Table 2 reports all the available baseline data in relation to the OESQ for the third sample (BO).

Measures

In all the samples, numerous measures were assessed for different purposes. The following measures were used in this study. Table 2 offers an overview of which measures were assessed in which sample.

This study provides a validation of the OESQ, a new alternative measure for PF. We generated an initial pool of items by consulting ACT theory, existing scales, and experienced ACT experts such as researchers, therapists, consultants and/or trainers. In developing the items, we placed great value on addressing the literature's recommendations. We formulated all the items in such a way so that they refer to concrete behavior in specific situations, are temporally specific, and related to one of the six core processes of ACT. Through discussion and feedback in small groups, we came to a consensus on the initial six items. We selected this pool of items so that one item existed for each of the six core ACT skills. Using results from factor analysis, we subsequently removed two items. The removed items were the following: "To what extent have you behaved in a manner consistent with your values over the last 7 days?" and "How willing were you during the last 7 days to feel anxiety without trying to influence it (for example trying to control, eliminate, or suppress it)?" In its final version, the OESQ contains four items. All of them refer to experiences from the previous seven days and can be rated from 0 (not at all) to 10 (very much). Item 3 is reversed, and all items can be summed up to generate a total score. High scores refer to high levels of psychological inflexibility.

The **Acceptance and Action Questionnaire II (AAQ-II)** (Bond et al., 2011) measures psychological inflexibility and experiential avoidance (EA). It contains seven items that can be rated from 1 (never true) to 7 (always true) and has a total score ranging from 7 to 49, with a higher score indicating lower psychological flexibility. The German version has evidenced very good internal consistency in the nonclinical samples and good internal consistency (in the clinical samples Cronbach's α ranging from .84 to .92).

The **Agoraphobic Cognitions Questionnaire (ACQ)** (Chambless, Caputo, Bright, & Gallagher, 1984) is a self-report instrument for assessing “fear of fear” or cognitions about catastrophic consequences of experiencing anxiety. The 14 items of the questionnaire are answered on a 5-point scale ranging from never to always. In various samples, the ACQ has shown good results in internal consistency (Cronbach’s $\alpha = .75$).

The **Anxiety Sensitivity Index (ASI)** (Peterson & Reiss, 1993) assesses anticipatory fear and sensitivity to anxiety symptoms. It is composed of 16 items that have to be rated from 0 (very little) to 5 (very much). The German version has had good internal consistency in nonclinical and clinical groups (Cronbach’s α ranging from .79 to .92) (Ehlers & Magraf, 1993; Fehm, 2003).

The **Beck Depression Inventory (2nd ed.; BDI-II)** (Beck, Steer, & Brown, 1996) screens depression symptoms according to DSM-IV criteria. It contains 21 items. In 19 of the items, participants rate symptom severity from 0 to 3 within the last 2 weeks, and two items ask for changes in sleeping and eating behavior. The German version has shown strong internal consistency (Cronbach’s α ranging from .80 to .90) (Hautzinger, Keller, & Kühner, 2006).

The **Big-Five 16-Adjective Measure (BF 16-AM)** (Herzberg & Braehler, 2006) assesses five personality traits (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) using 16 adjectives, which have to be rated from 1 (disagree strongly) to 7 (agree strongly). A validation of the BF 16-AM has shown reasonable internal consistencies for the scale scores (Cronbach’s α ranging from .57 to .74) in a nonclinical sample (Herzberg & Braehler, 2006).

The **Cognitive Fusion Questionnaire (CFQ)** (Gillanders et al., 2014) is a brief self-report measure of cognitive fusion, one of the six core processes of PF. The CFQ has demonstrated good internal consistency (Cronbach’s $\alpha = .88$) across several samples (Gillanders et al., 2014).

The **Clinical Global Impression (CGI)** (Guy, 1976) is an observer-rated 3-item scale measuring illness severity, global improvement, and therapeutic response. The CGI is rated on a 7-point scale. The CGI has correlated positively with self-reported and clinician-administered measures across different psychological domains (Zaider, Heimberg, Fresco, Schneier, & Liebowitz, 2003). We used the German version of the CGI.

The **Difficulties in Emotion Regulation Scale (DERS)** (Gratz & Roemer, 2004) uses a self-assessment questionnaire to measure the degree to which difficult emotions are impacting the patient's daily life with six specific subscales: nonacceptance of emotional responses, difficulty engaging in goal-oriented behaviors, difficulty controlling impulses, lack of emotional awareness, lack of access to emotion-regulation strategies, and lack of emotional clarity. We consider these subscales to relate closely to core processes of PF such as nonacceptance to experiential avoidance and acceptance, difficulty engaging in goal-oriented behavior to value-based committed action, difficulty controlling impulses to present-moment awareness and experiential avoidance, lack of emotional awareness to present-moment awareness, lack of access to emotion-regulation strategies to value-based committed action, and lack of emotional clarity to present-moment awareness. The 36 items are rated from 1 (almost never) to 5 (almost always). The DERS is a reliable measure with very good internal consistency (Cronbach's $\alpha = .93$) (Gratz & Roemer, 2004).

The **Hamilton Anxiety Scale-Structured Interview Guide (SIGH-A)** (Hamilton, 1959; Shear et al., 2001) is a clinical interview about the severity of physical and psychological symptoms. The 14 items are rated on a 5-point scale. The SIGH-A has shown high interrater reliability and internal consistencies for rating scores in patients with and without anxiety diagnoses (Cronbach's α ranging from .79 to .88) (Shear et al., 2001).

The **Kentucky Inventory of Mindfulness Skills (KIMS)** (Baer, Smith, & Allen, 2004) is a self-report inventory for assessing four mindfulness skills: observing and attending to internal and external stimuli (observing), nonjudgmentally describing and labeling

phenomena (describing), acting with awareness and undivided attention to one thing at a time (acting with awareness), and accepting and allowing present moments or events to occur without judging them (accepting without judging). All 39 items are rated on a 5-point Likert scale ranging from 1 (never or very rarely true) to 5 (almost always or always true). The instrument has good internal consistency (Cronbach's α ranging from .75 to .91) (Baer, Smith, & Allen, 2004).

The **Maslach Burnout Inventory–General Survey (MBI-GS)** (Schaufeli, Leiter, Maslach, & Jackson, 1996) measures burnout with three subscales (emotional exhaustion, depersonalization, and personal accomplishment) and consists of 22 items that can be answered with yes or no. The internal consistency is good in various occupational subsamples and nations (Cronbach's α ranging from .66 to .86) (Schutte, Toppinen, Kalimo, & Schaufeli, 2000).

The **Mental Health Continuum (MHC-SF)** ((Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011) is a self-report questionnaire for positive mental-health assessment with subscales of emotional, psychological, and social well-being. It consists of 14 items, and the response options measure how frequently respondents experienced each symptom of positive mental health in six categories from never to every day. The short form of the MHC has shown very good internal consistency (Cronbach's $\alpha = .89$) in various age groups and nations (Lamers et al., 2011).

The **Panic and Agoraphobia Scale (PAS)** (Bandelow, Hajak, Holzrichter, Kunert, & Ruther, 1995) is a self-report questionnaire with a total score that indicates the severity of a panic disorder with or without agoraphobia. The PAS consists of 13 items based on a 5-point Likert scale (0 to 4) and has five subscales covering the spectrum of agoraphobia symptom clusters: panic attacks, agoraphobic avoidance, anticipatory anxiety, disability, and worries about health. It can be used by clinicians as well as for research purposes and has been successfully applied in both double-blind placebo-controlled studies and open treatment trials.

PAS scores in a sample of patients with panic disorder showed satisfactory levels of reliability and validity (Bandelow, 1995).

The **Perceived Stress Score (PSS)** (Cohen, Kamarck, & Mermelstein, 1983) measures the perception of stress associated with sex, age, education, income, employment status, and several other demographics. Subjects indicate how often they have found their lives unpredictable, uncontrollable, and overloaded in the last month. It was designed for community samples and contains 10 or 14 items, which can be rated from 0 (never) to 4 (very often).

The **Fragebogen zur sozialen Unterstützung (FSozU)** (Frydrich, Geyer, Hessel, Sommer, & Brähler, 1999) measures a patient's perceived social support. Its subscales are emotional support, practical support, social integration, burden from one's social network, reciprocity, availability of a trusted person, and satisfaction with social support. It has shown very good internal consistency (Cronbach's $\alpha = .93$), and numerous studies have confirmed its validity (Frydrich, Geyer, Hessel, Sommer, & Brähler, 1999).

Statistical procedure

The Confirmatory factor analysis (CFA) was conducted with AMOS version 22.0 to test the theoretically expected one-factor model. First statistical analyses, however, pointed to a two-factor model. Upon closer examination, this two-factor model did not result in an acceptable model fit for all the groups taken together. The two factors correlated significantly ($r = .99$) suggesting the theoretically coherent one-factor model. The following analyses included the test of the model fit of a one-factor model. As suggested by Byrne (2004), a baseline model for each group is not sufficient since measurement instruments often differ in each group. In this study, the PD/AG sample appeared substantially different from the other groups not only because it was the largest sample but also because it was assessed with the OESQ at a 24-month follow-up whereas the BO and PD/NR samples were given the OESQ after treatment. We therefore ran a multigroup analysis in AMOS, which showed that the

groups did not vary significantly ($\Delta X^2 = 3.85$, $\Delta df = 4$, $p = .616$). To maintain an overview of the different groups (PD/AG, PD/NR, BO), we did calculations for the groups both separately and together. The all-groups sample was respecified to improve the model's fit by adjusting the modification indices (m.i. > 10), which indicate misfits in the model (Kline, 2015). The models were compared using the chi-square difference test (Kline, 2015). The suggested modifications led to a more favorable model ($\Delta \chi^2 = 210.83$, $\Delta df = 5$, $p < 0.001$), but the modified items were neither theoretically coherent nor conceptually consistent. As a consequence, items 4 and 5 were removed and the one-factor model including four items was tested by a CFA. Items 4 and 5 contributed to all the suggested modifications and showed the lowest correlation (item 4: $r = .51$; item 5: $r = .27$) with the factor. Recommended criteria for assessing the model's fit (Hu & Bentler, 1998) were the root mean square error of approximation (RMSEA $\leq .06$), standardized root mean square residual (SRMR $\leq .08$), comparative fit index, and Tucker Lewis index (CFI, TLI $\geq .09$). Internal consistency was calculated with Cronbach's alpha. The analysis was conducted with reversed items 1, 2, and 4 (and 6 in the previous model) to obtain a better homogeneity of all items (Fromm, 2012). The test-retest reliability was examined with the Pearson correlation during the no-treatment period of the wait-list group of BO.

Hypothesis 1 tested the Pearson correlations between the OESQ, other measures of PF, and core processes of PF and predicted high correlation (convergent validity). Hypothesis 2 tested the Pearson correlation coefficients between the OESQ and established measures of symptomatology (e.g., depression, anxiety, and burnout), personality traits, and sociodemographic variables. It predicted strongly positive correlations to symptomatology and traits such as extraversion, openness, and conscientiousness (convergent validity) and low to negligible correlations to neuroticism and sociodemographic variables (discriminant validity). According to Cohen (1992), correlations below .1 are considered negligible, below .3 are low, below .5 are moderate, and over .5 are high. Differences between correlation

coefficients within a sample were tested by the Fisher z transformation (Meng, Rosenthal, & Rubin, 1992). Hypothesis 3 used hierarchical multiple-regression analysis to test the predictive value of the OESQ for symptomatology, avoidance, and functioning above and beyond established measures. Dependent variables for symptomatology were the SIGH-A (anxiety symptoms), the MBI (burnout inventory), and the CGI (panic symptoms). The dependent variable for avoidance was the CGI (agoraphobic avoidance), and dependent variables for functioning were the CGI (functioning), the MHC (well-being), and the FSozU (social functioning).

Results

Part 1: confirmatory factor analysis and reliability estimates

The one- and two-factor models were tested using the maximum-likelihood method (Kline, 2015). The analyses were run in each sample separately and in all samples together with the same restrictions and adjustments. The unrestricted one-factor model with six items did not fit the data well. Suggested changes to the modification indices (m.i. > 10; items 1 & 4 = 11.97, 1 & 5 = 19.36, 3 & 4 = 123.71, 3 & 5 = 24.29, 4 & 5 = 32.16) did not result in a theoretically coherent grouping. We therefore removed the two items with the lowest correlation (i.e., item 4: $r = .51$, item 5: $r = .27$). The CFA of the one-factor model including four items showed a good model fit for all groups together and separately (see Table 1). Furthermore, the chi-square difference test for comparing the model with six items to the model with four items (both using the all-group sample) was significant ($\Delta\chi^2 = 211.16$, $\Delta df = 7$, $p < 0.01$).

The internal consistency of the OESQ assessed with Cronbach's alpha was good across the three samples (PD/AG: $\alpha = .87$, PD/NR: $\alpha = .84$, BO: $\alpha = .83$) and in all the samples combined ($\alpha = .86$).

In sum, the results of the factor analyses confirmed the OESQ as a one-dimensional measure with four items and good internal consistency.

Part 2: analysis of the construct and incremental validity**Hypothesis 1: the OESQ correlates with other measures and core processes of PF.**

Table 2 provides all the correlation coefficients in relation to convergent validity. The OESQ correlated moderately to highly with the AAQ-II as a comparable measure for PF in all three samples. There was a high correlation with the CFQ as a measure for cognitive fusion (as one of the core processes of PF). There were moderate correlations with the DERS, the KIMS, and the MHC as measures for emotion regulation, mindfulness, and well-being (as other core processes of PF). All the results were consistent over all three samples. For the third sample (BO), additional baseline data was available. The correlations at baseline were consistent but lower compared to the coefficients at posttreatment.

Hypothesis 2: the OESQ correlates with measures of functioning and psychopathology as well as with personality dimensions. All correlation coefficients for hypothesis 2 are also provided in Table 2. The OESQ correlated highly with measures of symptomatology such as depression, stress, measures of burnout, severity of anxious symptomatology, severity of panic symptoms, and dysfunctional cognitions. The OESQ also correlated highly with measures of total functioning. It correlated moderately with measures of personality traits such as neuroticism, extraversion, and conscientiousness and did not correlate significantly with openness and agreeableness. We did not find a significant difference between the strength of correlations of the OESQ and the measures of functioning and psychopathology. The correlation with the sociodemographic variable of age was negligible and inconsistent with an overall tendency to low correlations to the sex. As for hypothesis one, all results are consistent over all three samples. For the third sample (BO), additional baseline data was available. Correlations at baseline are generally consistent but also lower compared to coefficients at posttreatment.

Hypothesis 3: PF predicts functioning and avoidance but not symptomatology.

Hierarchical multi-regression analyses were conducted to capture the predictive importance and value above and beyond established measures (PSS, BDI). The CGI, the MHC, and the FSozU were the dependent variables for functioning; the CGI was the dependent variable for avoidance, and the DGI, the MBI, and the SIGH-A were dependent variables for symptomatology. The OESQ added unique variance to functioning and agoraphobic avoidance. Against our hypothesis, it also did so for symptomatology (i.e., anxiety, burnout subscale of depersonalization, personal accomplishment, and panic symptoms). Furthermore, standardized regression weights β indicated that once the OESQ was added to the model, established measurements contributed significantly less to the explained variance of symptomatology (see Table 3). In sum, PF measured with the OESQ incrementally predicted outcomes of symptomatology (except emotional exhaustion in burnout and panic symptoms), avoidance, and functioning ($\Delta R^2 = .036-.142$).

Discussion

In this study, we examined the psychometrics of the OESQ, a short self-report questionnaire assessing PF. As expected, the study evidenced a one-factor structure and good internal consistency. We demonstrated construct validity based on correlations between the OESQ and measures of functioning, pathology, personality traits, well-being, existing measures for PF, and core processes of PF. These results are consistent with the theoretical assumption that PF is an overarching construct that plays an important role in numerous areas. At the same time, the OESQ did not correlate very strongly with these measures and thus can be assumed to measure an independent construct. Furthermore, the results of the present study confirm the assumption that OESQ predicts functioning and avoidance as expected and adds unique predictive value regarding symptomatology.

Although these results are promising, not all the analyses were consistent with our expectations. The results suggest that the OESQ may not assess all ACT skills equally. For

example, correlations with cognitive defusion were higher than with mindfulness or well-being. The stronger weighting of acceptance and defusion has also been criticized in existing measures for PF (Francis, Dawson, & Golijani-Moghaddam, 2016). Concerning the OESQ, this result should be further assessed in nonclinical samples to determine if this result has been biased by the fact this study only used clinical samples.

In addition, correlations of the OESQ with existing measures for PF were also not so high as to suggest that they both measure the same construct. This may indicate that the OESQ captures different facets of PF than other existing measures. Several factors likely contributed to this, including item wording, stipulated time frame (7-day vs. trait), and the specification of emotions. The combination of these factors may have led participants to consult specific behaviors across a shorter time frame than a general time-independent questionnaire.

Contrary to our expectations, the OESQ did not correlate with the personality trait of *openness*. Based on prior data (Gloster, Klotsche, et al., 2013) and comparable labeling of both variables, one may assume that both constructs are related. But upon a closer look, it appears that both variables do not refer to comparable processes. In personality, openness is related to being open to external experiences and to constructs such as intellectual curiosity or creativity. In ACT, being open relates to emotions and inner experiences and is related to concrete behavior in specific situations (state) and not to time-stable traits. Although this result is not in line with our assumptions, it seems to be theoretically congruent. Regarding discriminant validity for the other personality traits, the literature has discussed the insufficient differentiation of PF from neuroticism as a major lack of existing measures of PF. In the present study, we found the correlation to be lower compared to previous findings in other measures for PF (Gloster, Klotsche, et al., 2011), which suggests a better discriminant validity for the OESQ. Interestingly, the pattern of correlations between the OESQ and all Big Five personality traits is consistent with results on alternative measures for PF (Gloster,

Klotsche, et al., 2011). But when comparing the magnitudes of the correlations directly, the differentiation to personality traits seems to be stronger for the OESQ.

As expected, PF (when measured with the OESQ) predicted functioning and avoidance. But, against our assumptions, it did not incrementally predict well-being and social functioning but did predict symptomatology (e.g. anxiety, panic symptoms, and burnout). Past research has concluded that PF is most predictive on a functional level and only slightly predictive concerning symptomatology (Gloster, Klotsche, et al., 2011). Although this was unexpected, the predictive value of the OESQ can be seen as a promising result that underlines the importance of PF and its role in psychological health. Although the underlying theory of PF is not based on the assumption of a healthy normality, and it states that the categorizations of clinical diagnosis and symptomatology do not consider the many forms of psychological suffering (e.g., loneliness, meaninglessness, existential angst, low self-esteem), PF plays an important role in psychopathologies. Even if the aim of ACT is not to reduce symptomatology but to increase PF to obtain a higher quality of life in all psychological events (Hayes et al., 2012), developing alternative measures for PF that may generate predictive values can be important for clinicians and researchers.

From an empirical point of view, the study newly found additional predictive value in PF (symptomatology) and improved the discriminant validity with regard to personality traits. Both may be due to the mentioned differences between the OESQ and other questionnaires. These differences suggest that, with its focus on PF as a transdiagnostic overarching construct, the OESQ could be a measurement for any impairment (psychological event). PF assessed with the OESQ therefore contributes to the growing demand for developing transdiagnostic models and interventions in clinical psychology (Levin et al., 2014). The OESQ is as a new and valuable questionnaire for clinicians and researchers especially because of its shortness, time specificity, how it approaches PF as a state (by maximally focusing on

concrete behavior), and how it specifically includes items focusing on the right side of the ACT-hexagon.

Thus, we interpret these results as promising and a gain for contextual behavioral sciences. However, these results may also be interpreted from a different perspective. Our unexpected results (i.e., relation to psychopathology but not for example to social functioning or well-being) may suggest that the OESQ does not capture the full complexity of PF accurately enough, which is similar to other questionnaires for PF. Therefore, further investigations of alternate operationalization of PF are indispensable. The present study has limitations. For conducting the factor analyses, the sample sizes were relatively small (PD/AG = 114, PD/NR = 44, BO = 85). $N \geq 100$ is recommended, and the minimum requirement of $N \geq 5 \times t$ (t = number of estimated parameters) (Backhaus, Erichson, Plinke, & Weiber, 2015) was met in only two samples. Additionally, the model fit was inconsistent across samples, and all analyses were done post hoc, meaning that the presented data was taken from studies that were initially designed for other purposes, which led to methodological limitations. For instance, the present validation did not include nonclinical samples. Furthermore, in two of our three samples, only posttreatment-assessment data on the OESQ was available since the OESQ was not included in the initial study design. Nevertheless, in the third sample (BO), both baseline and posttreatment data was available. In this sample, correlations to related constructs were lower at baseline than at posttreatment-assessment, which underscored that the time of assessment may be relevant in validating questionnaires and that our predominantly posttreatment results may have led to overestimating construct validity. However, most comparable studies assessing the psychometrics of questionnaires for clinical populations do not specify whether participants are currently in treatment and, if they are, what phase of treatment they are in. Only a few studies reporting both pre and post-data are known to us, and they report similar findings (Bastien, Vallières, & Morin, 2001; Leon, Shear, Portera, & Klerman, 1992). We therefore consider this finding important to emphasize:

the time of assessment needs to be closely considered when validating clinical questionnaires for clinical populations. Another important limitation is the samples were exclusively German and clinical; similar previous studies have found correlational analysis to be stronger in community samples compared to clinical samples (Morin, Belleville, Bélanger, & Ivers, 2011). Until further research on the OESQ has been conducted, these important limitations must be considered when interpreting the findings. To date, the OESQ has not been validated in a nonclinical and/or English sample.

These limitations notwithstanding, the findings of the initial validation of the OESQ are promising. In addition to confirming the one-factor structure and showing good internal consistency, the discriminant and incremental validity seems to be superior than that of existing measures for PF. The OESQ thus offers an alternative assessment tool for PF and contributes to the growing need for such tools. Furthermore, we report variations in construct-validity measures depending on the time of assessment (before vs. after treatment), and this seems to be an insufficiently discussed factor in validating clinical psychological questionnaires. Furthermore, capturing the dynamic and complex construct of PF has caused difficulties, and additional comparisons between different assessments of PF might reveal further information about how PF can be assessed most accurately (Kashdan & Rottenberg, 2010; Wolgast, 2014). Additional research regarding the comprehensibility and face validity of the OESQ should also be conducted. Future research on the OESQ should furthermore focus on larger sample sizes and various groups (including nonclinical samples and validation in other languages) to yield a higher generalizability and revalidate our initial findings on the OESQ. The predictive value of the OESQ for functioning, avoidance, and symptomatology noted in this study also needs to be replicated.

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Appendix

Open and Engaged State Questionnaire (translated English Version)

The following questions are about your feelings and emotions (e.g., anxiety, depression, stress, etc.), how you deal with them, and how they influence your life. Please answer the questions on the corresponding scales.

<p>1. How upset and concerned about your feelings & emotions (e.g., anxiety, depression, stress, etc.) were you during the last 7 days?</p> <p>0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10 Not at all very much</p>
<p>2. How much effort did you put into trying to make your feelings & emotions (e.g. anxiety, depression, stress, etc.) or thoughts disappear (e.g. suppress them, distract yourself or seeking courage/reassurance from someone else)?</p> <p>0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10 Not at all very much</p>
<p>3. Imagine that, in general, your life looked like the last 7 days. In what way would these seven days represent a vital, lively and fulfilled lifestyle?</p> <p>0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10 Not at all very much</p>
<p>4. Within the last 7 days, did the way you deal with your feelings & emotions (e.g., anxiety, depression, stress, etc.) keep you from doing something that is really important to you?</p> <p>0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10 Not at all very much</p>

Note: Item 3: Reverse-coded item.

Open and Engaged State Questionnaire (German Version used in Study)

Nachfolgend finden Sie einige Fragen zu Angst/Depression, wie Sie damit umgehen, und wie dies Ihr Leben beeinflusst. Bitte beantworten Sie die Fragen auf den entsprechenden Skalen.

<p>1. Wie aufgebracht und besorgt über Ihre Angst waren Sie in den letzten 7 Tagen im Allgemeinen?</p> <p>0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10 Gar nicht sehr stark</p>
<p>2. Wie sehr haben Sie sich in den letzten 7 Tagen angestrengt, z.B. angstbezogene Gefühle oder Gedanken verschwinden zu lassen (z.B. indem Sie sie unterdrückten; sich selber ablenkten; sich selber beschwichtigten oder Mut/Beschwichtigung bei jemanden anderem suchten)?</p> <p>0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10 Gar nicht sehr stark</p>
<p>3. Stellen Sie sich vor, dass Ihr Leben im Allgemeinen so aussehen würde, wie in den letzten 7 Tagen. Inwiefern würden für Sie diese sieben Tage zu einer vitalen, lebendigen und erfüllten Lebensweise gehören?</p> <p>0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10 Gar nicht sehr stark</p>
<p>4. Behinderte Sie in den letzten 7 Tagen die Art und Weise mit Angst/Depression umzugehen, an irgendetwas in Ihrem Leben, das Ihnen eigentlich wichtig ist?</p> <p>0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10 Gar nicht sehr stark</p>

Note: Item 3: Reverse-coded item.

Table 1.
Confirmatory Factor Analysis of the OESQ: Model-Fit Comparison of Nested Models

Model	Sample	N	χ^2	df	p-value	RMSEA ($\leq .06$)	SRMR ($\leq .08$)	CFI ($\geq .09$)
						[90% CI]		
1 factor, 6 items	PD/AG	114	165.29	14	.000	.309 [.268, .352]	.130	.611
	PD/NR	44	87.88	14	.000	.350 [.282, .422]	.146	.520
	BO	85	56.45	9	.000	.251 [.190, .315]	.592	.808
	All	243	211.26	9	.000	.305 [.270, .341]	.988	.745
1 factor, 6 items (m.i.)	All	243	0.43	4	.980	.000 [.000, .000]	.024	1.00
1 factor, 4 items	PD/AG	114	.19	2	.911	.000 [.000, .073]	.036	1.00
	PD/NR	44	.86	2	.650	.000 [.000, .236]	.167	1.00
	BO	85	1.51	2	.469	.000 [.000, .199]	.161	1.00
	All	243	.10	2	.949	.000 [.000, .009]	.031	1.00

Note. Estimation based on the maximum likelihood method, information criteria in bold when fulfilled; OESQ = Open and Engaged State Questionnaire; RMSEA = root mean square error of approximation with 90% confidence interval; SRMR = standardized root mean square residual; CFI = comparative fit index; TLI = Tucker Lewis index; PD/AG = panic disorder with/without agoraphobia; PD/NR = panic disorder nonresponder; BO = burnout; m.i. = modification indices.

Table 2.

Construct Validity of the OESQ: Correlation with Other Measures of Psychological Flexibility, Core Processes, and Related Constructs

Construct	Measure	Sample	<i>r</i> with OESQ at Post	<i>r</i> with OESQ at Baseline
<u>ACT-related Constructs</u>				
Psychological Flexibility	AAQ-II	PD/AG	-0.67*	N/A
		PD/NR	-.67*	N/A
		BO	-.49*	-.37*
Cognitive Fusion	CFQ	PD/NR	-.70*	N/A
		BO	-.60*	-.42*
Emotion regulation Mindfulness	DERS	BO	-.41*	-.29*
	KIMS-observing	BO	.22*	.11
	KIMS-describing	BO	.38*	.03
	KIMS-acting with awareness	BO	.30*	.34*
Well-being/Mental health	MHC total	BO	.45*	.13
<u>Symptomatology</u>				
Depression	BDI	PD/AG	-.63*	N/A
		BO	-.57*	-.47*
Stress	PSS	BO	-.71*	-.45*
Burnout	MBI-personal accomplishment	BO	.50*	.21*
	MBI-depersonalization	BO	-.59*	-.08
	MBI-emotional exhaustion	BO	-.59*	-.32*
Severity of anxious symptomatology	SIGH-A total	PD/AG	-.71*	N/A
	SIGH-A psychological	PD/AG	-.70*	N/A
	SIGH-A physical	PD/AG	-.63*	N/A
Severity of panic symptoms	PAS total	PD/AG	-.85*	N/A
		PD/NR	-.84*	N/A
	PAS number of panic attacks	PD/AG	-.68*	N/A
		PD/NR	-.71*	N/A
	PAS worries	PD/AG	-.69*	N/A
	PAS disability	PD/AG	-.79*	N/A

Dysfunctional cognition	PAS anxiety	PD/A G	-.75*	N/A
	PAS agoraphobia avoidance	PD/A G	-.54*	N/A
	ACQ agoraphobic cognitions	PD/A G	-.65*	N/A
	BSQ body sensations	PD/A G	-.69*	N/A
<u>Global Functioning</u>				
Total functioning	CGI	PD/A G	-.71*	N/A
		PD/NR	-.68*	N/A
<u>Personality Traits</u>				
Neuroticism	BF-16-AM-N	PD/A G	-.50*	N/A
Extraversion	BF-16-AM-E	PD/A G	.25*	N/A
Openness	BF-16-AM-O	PD/A G	.07	N/A
Agreeableness	BF-16-AM-A	PD/A G	.11	N/A
Conscientiousness	BF-16-AM-C	PD/A G	.36*	N/A
<u>Sociodemographics</u>				
Age		PD/A G	-.05	N/A
		PD/NR	.29	N/A
		BO	-.07	N/A
Sex		PD/A G	.19*	N/A
		PD/NR	-.37*	N/A
		BO	-.06	N/A

Note. Pearson correlation of OESQ = Open and Engaged State Questionnaire with established measures: AAQ-II = Acceptance and Action Questionnaire; DERS = Difficulties in Emotion Regulation Scale; KIMS = Kentucky Inventory of Mindfulness Skills; MHC = Mental Health Continuum; BDI = Beck Depression Inventory; PSS = Perceived Stress Scale; MBI = Maslach Burnout Inventory; SIGH-A = Hamilton Anxiety Scale; PAS = Panic and Agoraphobia Scale; ACQ = Agoraphobic Cognitions Questionnaire; BSQ = Body Sensations Questionnaire; CGI = Clinical Global Impression; BF-16-AM = Big-Five 16-Adjective Measure; PD/AG = panic disorder with/without agoraphobia; PD/NR = panic disorder nonresponder; BO = burnout; * p > .05.

Table 3.

Hierarchical Multiple-Regression Analyses of Psychological Flexibility and Functioning, Avoidance, and Symptomatology

Sample	Predictor	Measure	<u>Model 1</u>		<u>Model 2</u>		ΔR^2	<i>p</i>
			β	<i>p</i>	β	<i>p</i>		
<u>Anxiety (SIGH-A)</u>								
PD/AG	Anxiety sensitivity	ASI	.32	.001	-.14	.137		
	Depressive symptomatology	BDI	.49	.000	-.33	.000		
	Psychological flexibility	OESQ			-.42	.000*	.089	.000*
<u>Burnout: emotional exhaustion (MBI)</u>								
BO	Perceived stress	PSS	.42	.000	.30	.017		
	Depressive symptomatology	BDI	.35	.001	.32	.003		
	Psychological flexibility	OESQ			-.20	.076	.019	.076
<u>Burnout: depersonalization (MBI)</u>								
BO	Perceived stress	PSS	.28	.023	-.03	.820		
	Depressive symptomatology	BDI	.31	.006	-.28	.017		
	Psychological flexibility	OESQ			-.40	.002*	.078	.002*
<u>Burnout: personal accomplishment (MBI)</u>								
BO	Perceived stress	PSS	-.14	.230	-.02	.873		
	Depressive symptomatology	BDI	-.47	.000	-.43	.001		
	Psychological flexibility	OESQ			-.27	.036*	.036	.036*
<u>Panic symptoms (CGI)</u>								
PD/AG	Anxiety sensitivity	ASI	.33	.004	-.10	.383		
	Depressive symptomatology	BDI	.13	.252	-.06	.594		
	Psychological flexibility	OESQ			-.51	.000*	.122	.000*

Agoraphobic avoidance (CGI)

PD/AG	Anxiety sensitivity	ASI	.25	.026	.01	.930		
	Depressive symptomatology	BDI	.31	.006	.10	.379		
	Psychological flexibility	OESQ			-.55	.000*	.142	.000*

Functioning (CGI)

PD/AG	Anxiety sensitivity	ASI	.28	.005	.05	.600		
	Depressive symptomatology	BDI	.43	.000	.24	.011		
	Psychological flexibility	OESQ			-.50	.000*	.117	.000*

Well-being (MHC)

BO	Perceived stress	PSS	-.36	.002	-.35	.013		
	Depressive symptomatology	BDI	-.33	.005	-.33	.004		
	Psychological flexibility	OESQ			.01	.91	.000	.91

Social functioning (FSozU)

PD/AG	Anxiety sensitivity	ASI	-.17	.120	-.09	.483		
	Depressive symptomatology	BDI	-.39	.000	-.33	.004		
	Psychological flexibility	OESQ			-.16	.228	.011	.228

Note. SIGH-A = Hamilton Anxiety Scale; MBI = Maslach Burnout Inventory; CGI = Clinical Global Impression Scale; MHC = Mental Health Continuum; FSozU = Fragebogen zur sozialen Unterstützung; PSS = Perceived Stress Scale, BDI = Beck Depression Inventory; OESQ = Open and Engaged State Questionnaire; PD/AG = panic disorder with/without agoraphobia; PD/NR = panic disorder nonresponder; BO = burnout; * $p > .05$).