

## **Psychometric Properties of the Dutch Anxiety Change Expectancy Scale (ACES-NL)**

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### **ABSTRACT**

Research demonstrates that patients' expectations about treatment outcome are an important predictor of actual psychotherapeutic treatment outcome. So far, only few psychometrically sound expectancy questionnaires are available to assess treatment expectancy. The Anxiety Change Expectancy Scale (ACES) is a promising 20-item questionnaire which measures patients' expectations about being able to change anxiety regarding and regardless from treatment. Psychometric properties of the Dutch language version of the ACES (ACES-NL) are investigated in 212 patients referred to a mental health institute because of suspected anxiety disorders. Reliability (i.e., internal consistency, inter-item, test-retest reliability) is investigated. Validity is examined in terms of internal structure and relations with the Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF), Beck Hopelessness Scale (BHS) and Self-Efficacy Scale (SES). Reliability statistics are good to excellent. Factor analysis reveals a one factor solution. Meaningful relations with relevant MMPI-2-RF scales are established. BHS and SES scores demonstrate satisfactory concurrent and discriminant validity. Treatment outcome expectancy is discussed against the background of relevant models. Further research on predictive validity of the ACES-NL is warranted.

*Key words:* ACES-NL, reliability, validity, prediction, treatment outcome.

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### ***Novelty and Significance***

*What is already known about the topic?*

- Expectancy is an under-investigated subject in psychotherapy outcome research.
- Patients' expectations about treatment outcome are an important predictor of actual treatment outcome in psychotherapy.

*What this paper adds?*

- The ACES-NL is a psychometrically sound questionnaire for measurement of expectations about the ability to control anxiety in the future.
- The ACES-NL can be used to measure patients' expectancies before treatment.
- When patients' expectancies are clear before treatment, clinical strategies to improve expectancies can be used in order to improve treatments and treatment results.

Outcome expectancy is considered to be an important general treatment factor in psychotherapy outcome research and is a subject of interest in research about predictive variables in psychotherapy. Since the 1950's, researchers are interested in how expectations about treatment outcome affect treatment results (Greenberg, Constantino, &

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Bruce, 2006). Tinsley, Bowman, and Ray (1988) mention three reasons why expectancy is important in psychotherapy: (1) it influences seeking help, (2) it affects persistence in therapy, and (3) it affects therapy effectiveness. Expectancy is always, implicitly or explicitly, present in patients, starting in the phase of considering seeking help for (anxiety) symptoms, before and during intake procedures, before and during treatment, at treatment termination, and even in the time thereafter.

Several theories have contributed to research about general working mechanisms in psychotherapy. According to Bandura's (1986) self-efficacy model, positive expectations about treatment can increase self-efficacy, self-confidence, and treatment confidence. This model regards expectancy, conceptualized as belief in change, as one of the key factors that engages a person in constructive behavior. Frank and Frank (1991) also developed a theoretical model about general treatment factors. They emphasize patients' remoralization, the enhanced belief in the possibility of change, to subsequently accomplish better treatment results. In line with this remoralization theory is Tellegen's (2003) conceptualization of demoralization as a general psychopathology factor, based on the dimensional and hierarchical model of affect (Tellegen, Watson, & Clark, 1999). Demoralization goes together with a lack of confidence (e.g., hopelessness, inefficacy, self-defeatedness). In addition, optimism and hope, two psychological constructs that reflect someone's positive expectations about the future or desirable future events, are more recently researched concepts related to expectancy. For instance, the model of Snyder, Ilardi, Michael, and Cheavens (2000) focuses on hope as a cognitive set directed at goal attainment. Thus, self-efficacy, demoralization/remoralization and hope are stated to be important factors contributing to the concept of change expectancy.

Up till now, three systematic reviews and one meta-analytic study on outcome expectancies have been published. Arnkoff, Glass, and Shapiro (2002) reviewed 26 studies between 1963 and 2000 and concluded that the majority of them ( $n=12$ ) reported outcome expectancies to be either positively correlated with treatment results or showing mixed results ( $n=7$ ), while seven found no correlation at all. Dew and Bickman (2005) showed that three quarter of the reviewed studies revealed a significant relationship between outcome expectancy and treatment outcome. Finally, Constantino, Glass, Arnkoff, Ametrano, and Smith (2011) found an effect size of Cohen's  $d= .24$  based on the results of 46 studies, indicating a small but positive effect of outcome expectancy on treatment results. In their systematic review, Delsignore and Schnyder (2007) report mixed findings, with an overall modest but significant effect for anxiety disorders. However, results differ for specific types of anxiety disorders. For example, for social phobia and panic disorders an overall positive relationship was demonstrated between expectancy and treatment results (e.g., Chambless, Tran, & Glass, 1997; Kim, Roth, & Wollburg, 2015; Price & Anderson, 2012; Quero *et alii*, 2015; Safren, Heimberg, & Juster, 1997). Mixed results were reported for generalized anxiety disorder (GAD); Dozois and Westra (2005) reported a positive relationship ( $r= .44$  and  $.46$ ) whereas Borkovec, Newman, Pincus, and Lytle (2002) lacked to find a significant relationship between expectancy and outcome in patients with GAD. Borkovec *et alii* (2002) suggested that cognitive behavioral therapy might not be superior to its components and the use of a one-question expectancy measure, the Expectancy of Improvement Scale (EIS; Borkovec and Mathews, 1988) involves validity issues. For post-traumatic stress disorder, Price, Maples, Jovanovic, Norrholm, Heekin, and Rothbaum (2015) reported a positive relationship between expectancy and treatment results on posttreatment scores of all clinician rated measures and self-report measures. Expectancy was associated with

most of the self-report measure treatment slope scores. However, Van Minnen, Arntz, and Keijsers (2002) were unable to replicate this finding, possibly because they used three non-validated questions to measure expectancy. Obsessive compulsive disorder research demonstrated no relationship between expectancy and treatment results so far (Lax, Basoglu, & Marks, 1992; Steketee, Siev, Fama, Keshaviah, Chosak, & Wilhelm, 2011; Vogel, Hansen, Stiles, & Gøtestam, 2006). The authors report several possible reasons for these non-significant results. For example, depressive symptoms may have overridden the expectancy effect, results may be biased by the use of a single-item scale, or by the timing of the completion of the expectancy measure itself (e.g., not until after session four to six).

Delsignore and Schnyder (2007) attributed above mentioned mixed findings to the complexity and non-linearity of the relationship between expectancy and treatment outcome. Furthermore, published studies strongly varied in study design; almost all studies examined mixed groups, some of them with low sample size. Other studies suffered from methodological limitations like the use of extremely short and non-validated expectancy measures, sometimes consisting of only one question. Also, differences in measurement timing (e.g., before or after the first treatment session) varied across studies.

Worldwide, several expectancy measures are used, all strongly differing in psychometric properties. The Treatment Expectancy Scale (TES; Borkovec & Nau, 1972) and the Credibility Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000) are most used instruments with two important shortcomings: their brevity (i.e., only four and six items respectively) and the content measuring mostly 'credibility' (how believable, convincing and logical the treatment is; Devilly & Borkovec, 2000) instead of expectancy. The same researchers report credibility often to be unrelated to treatment outcome. Other measures are even shorter like the one-item Expectancy of Improvement Scale (EIS; Borkovec & Mathews, 1988) or are specifically designed for social phobia research like the Reaction to Treatment Questionnaire (RTQ; Holt & Heimberg, 1990).

A self-report anxiety expectancy measure is the Anxiety Change Expectancy Scale (ACES; Dozois & Westra, 2005). This scale, which consists of 20 items, measures expectations about being able to change anxiety. The researchers conceptualize anxiety change expectancy as a state measure, because expectancy is likely to vary over time due to several factors such as chronicity of the problems, treatment history, comorbidity, previous change attempts, and general optimism. The ACES was constructed out of items from existing expectancy scales, patients' verbalizations, and expert opinions. Initial reports on psychometric properties are promising (Dozois & Westra, 2005).

Because research suggests expectancy might be an important factor in treatment outcome, more research should be conducted to improve knowledge on the expectancy concept, its measurement and how it relates to the different theoretical models described above. The present study focusses on one of the basic steps in this process and investigates psychometric properties including concurrent and discriminant validity of the Dutch language version of the ACES, the ACES-NL.

Reliability is hypothesized to be reflected in high internal consistency (Cronbach's Alpha  $>.80$ ), good inter-item correlation ( $M_r >.30$ ), and good test-retest reliability ( $r >.80$ ). Despite the idea of outcome expectancy to be a state concept, test-retest reliability is hypothesized to be high because both measures are completed within a short period of time and both before the intake appointment at the institution. Based on the one factor outcome of the original ACES factor analysis, a one component solution for the current principal component analysis is expected.

Hypotheses about validity are based on above mentioned theories; Snyder's (2000) model of hope, Bandura's (1986) model of self-efficacy, Frank and Frank's (1991) theory of remoralization and Tellegen's (2003) conceptualization of demoralization. Strong concurrent validity (i.e.,  $r > .50$ ; Cohen, 1992) is expected between the ACES-NL on the one hand and the Beck Hopelessness Scale (Beck & Steer, 1988), the Self Efficacy Scale (Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982), and relevant scales from the Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008), i.e., (a) Demoralization (RCd) and its subscales Helplessness/Hopelessness (HLP) and Self-Doubt (SFD), (b) Low Positive Emotions Scale (RC2), and (c) Dysfunctional Negative Emotions scale (RC7) on the other hand. Stronger correlations are expected for RCd and HLP in comparison with RC2, RC7 and SFD, because RC2 and RC7 only approximate the concept of demoralization (Tellegen, 1999). A medium correlation (i.e.,  $.30 < r < .50$ ) with the MMPI-2-RF anxiety scale (ANX) is expected, because of an expected relationship between the overall concept of anxiety on the one hand and anxiety change expectancy on the other hand. Finally, strong discriminant validity (i.e., non-significant  $r$ ) is hypothesized for the MMPI-2-RF scales Ideas of Persecution (RC6) and Gastro-Intestinal Complaints (GIC).

## METHOD

### *Participants*

Patients who have been referred to the Vincent van Gogh Institute for Psychiatry with anxiety problems were approached to participate in this study. A total of 294 people signed up for the study, 214 actually returned the questionnaires. Of them, 212 completed the ACES-NL, 210 completed the SES, 209 completed the BHS and 204 completed the MMPI-2-RF. In total 108 participants completed the ACES-NL re-test, within an average time interval of 17.32 days ( $SD = 10.37$ ; range 3-62 days). Participants that met the following criteria on the MMPI-2-RF validity scales: Cannot Say raw scores  $\geq 15$ , VRIN- $r$  and TRIN- $r$  T score  $\geq 80$ , Fp- $r$   $\geq 100$  and L- $r$   $\geq 80$  (Ben-Porath & Tellegen, 2008) were excluded from the study, which led to 166 valid MMPI-2-RF profiles.

The entire sample ( $N = 212$ ; 121 women) with a mean age of 38.76 years ( $SD = 13.92$ ; range 17-79). In the current sample, 13 participants (6%) completed only primary school, 59 (28%) middle school, 82 (39%) Intermediate Vocational Education, 47 (22%) Higher Vocational Education and 11 (5%) university. Of the total sample, 44 participants (21%) lived alone, 56 (26%) with a partner, 70 (33%) with their family, 34 (16%) with their parents and 8 (4%) otherwise. About half of the participants were engaged in work or study, the other half was unemployed. On average, participants ( $n = 178$ ; 34 patients did not answer the specific question) reported having experienced anxiety symptoms for 13.85 years. Of them ( $n = 177$ ), 59 (28%) had not received any treatment yet, 32 (15%) had received one treatment before, the others ( $n = 86$ ; 41%) received more than one treatment before. Most occurring diagnoses (based on clinical interview) were obsessive compulsive disorder ( $n = 54$ ; 26%), panic disorder ( $n = 24$ ; 11%), social phobia ( $n = 22$ ; 10%), post-traumatic stress disorder ( $n = 22$ ; 10%), generalized anxiety disorder ( $n = 15$ ; 7%) and specific phobia ( $n = 8$ ; 4%). Other diagnoses were anxiety disorder not otherwise specified or any form of mood disorder. Most of them had a secondary

anxiety disorder diagnosis or at least experienced anxiety problems, so all participants were included in analyses.

Participation was voluntary and all participants provided written informed consent prior to participation. The study was approved by the Vincent van Gogh Institutional Review Board (Protocol number 13036) and performed in full accordance with the Declaration of Helsinki.

### *Measures*

*Anxiety Change Expectancy Scale* (ACES-NL; Dozois & Westra, 2005; Dutch language version). Is a 20 item self-report questionnaire that measures expectations about the ability to change anxiety. Patients report on a five point Likert scale to which degree they agree with each item. Higher scores correspond to higher expectations about anxiety change. The ACES showed excellent internal consistency (Cronbach's  $\alpha = .89-.92$ ) and good concurrent and discriminant validity in Canadian studies (Dozois & Westra, 2005). David Dozois, the initial developer of the ACES, gave permission to translate de ACES into Dutch. According to procedures described by Brislin (1986) the forward-backward translation method was conducted.

*Minnesota Multiphasic Personality Inventory-2-Restructured Form* (MMPI-2-RF; Ben-Porath & Tellegen, 2008). Consists of 338 items that can be derived from the MMPI-2 booklet. Tellegen and Ben-Porath (2008) and Van der Heijden, Egger and Derksen (2010) confirmed comparability of MMPI-2-RF scale scores derived from either the 567 item MMPI-2 booklet or the 338 item MMPI-2-RF booklet. Average internal consistency coefficients for the Demoralization Scale (RCd; .91) Low Positive Emotions (RC2; .75), Dysfunctional Negative Emotions (RC7; .83) and Ideas of Persecution (RC6; .71) were acceptable for the Dutch Clinical sample ( $N = 1066$ ; Van der Heijden *et alii*, 2008). For the Specific Problem Scales: Helplessness/Hopelessness (HLP), Self-Doubt (SFD), Anxiety (ANX) and Gastro Intestinal Complaints (GIC) Cronbach's  $\alpha$ 's in the Dutch normative sample vary from .48 to .73 (Van der Heijden *et alii*, 2013).

*Beck Hopelessness Scale* (BHS; Beck & Steer, 1988). Is a 20 item self-report questionnaire that measures general negative expectancies about the future. Patients report on true/false scales whether or not they agreed with the item. Higher scores correspond to higher hopelessness. The internal consistency of the BHS is high and ranges from  $r = .84$  to  $.93$  (Hill, Gallagher, Thompson, & Ishida, 1988). One and six week test-retest reliability was  $r = .69$  and  $.66$ , respectively (Dozois & Covin, 2004).

*Self-Efficacy Scale* (SES; Sherer *et alii*, 1982; Dutch language version *Algemene Competentie Schaal*, ALCOS; Bosscher, Smit, & Kempen, 1997). Is a 16 item self-report questionnaire that measures self-efficacy. Patients report on a five point scale to which degree they agree with each item. Higher scores correspond to higher self-efficacy. The ALCOS shows good test-retest reliability ( $r = .84$ ) and good internal consistencies, i.e., Cronbach's  $\alpha$  ranging from  $.86$  to  $.89$  (Bosscher & Baardman, 1989).

### *Procedure*

All patients referred to the Vincent van Gogh outpatient and inpatient clinic for anxiety problems were approached to participate in this study. When patients agreed to participate, they received a package by mail which consisted of an informed consent form, an information leaflet, a short form assessing demographic characteristics, the ACES-NL, the BHS, the SES, and the MMPI-2 booklet. It was emphasized that the questionnaires should be completed before their intake session at the institution. Participants who did not return the packages within two weeks were reminded by means of a phone call.

To measure test-retest reliability, patients filled out the ACES-NL again after they had returned the initial questionnaires, also before their intake appointment. Participants were enrolled over a 18-month period between January 1st 2014 and July 31st 2015. All patients returned the questionnaires before their intake appointment, 92 of 108 also returned the re-test questionnaire before intake.

### *Data analysis*

SPSS 23 was used for data analysis. Cronbach's Alpha and Cohen's Lambda 2 were calculated to measure internal consistency of the ACES-NL. The component structure of the ACES-NL was examined using principal component analysis (PCA) with maximum likelihood extraction and varimax rotation in order to establish which components exist within the data. The number of components to retain was based on results of parallel analysis with 1000 random datasets and theoretical interpretation. Bivariate correlations were utilized to explore test-retest reliability and construct validity. Because of single method variance, only correlations with at least a medium effect size (i.e.,  $r > .30$ ; Cohen, 1992) are interpreted.

## RESULTS

Internal reliability of the ACES-NL was excellent (Cronbach's alpha = .91 and Lambda 2 = .91). Item total correlations were moderate and ranged from .39 to .65 ( $M = .55$ ). Test-retest reliability was good ( $r = .80$  for the total sample,  $N = 108$ , and  $r = .79$  for the pre-intake sample,  $n = 92$ ). Mean ACES-NL pretest score was 61.79 ( $SD = 11.72$ ), mean post-test score was 62.85 ( $SD = 10.81$ ),  $T = -.72$  (two sided);  $p > .05$ .

Based on parallel analysis (Glorfeld, 1995; Horn, 1965) one component was extracted that explained 37% of the variance. Analysis of component coefficient correlations with all concepts available in the data (for example all MMPI-2-RF scales) revealed evidence for this one component solution. Component loadings out of a one component PCA range from .41 (item 10) to .72 (item 17) with a mean of .58 ( $SD = .91$ ).

Correlations between the ACES-NL and other hypothesized concepts to examine concurrent and discriminant validity correlated in expected directions and are presented in Table 1.

*Table 1.* ACES-NL concurrent and discriminant correlations.

Measure	ACES-NL
Beck Hopelessness Scale	-.58**
MMPI Demoralization scale	-.41**
MMPI Low Positive Emotions scale	-.40**
MMPI Dysfunctional Negative Emotions scale	-.31**
MMPI Helplessness/Hopelessness scale	-.38**
Self-Efficacy Scale	-.38**
MMPI Self-Doubt scale	-.40**
MMPI Anxiety scale	-.30**
MMPI Ideas of Persecution scale	-.11
MMPI Gastro-Intestinal Complaints	-.08

*Note:* \*\* =  $p < .01$  (two-tailed)

## DISCUSSION

The present results exemplify good basic psychometric properties of the ACES-NL. Internal consistency is demonstrated to be excellent and test-retest reliability is good. PCA reveals a one component solution to be the best fit and component loadings indicate that all 20 ACES-NL items measure the concept of expectancy consistently. As to construct validity, all hypothesized correlations between the ACES-NL and related concepts are in the expected directions. As hypothesized, high concurrent validity has been found with the most important concept hope, as measured with the BHS. Medium correlations, somewhat lower than expected, were found with the constructs hope, demoralization, and self-efficacy, as measured with several MMPI-2-RF subscales and with self-efficacy, as measured with the SES. As hypothesized, anxiety, as measured with the MMPI-2-RF subscale, exemplified a medium correlation.

On some of the hopelessness measures and all of the self-efficacy measures, medium correlations were found, while high correlations were expected. A possible explanation for these small correlational deviations is that MMPI-2-RF scales measure a rather broad concept. For example, besides hopelessness, the Demoralization Scale (RCd), measures also emotional agitation and discontent with existence, which are only partially related to expectancy. The Low Positive Emotions Scale (RC2) measures an overall depressive mental health state and anhedonia. Hopelessness is a symptom of depression and hopelessness separately shows higher correlations with expectancy than depression. Another example of a concept that only partially overlaps with expectancy is that of Dysfunctional Negative Emotions as represented by RC7. This scale also measures hopelessness, however in relation to anxiety. As the current results show anxiety to correlate only medium to expectancy, the medium correlation with RC7 is plausible. An explanation for the lower correlations with the specific problem scales Helplessness/Hopelessness and Self Doubt may lie in the fact that those scales consist of only four or five items, resulting in possible reliability issues. Another explanation for the small correlational deviations could be that expectancy is more related to a condition or state, like hope, than to behavioral aspects like self-efficacy related behaviors.

Weinberger and Eig (1999) refer to expectancies as 'the ignored common factor in psychotherapy'. An important practical implication of the current research could be that the ACES-NL can be used in research as well as in clinical practice, during assessment and also during psychotherapy. According to Safren *et alii* (1997), 'early detection of low expectancies for treatment outcome should be a priority and should become a specific focus of attention early on in treatment'. Constantino, Glass, Arnkoff, Ametrano, and Smith (2011) gave an overview of clinical strategies to improve treatment outcome expectancies. Explicitly assessing expectancies at the beginning of psychotherapy is the first mentioned strategy and the ACES-NL is a very suitable instrument to achieve this goal. Measuring expectancies beforehand and discussing the results with the patient, may be a promising intervention in order to firstly improve a patients' expectations and secondly improve treatment results, especially in patients with low expectancies.

Some limitations of the current research must be considered, actually only self-report measures were used. Correlations between both measures may therefore be artificially inflated due to shared method variance. On the other hand, self-report measures make it possible to collect a large number of participants. Moreover, only correlations with at least a medium effect (i.e.,  $r > .30$ ) were interpreted to compensate for single

method variance. Additionally, all participants with invalid MMPI-2-RF profiles were excluded from analysis.

Several implications for future research can be formulated. Firstly, interest in researching the ACES arises out of the idea that expectation is an important predictor of treatment outcome and a reasonable implication for future research is to investigate predictive validity of the ACES-NL. In the current research an important contribution for investigating reliability and construct validity has been delivered and is a good starting point for further research. Another interesting avenue is to research change mechanisms in anxiety disorder treatment, based on the assumption that patients' expectancies change over time before, during and after treatment. Some supporting evidence comes from Holt and Heimberg (1990) who report treatment outcome expectancy to be higher after session one for patients in a CBT for social anxiety than after session four.

Taken together, the present study infers that the ACES-NL is a reliable and construct valid self-report questionnaire that can be applied in the treatment of anxiety disorders for the clinical measurement of patients' outcome expectancy as well as the theory-guided interpretation thereof, for instance in terms of demoralization/remoralization, self-efficacy, and hope.

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