



Development of the Demotivating Beliefs Inventory and Test of the Cognitive Triad of Amotivation

Matthias Pillny¹ · Katarina Krkovic¹ · Tania M. Lincoln¹

Published online: 10 July 2018
© Springer Science+Business Media, LLC, part of Springer Nature 2018

Abstract

Recent cognitive models of negative symptoms in psychosis posit that amotivation relevant beliefs are reflected in the cognitive triad of negative beliefs concerning the self, others and the future. The aim of this study was to test the proposed three-factor structure of putative ‘demotivating beliefs’ and to ascertain the strength of their association with self-reported amotivation. We combined existing scales assessing ‘demotivating beliefs’ to the Demotivating Beliefs Inventory. This scale was used for exploratory and confirmatory factor analyses as well as latent regression analyses with amotivation in two independent community ($n_1 = 98$; $n_2 = 347$) and one clinical sample ($n = 36$). We found a three-factor structure with satisfying model fit (‘selfdefeating beliefs’, ‘social indifference beliefs’ and ‘low-expectancy-of-pleasure beliefs’). Each factor showed moderate associations with amotivation (β -coefficients from 0.34 to 0.43; $R^2 = .30$). Our results support the validity of the cognitive triad and its benefit as a framework to analyze demotivating beliefs.

Keywords Avolition · Apathy · Motivation · Reduced activity · Dysfunctional attitudes · Experiential negative symptoms

Introduction

Amotivation is defined as a reduction in the initiation of and persistence in goal-directed activities and the desire to perform such activities (Strauss and Cohen 2017). It is considered as the primary dimension of negative symptoms in psychotic disorders (Foussias and Remington 2010), and predicts the functional impairments in affected patients (Pillny and Lincoln 2016; Rabinowitz et al. 2012). Negative symptoms are thus an important target for pharmacological and psychological therapy. In contrast to positive symptoms, however, for which effective pharmaceutical and psychological interventions were developed over the last decades, negative symptoms tend to be unresponsive to pharmaceutical therapies (Kirkpatrick 2006), and even adverse effects have been reported (e.g. Artaloytia et al. 2006). In regard

to psychological approaches, recent systematic reviews indicate that cognitive therapy has the potential to reduce amotivation in the context of negative symptoms (Aleman et al. 2017; Kirkpatrick et al. 2006; Riehle et al. 2017). However, the effect sizes in these studies are small (for an overview see: Lutgens et al. 2017; Turner et al. 2014; Velthorst et al. 2015) and it has been suggested that outcomes could be improved by focusing more specifically on the mechanisms responsible for symptom formation and maintenance (Lincoln et al. 2017). In order to reach this aim, we need to improve our understanding of the potentially targetable psychological mechanisms that drive amotivation in the context of negative symptoms.

Previous research on therapeutically relevant psychological factors that could account for diminished motivation has largely focused on “dysfunctional” beliefs (Kirkpatrick et al. 2017).¹ In this research, beliefs have been used as a generic

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s10608-018-9940-7>) contains supplementary material, which is available to authorized users.

✉ Matthias Pillny
matthias.pillny@uni-hamburg.de

¹ Clinical Psychology and Psychotherapy, Institute of Psychology, Universität Hamburg, Von-Melle-Park 5, 20146 Hamburg, Germany

¹ We note that different terms such as “dysfunctional”, “irrational” or “maladaptive” have been used to describe people’s appraisals, thoughts, beliefs or attitudes in the field of psychopathology. However, classifying beliefs as dysfunctional may not meet the potential functional aspects of beliefs from a patient’s perspective (Westermann et al., in press). Here, we have decided to use the more neutral term “demotivating beliefs” (i.e. beliefs with negative content that are related to amotivation).

label for a variety of constructs, such as assumptions, expectancies, fears, rules and evaluations (Beck and Haigh 2014). According to cognitive models of negative symptoms in psychosis (Beck et al. 2009, 2017; Beck and Rector 2005), amotivation is a direct consequence of beliefs that can be subsumed in a “cognitive triad” that distinguishes an individual’s negative views of the self, others and the future.

Using a range of different instruments, several studies have found amotivation to be associated with several types of beliefs, of which each appears to match one of the three categories (self, others, future) described in the cognitive triad: In regard to the first category, these studies have found associations between amotivation with negative beliefs about the self [e.g. “I am incompetent, worthless and a failure.”; Lincoln et al. (2011), as measured with the Rosenberg Self-Esteem Scale; von Collani and Herzberg (2003)], and with generalized negative conclusions regarding one’s own performance [i.e. defeatist performance beliefs, e.g. “If I fail partly, it is as bad as being a complete failure.”; Rector (2004), as measured with the Dysfunctional Attitude Scale; DAS; Weissman (1979)]. In regard to the second category, studies show associations between amotivation and negative expectancies of success in social situations (e.g. “I am not going to be good enough.”; Lincoln et al., (2011); as measured with the Frankfurt Scales of Self-concept [Frankfurter Selbstkonzeptskalen; (Deusinger 1986)]) and asociality beliefs [e.g. “Making new friends isn’t worth the energy it takes”; Beck et al. (2013), as measured with the Asociality Belief Scale; ABS; Grant and Beck (2010)]. The relevance of the third category to amotivation is reflected in studies finding it to be associated with negative expectancy of pleasure beliefs [e.g. “When something exciting is coming up in my life, I really look forward to it”; reverse-scored item; Chan et al. (2010), as measured with the anticipatory subscale of the Temporal Experience of Pleasure Scale; Gard et al. (2006)]. Although it appears evident that each of these constructs falls into one of the dimensions of the cognitive triad (Beck et al. 2017), this conclusion is based on a semantic classification and is yet to be factor-analytically confirmed.

Moreover, despite the range of potentially relevant types of beliefs, most of the research on negative beliefs in the context of negative symptoms has focused exclusively on defeatist performance beliefs. A recent meta-analysis on the effect of defeatist performance beliefs on amotivation revealed significant associations in this regard, highlighting the potential relevance of defeatist performance beliefs for amotivation (Campellone et al. 2016). However, the associations reported were of rather small magnitude. A likely explanation for this is that the narrowed focus on specific types of beliefs might be obscuring a stronger association between demotivating beliefs and amotivation. Accordingly, several authors have urged to widen the focus in individual studies and to include a broader spectrum of potentially relevant types of beliefs,

such as those mentioned in the cognitive model (Campellone et al. 2016; Pillny and Lincoln 2016; Staring et al. 2013). A more comprehensive approach to assessing beliefs would also enable us to investigate the validity of the cognitive triad with regard to motivation. Furthermore, it would enable us to investigate whether there are differences in the relevance of certain types of beliefs for amotivation. This would improve our understanding of the factors driving motivation, which is likely to benefit the development of targeted interventions. This type of research would be immensely facilitated by the development of an economic scale that captures a broader range of beliefs related to amotivation, rather than having to use a lengthy set of individual measures, which are likely to overlap in content.

Here we report on the development of the Demotivating Beliefs Inventory (DBI), a comprehensive scale that captures a broad range of beliefs relevant to amotivation and the empirical test of the cognitive triad within the cognitive model of amotivation. The study was conducted by (1) combining the preexisting measures into one questionnaire, selecting the relevant items and exploring the factor structure underlying these items (study one) and (2) testing the construct validity of the postulated three-factor model (i.e. the cognitive triad) and the criterion and discriminant validity by examining the association of each factor with amotivation while controlling for depressive symptoms (study 2).

Since the process of item-selection and factor analysis require large sample sizes comprising the full range of the distribution underlying the construct of interest, we recruited a community sample for study one. Study two was based on a sample including participants from the general population and participants diagnosed with a psychotic disorder and reporting negative symptoms. The inclusion of community samples is justified by the fact that amotivation and other negative symptoms exist along a continuum ranging from people with no indication of amotivation over those with transient or persistent experiences of amotivation to those who are classified as having negative symptoms within the context of a psychotic disorder (e.g. Kaiser et al. 2011; Linscott and van Os 2010).

Study One: Scale Composition and Item Selection

This part of the study had two aims. First, we combined pre-existing measures of beliefs related to amotivation and eliminated items with insufficient factor loadings on the original scale. Second, we conducted an exploratory factor analysis (EFA) to explore the factor structure underlying the selected items.

Method

Measures

We combined the following five self-report scales that assess beliefs that showed associations with amotivation in previous studies and tap into the dimensions of the cognitive triad:

1. Defeatist performance beliefs were measured using the German version of the Defeatist Performance Attitudes subscale (Joormann 2004) of the Dysfunctional Attitude Scale (DAS; Weissman 1979). Participants were asked to indicate their agreement to 18 statements that assess overly generalized negative beliefs about performance (e.g. “If you cannot do something well, there is little point in doing it at all.”), on a 6-point scale ranging from total disagreement to total agreement (1 = strongly disagree, 6 = strongly agree).
2. Asociality beliefs were measured using the 15-item Asocial Beliefs Scale (ABS; Grant and Beck 2010), which was derived from the Revised Social Anhedonia Scale (Eckblad et al. 1982). Participants were asked to indicate their agreement to 15 statements that assess their indifference regarding social interactions (e.g. “Having close friends is not as important as most people say.”).
3. Negative expectancy of success beliefs were measured using the 6-item Social Self-Efficacy subscale of the Self-Efficacy Scale (SSES; Sherer et al. 1982), which has an intuitive overlap with the description of the construct in the cognitive model. Patients were asked to rate their agreement to statements about their perceived self-efficacy in social situations (e.g. “If I see someone interesting who is hard to make friends with, I’ll soon stop trying to make friends with that person.”).
4. Negative beliefs about the self were measured with the German version (von Collani and Herzberg 2003) of the Rosenberg Self-Esteem Scale (RSE; Rosenberg 1965). The RSE is a 10-item scale assessing current levels of global self-esteem. Participants were asked to indicate their agreement to statements about themselves and their perceived worth (e.g. “At times I think that I am no good at all.”).
5. Negative expectancy of pleasure beliefs were measured using the German version (Engel et al. 2015) of the Anticipatory Pleasure subscale of the Temporal Experiences of Pleasure Scale (Gard et al. 2006). Participants were asked to indicate their agreement to each of the 10 items (e.g. “I look forward to a lot of things in my life”, inverse scoring on this item), on a 6-point scale ranging from total disagreement to total agreement.

This resulted in a total of 59 items (DAS = 18 items; ABS = 15 items; SSES = 6 items; RSE = 10 items; TEPS = 10 items). The ABS and the SSES were not available in German language and were thus translated using a back-translation procedure with a final consent rating on each item translation. We further adapted the scaling of both scales and of the RSE to a 6-point scale ranging from total disagreement to total agreement (1 = strongly disagree, 6 = strongly agree) to be consistent with the other scales.

Participants and Procedure

Participants were recruited via print adverts in the facilities of Universität Hamburg and via several internet postings (e.g. Facebook) to participate in an online study. Data was assessed via Unipark, an online platform for questionnaire-based surveys. In each study, all participants gave informed consent to participate voluntarily in an online survey on beliefs and mental health. The 59 items were presented in a randomized order (between subjects). Following the items assessing beliefs, participants were asked to provide social demographic data. A total of $N = 187$ responded to the survey initially. For the analysis, however, we excluded those who did not answer ($n = 89$) or did not confirm ($n = 1$) the probe question at the end of the survey (“Did you understand the questions of the survey and answer honestly?”), which resulted in a sample of; $n = 98$, 49.5%.

The mean age of these participants was 28.8 years ($SD = 7.4$, age range 18–62) and 63% of the participants were female. Most of the participants (62%) had a university degree and were either studying (56%) or were full-time employees (33%). 23% of the participants indicated to have a current diagnosis of a mental disorder. Most frequently, participants reported that they had received a diagnosis of major depression (10%) or an anxiety disorder (8%) and 2% indicated that they had received a diagnosis of a psychotic disorder.

Data Analysis

Data analysis was conducted using IBM PASW Statistics 22.0 (SPSS). First, we investigated the internal consistency by calculating Cronbach’s alpha coefficient for each of the five original scales. We then stepwise eliminated items that decreased Cronbach’s alpha of each scale. Next, we factor analyzed each scale, extracting one factor only and eliminated further items with factor loadings < 0.40 . Finally, we combined the five scales and conducted an EFA to analyze the factor structure underlying the remaining items.

Table 1 Properties of the original scales before and after item selection

Construct	Number of items selected	Internal consistency before/ after item selection	Eigenvalue	Variance explained (%)
Defeatist performance beliefs (DAS)	18/18	0.916	7.614	43
Asociality beliefs (ABS)	11/15	0.814/0.826	4.218	38
Negative expectancy of success beliefs (SSES)	5/6	0.208/0.694	2.300	46
Negative beliefs about the self (RSE)	6/10	0.568/0.861	3.589	60
Negative expectancy of pleasure beliefs (TEPS)	9/10	0.229/0.744	3.046	34
Total	49/59	0.769/0.931	13.20	27

Internal consistency = Cronbach's α -coefficient

DAS Dysfunctional Attitude Scale, ABS Asociality Beliefs Scale, SSES Social Self-Efficacy Scale, RSE Rosenberg Self-Esteem Scale, TEPS Temporal Experience of Pleasure Scale

Results

Item Selection

The characteristics of the scales before and after item deletion are shown in Table 1. The Cronbach's alpha coefficients of the subscales after item selection ranged from 0.694 to 0.916, indicating good to very good internal consistency. After item selection, the final scale resulted in a total of 49 items (DAS = 18 items; ABS = 11 items; SSES = 5 items; RSE = 6 items; TEPS = 9 items). The total scale showed very good internal consistency with $\alpha = 0.931$, explaining 27% of variance in demotivating beliefs.

Factor Analysis

Results of the EFA revealed 13 factors with Eigenvalues > 1.0 whilst the Scree Plot indicated only three factors (see Supplement). However, it has been recommended to base the extraction of factors on both methods, while considering the plausibility of interpretation (Rencher and Christensen 2012). Since the component matrix indicated the three-factor solution as the most readily interpretable solution (i.e. less items loading on more than one factor), we decided to repeat the EFA with the number of factors set to three to further explore the factor loadings of the items.

The results of the second EFA on the 49-item version are shown in Table 2. Factor one included items measuring defeatist performance beliefs (DAS) and negative beliefs about oneself as a person (RSE). Factor two included items measuring beliefs about social aversion (ABS), negative expectancy of success beliefs (SSES) and three additional items from the Defeatist Performance Beliefs subscale (item 10, 22 and 47). The content of these 3 items refers to defeatist performance beliefs in a social context (e.g., "If a person asks for help, it is a sign of weakness."). Thus, we interpreted this factor structure to imply that these items measure beliefs that are more related to beliefs about social aversion and low

expectancy of success in social situations, rather than to the more general construct of defeatist performance and low sense of self-worth, but left the issue subject to further investigation in the next steps of the scale development. Factor three exclusively included beliefs related to low expectancy of pleasure (TEPS). Finally, 3 items from the SSES (item 7, 32 and 36) showed factor loadings < 0.04. However, since the SSES already had the least number of items, we decided to retain these items for further investigation.

Study Two: Confirmatory Factor Analysis and Validity Analysis of the Three-Factor Model

The first aim of this part of the study was to test the construct validity of the cognitive triad. Based on the results of the EFA in study one and the factor structure postulated by the cognitive triad, we expected to confirm a three-factor structure with satisfactory model fit. Furthermore, we aimed to test the criterion validity and the discriminant validity of the DBI. Here, we expected each factor of the DBI to show significant positive associations with amotivation, while controlling for depressive symptoms.

Method

Participants

The sample consisted of $n = 367$ participants from the general population that were either recruited via print adverts on the campus of the Universität Hamburg, adverts in other areas of the city of Hamburg (e.g. in sport clubs and information boards in supermarkets) or online advertising. It also consisted of $n = 36$ patients diagnosed with a psychotic disorder ($n = 22$ schizophrenia; $n = 14$ schizoaffective disorder) that were enrolled in another study investigating the association of anhedonia and social interactions in the daily lives

Table 2 Summary of the rotated factor loadings after exploratory factor analysis (step 1)

Item	Scale	Factor 1	Factor 2	Factor 3
26 If you cannot do something well, there is little point in doing it at all	DAS	0.746	0.283	−0.005
37 If I do not do well all the time, people will not respect me	DAS	0.743	0.273	0.066
30 If I do not do as well as other people, it means I am an inferior human being	DAS	0.739	0.299	−0.057
41 If I am to be a worthwhile person, I must be truly outstanding in at least one major respect	DAS	0.697	−0.006	−0.039
21 If I fail at my work, then I am a failure as a person	DAS	0.693	0.252	−0.068
29 People will probably think less of me if I make a mistake	DAS	0.689	0.222	0.210
44 On the whole, I am satisfied with myself (r)	RSE	0.673	−0.006	0.468
45 I take a positive attitude toward myself (r)	RSE	0.662	0.077	0.413
27 If I fail partly, it is as bad as being a complete failure	DAS	0.660	0.286	−0.038
49 I feel that I'm a person of worth (r)	RSE	0.608	0.099	0.284
38 Taking even a small risk is foolish because the loss is likely to be a disaster	DAS	0.582	0.348	0.018
19 I certainly feel useless at times	RSE	0.576	0.089	0.392
15 I cannot be happy unless most people I know admire me	DAS	0.564	0.047	−0.264
4 If other people know what you're really like, they will think less of you	DAS	0.546	0.296	0.233
14 If I ask a question, it makes me look inferior	DAS	0.530	0.360	−0.060
3 If someone disagrees with me, it probably indicates he does not like me	DAS	0.528	0.482	−0.031
13 People who have good ideas are better than those who do not	DAS	0.518	0.146	0.007
2 If I don't set the highest standards for myself, I am likely to end up a second-rate person	DAS	0.508	−0.032	0.047
1 I feel that I have a number of good qualities (r)	RSE	0.459	0.310	0.402
48 It is best to give up your own interests in order to please other people	DAS	0.455	0.282	0.043
12 I am able to do things as well as most other people (r)	RSE	0.424	0.084	0.373
25 Making new friends isn't worth the energy it takes	ABS	0.312	0.680	0.131
10 I cannot trust other people because they might be cruel to me	DAS	0.312	0.591	0.135
28 People are usually better off if they stay aloof from emotional involvements with most others	ABS	0.171	0.653	0.094
40 People sometimes think I am shy when I really just want to be left alone	ABS	0.220	0.580	−0.096
42 It is difficult for me to make new friends	SSES	0.256	0.564	0.269
39 When things are bothering me, I like to talk to other people about it (r)	ABS	0.140	0.560	0.295
11 I do not handle myself well in social gatherings	SSES	0.230	0.541	0.337
17 I prefer hobbies and leisure activities that do not involve other people	ABS	0.059	0.520	0.309
22 If a person asks for help, it is a sign of weakness	DAS	0.394	0.519	0.065
35 In many ways, I prefer the company of pets to the company of people	ABS	0.064	0.510	0.117
23 I could be happy living all alone in a cabin in the woods or mountains	ABS	0.030	0.494	−0.019
9 I prefer watching television to going out with other people	ABS	0.272	0.472	0.359
8 If given the choice, I would much rather be with others than be alone (r)	ABS	0.009	0.466	0.424
16 I attach very little importance to having close friends	ABS	0.011	0.465	0.017
47 If a person avoids problems, the problems tend to go away	DAS	0.171	0.465	0.027
7 When I am trying to become friends with someone who seems uninterested at first, I don't give up easily (r)	SSES	0.230	0.386	0.153
32 If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person	SSES	0.201	0.230	0.155
43 Having close friends is not as important as most people say	ABS	0.060	0.712	0.003
5 I look forward to a lot of things in my life (r)	TEPS	0.309	0.157	0.599
33 When ordering something of the menu, I imagine how good it will taste (r)	TEPS	0.019	0.143	0.599
34 When I think about eating my favorite food, I can almost taste how good it is (r)	TEPS	0.090	0.115	0.591
31 When something exciting is coming up in my life, I really look forward to it (r)	TEPS	0.123	0.360	0.516
46 When I think of something tasty, like a chocolate chip cookie, I have to have one (r)	TEPS	−0.179	0.004	0.506
20 I get so excited the night before a major holiday I can hardly sleep (r)	TEPS	0.033	−0.120	0.500
24 When I hear about a new movie starring my favorite actor, I can't wait to see it (r)	TEPS	−0.265	0.190	0.468
6 Looking forward to a pleasurable experience is in itself pleasurable (r)	TEPS	0.276	0.110	0.420
18 When I'm on my way to an amusement park, I can hardly wait to ride the roller coasters (r)	TEPS	−0.072	0.023	0.411
36 If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me (r)	SSES	0.099	0.112	0.370
Eigenvalues		8.85	6.63	4.46
% of variance		18.06	13.53	9.09
Conbach's α		0.930	0.877	0.733

Table 2 (continued)

Bold font indicates factor allocation of the respective item

DAS Dysfunctional Attitude Scale, *RSE* Rosenberg Self-Esteem Scale, *ABS* Asociality Beliefs Scale, *SSES* Social Self-Efficacy Scale, *TEPS* Temporal Experience of Pleasure Scale

of the patients (Pillny and Lincoln, unpublished data). In the community sample, 15 participants did not confirm the probe question and further 5 participants had missing data > 50%. These were excluded from further analyses, resulting in $n = 347$ participants recruited from the general population and in a final sample of $N = 383$ participants. The mean age of the community sample was 37.73 years ($SD = 18.54$, age range 18–82), 261 participants were female. Half of the participants (49%) had a high-school diploma or university degree (22%). 66% were university students, 24% were part or full-time employees and 10% were unemployed. 11% indicated that they had a current diagnosis of a mental disorder. Most frequently, participants reported that they had received a diagnosis of major depression (5.5%) or an anxiety disorder (4%). The mean age of the patient sample was 44.22 years ($SD = 10.93$, age range 21–46), 44% of the patients were female, 7% had a university degree and 8% were either full or part time employed.

Measures

Amotivation was assessed with the German version (Engel and Lincoln 2016) of the Motivation and Pleasure Scale-Self Report (MAP-SR; Llerena et al. 2013), a 15-item self-report measure of amotivation that was developed from the Clinical Assessment Interview for Negative Symptoms (Kring et al. 2013). The MAP-SR measures motivation, effort, interest, experience of pleasure and anticipatory pleasure regarding social activities, recreational activities and vocational activities. Participants rate their motivation, effort, interest and pleasure for each activity on a 5-point scale ranging from 0 (not at all motivated; no effort; not at all important to me; no pleasure) to 4 (very motivated; very much effort; extremely important to me; extreme pleasure). Higher scores reflect more amotivation after reverse scoring for all items.

Depression was assessed with the German version (Hautzinger et al. 2012) of the Center for Epidemiological Studies Depression Scale (CES-D; Radloff 1977) in the community sample. The CES-D is a 20-item self-report scale to measure depressive symptoms in epidemiological studies. Participants rate the frequency of depressive symptoms during the past week regarding the major domains of depression (e.g. mood, motivation, somatic symptoms) on a 4-point scale ranging from 0 (“Rarely or none of the time”) to 3 (“Almost all of the time, more than five days”). In the patient sample, depression was assessed with the German version (Müller et al. 1999) of the Calgary Depression Scales for Schizophrenia (CDSS;

Addington et al. 1990). The CDSS is a 9-item semi-structured interview, which was developed to measure depressive symptoms (e.g. depressed mood) in patients with schizophrenia. The participant’s answers are rated by the interviewer on a 4-point scale referring to explicit anchor annotations ranging from 0 (“clearly absent”) to 3 (“severe”).

Data Analysis

We conducted a confirmatory factor analysis (CFA) in Mplus (Muthén and Muthén 2012) to test the construct validity of the new scale. Since χ^2 -values are discussed to be rather inaccurate estimates of model fit (Bentler 2007), we leaned our interpretation on the Comparative Fit-Index (CFI), the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR) that are considered as more robust indices (Furr and Bacharach 2014). Cut-offs for model fit indexes were set at $CFI > 0.9$, $RMSEA < 0.08$ and $SRMR > 0.06$ (Schreiber et al. 2006). The criterion validity was tested by calculating the association of each factor of the DBI with the MAP-SR sum score, using latent regression analysis. We then excluded 2 items of the MAP-SR measuring the anticipation of pleasure and repeated these analyses to control for a potential overlap with the DBI-items measuring negative expectancies of pleasure beliefs. Discriminant validity was tested by calculating the association of each factor with the MAP-SR sum score while controlling for depressive symptoms, which are also related to amotivation and certain beliefs (e.g., Beck 1987). We used the maximum likelihood estimator (MLR) with standard errors for all analyses, which is robust to non-normality and non-independence of observations. This estimator handles missing data by computing maximum likelihood estimates from the available data without imputing missing values. Thus, the maximum likelihood estimate of a data point is the value of the parameter with the highest probability of being observed in the data (Little and Rubin 2002). Using IBM PASW Statistics v22.0 (SPSS), we further examined the amount of explained variance in amotivation by calculating a linear regression model (method: stepwise) predicting amotivation by the three factors of the DBI.

Results

Factor Structure

The CFA of the three-factor model indicated a marginal fit of the initial model ($\chi^2 = 2765.526$; $df = 1124$; $p < .001$;

CFI = 0.69; RMSEA = 0.062; 95% CI [0.06; 0.07]; SRMR = 0.08) with significant correlations between the latent factors ($r = .79$ between factor 1 and factor 2, latent $r = .46$ between factor 1 and factor 3, and latent $r = .57$ between factor 2 and factor 3). However, items 18 (TEPS), 24 (TEPS) and 46 (TEPS) did not load significantly on their respective factor. Moreover, the modification indices showed substantial correlations of the error terms of several items. Therefore, we excluded the 3 items with insufficient factor loadings from further analyses and included the pairwise associations among the error terms of items that showed significant pairwise correlations and then repeated the CFA. This procedure takes into account that items similar in wording or content (e.g. “When ordering something off the menu, I imagine how good it will taste.” and “When I think about eating my favorite food, I can almost taste how good it is.”) may be more closely associated to each other than with the factor they are loading on (e.g. Byrne 2001; Christensen et al. 1999; Wuthrich and Bates 2006).

The CFA on the revised model revealed a satisfactory model fit with $\chi^2 = 1379.02$; $df = 893$; $p < .001$; CFI = 0.90; RMSEA = 0.038; 95% CI [0.034; 0.042]; SRMR = 0.061. However, the amount of variance explained in factor two was not statistically significant in this model and the inspection of the factor loadings of items loading on this factor revealed that items 39, 20 and 8 did not load significantly on this factor. Therefore, we deleted these 3 items and repeated the CFA. This CFA revealed a good model fit with $\chi^2 = 1202.473$; $df = 771$; $p < .001$; CFI = 0.91; RMSEA = 0.038; 95% CI [0.034; 0.042]; SRMR = 0.060. Latent factors were significantly correlated with latent r ranging from .52 to .81. Thus, the results indicate a good fit of the final three-factorial model and good construct validity. In this model, each factor showed good to excellent internal consistency (factor one $\alpha = 0.91$; factor two $\alpha = 0.81$; factor three $\alpha = 0.71$). The final 43-item version of the DBI and the factor loadings of each item can be found in the Supplement.

Associations with Amotivation

The results of the latent regression analysis predicting amotivation while controlling for depression ($\chi^2 = 1360.530$; $df = 851$; $p < .001$; CFI = 0.90; RMSEA = 0.040; 95% CI [0.036; 0.043]; SRMR = 0.061) showed moderate associations of each DBI-factor with amotivation ($\beta = 0.34$, $SE = 0.06$ for factor one; $\beta = 0.43$, $SE = 0.05$ for factor two; and $\beta = 0.43$, $SE = 0.06$ for factor three; all $p < .001$). Depression as a covariate showed significant, but weak associations with factor one ($\beta = 0.30$, $SE = 0.06$, $p < .001$), factor two ($\beta = 0.29$, $SE = 0.06$, $p < .001$) and factor three ($\beta = 0.15$, $SE = 0.06$, $p < .05$). Moreover, amotivation and depression showed a significant association ($\beta = 0.58$, $SE = 0.05$, $p < .001$). The latent regression model predicting the

MAP-SR sum score without the 2 items measuring anticipation of pleasure showed a good model fit ($\chi^2 = 1358.460$; $df = 851$; $p < .001$; CFI = 0.90; RMSEA = 0.039; 95% CI [0.036; 0.043]; SRMR = 0.061). Again, each factor was still significantly associated with amotivation and the decrease in β -coefficients was marginal ($\beta = 0.34$, $SE = 0.06$ for factor one; $\beta = 0.43$, $SE = 0.05$ for factor two; and $\beta = 0.42$, $SE = 0.06$ for factor three; all $p < .001$).

In the linear regression model predicting amotivation (step 1) 20% of the variance in amotivation could be explained by factor one ($R^2 = .199$, $\Delta R^2 = .199$, $\Delta F(1,381) = 94.68$, $p < .001$), adding factor two as a predictor resulted in a significant increase in explained variance (24%, $R^2 = .247$, $\Delta R^2 = .05$, $\Delta F(2,380) = 24.44$, $p < .001$) and adding the third factor to the model resulted in a further significant increase of explained variance in amotivation (30%, $R^2 = .304$, $\Delta R^2 = .06$, $\Delta F(3,379) = 30.64$, $p < .001$).

Additional Analyses in the Clinical Sample

To further investigate the association of the DBI factors with amotivation within the sample of participants with a psychotic disorder, we calculated (1) the Cronbach's alpha coefficients for each factor of the DBI, (2) the differences in means of each factor of the DBI between the two subsamples using ANOVAs and (3) the association of each factor with amotivation using one-tailed Pearson correlation coefficients. We found an internal consistency of $\alpha = 0.88$ for factor one, of $\alpha = 0.55$ for factor two and of $\alpha = 0.66$ for factor three. The means of factor one ($F(1,381) = 14.68$; $p < .001$), factor two ($F(1,381) = 10.15$; $p < .01$) and factor three ($F(1,381) = 9.33$; $p < .01$) were higher in the clinical than in the community sample. Finally, there was a significant association between factor one ($r = .29$, $p < .05$) and factor three ($r = .56$, $p < .001$) with the MAP-SR sum score. However, the association of factor two with the MAP-SR sum score was not significant ($r = -.07$, $p = .34$).

Discussion

We merged existing scales that assess beliefs related to amotivation to the DBI and tested the construct validity of the cognitive triad in two independent samples. As indicated by the exploratory and the confirmatory factor analyses, the 43-item DBI captures three empirically separable dimensions of beliefs, which relate to the cognitive triad: Demotivating beliefs about the self (“self-defeating beliefs”, factor 1), demotivating beliefs about others (“social indifference beliefs”, factor 2) and demotivating beliefs about the future (“low expectancy of pleasure beliefs”, factor 3). Each of these factors explained a comparable amount of variance of the overall scale.

We found moderate associations of self-defeating beliefs, social indifference beliefs and low expectancy of pleasure beliefs with a self-report measure of amotivation (MAP-SR) and each association remained robust while controlling for either symptoms of depression or the two MAP-SR items measuring anhedonia. Therefore, we can rule out that these associations were driven by an overlap with depressive symptoms, which is line with previous studies that reported specific associations of demotivating beliefs and amotivation above and beyond associations with depression (e.g. Pillny and Lincoln 2016; Rector 2004). We can also rule out that our findings result from an overlap with the anhedonia items of the MAP-SR. Thus, our results indicate sufficient criterion and discriminant validity of the DBI and are in line with the notion of a cognitive triad of motivation related beliefs. Importantly, the results of the linear regression models revealed that, compared to the model in which only self-defeating beliefs predicted amotivation, the explained amount of variance in amotivation substantially increased after social indifference beliefs and low expectancy of pleasure beliefs were added to the model as predictors. Moreover, compared to previous studies (e.g. 10% in: Granholm et al. 2017), the amount of variance in amotivation explained by the DBI factors was substantially higher (30%). This seems to confirm our assumption that the small associations of beliefs and amotivation reported in previous studies (e.g., Campellone et al. 2016) could be due to the exclusive focus on defeatist performance beliefs in these studies.

To our knowledge, this is the first study that assessed a comprehensive range of demotivating beliefs and examined the construct validity of the cognitive triad in amotivation. The DBI offers a valid and economical measure of the cognitive triad. The robust associations of the three factors with amotivation highlight the relevance of a comprehensive assessment of demotivating beliefs in research aiming to investigate the contribution of beliefs to the formation and maintenance of amotivation in negative symptoms. For instance, it would be of interest to investigate how demotivating beliefs relate to other psychological constructs associated with negative symptoms, such as deficits in reward learning (e.g. Reddy et al. 2016), in effort allocation (e.g. Hartmann et al. 2015) or emotion regulation (Westermann et al. 2017).

Regarding the therapeutic implications, it is to note that previous studies have found reduced defeatist performance beliefs to partially mediate the effect of psychological therapy on amotivation (e.g. Granholm et al. 2013; Grant et al. 2012). Nevertheless, it could be worthwhile to use the DBI to test whether the consideration of a broader range of beliefs will produce even clearer findings. Moreover, specific therapeutic techniques that enable the therapist to acknowledge the patient's needs might further enhance the therapeutic alliance and outcomes of interventions that aim

to increase goal-directed behavior. For instance, the Motive-Oriented Relationship Building (Westermann et al. 2015), could help the therapist and other practitioners to adapt and acknowledge the potential functionality of these beliefs from a patient's perspective.

The current study has some limitations. Some authors have argued that self-report measures do not capture the behavioral dimension of amotivation sufficiently (e.g. Trémeau et al. 2012). The correlational analyses of the DBI factors with amotivation in our study rely on a self-report measure only. Therefore, one might question whether our findings can be generalized to both dimensions of amotivation. Future studies should address this issue by assessing both the self-report and the behavioral dimension of amotivation, for example by using experience sampling methodology (Kluge et al. 2017). Moreover, it is important to point out that in the patient subsample factor two (social indifference beliefs) showed an insufficient internal consistency and—in contrast to previous work (Granholm et al. 2017; Grant and Beck 2010)—was not significantly related to amotivation. Finally, the interpretation of this finding is hampered by the fact that the analysis was underpowered in the patient subsample. Therefore, further optimization of the DBI, and particularly the investigation of the internal consistency on the item-level of this factor in larger clinical samples is warranted.

To sum up, our findings provide evidence that demotivating beliefs can be matched to the cognitive triad as postulated by Beck et al. (2017) and are associated with self-reported amotivation. This further highlights the relevance of demotivating beliefs to the etiology of negative symptoms in psychosis and supports therapeutic approaches that focus on helping patients to reconsider their thinking with the aim of enabling them to have positive experiences (e.g. Grant et al. 2012, 2018). With the DBI we provide a new instrument that economically captures a broad range of motivation relevant beliefs that can be used as an assessment tool to guide cognitive therapy and in further research on negative symptoms.

Acknowledgements We thank Denise Fischer for her support in recruiting participants, Maik Erdas for his support in the item translation process and Esther Wolfram for her language editing.

Compliance with Ethical Standards

Conflict of Interest Matthias Pillny, Katarina Krkovic and Tania M. Lincoln declare that they have no conflict of interest including any financial, personal or other relationships with other people or organizations within 3 years of beginning the work submitted that could inappropriately influence, or be perceived to influence, their work.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the insti-

tutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Animal Rights This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

References

- Addington, D., Addington, J., & Schissel, B. (1990). A depression rating scale for schizophrenics. *Schizophrenia Research*, *3*, 247–251. [https://doi.org/10.1016/0920-9964\(90\)90005-R](https://doi.org/10.1016/0920-9964(90)90005-R).
- Aleman, A., Lincoln, T. M., Bruggeman, R., Melle, I., Arends, J., Arango, C., & Knegtering, H. (2017). Treatment of negative symptoms: Where do we stand, and where do we go? *Schizophrenia Research*, *186*, 55–62. <https://doi.org/10.1016/j.schres.2016.05.015>.
- Artaloytia, J. F., Arango, C., Lahti, A., Sanz, J., Pascual, A., Cubero, P., ... Palomo, T. (2006). Negative signs and symptoms secondary to antipsychotics: A double-blind, randomized trial of a single dose of placebo, haloperidol, and risperidone in healthy volunteers. *American Journal of Psychiatry*, *163*, 488–493. <https://doi.org/10.1176/appi.ajp.163.3.488>.
- Beck, A. T. (1987). Cognitive models of depression. In R. Leahy & T. Dowd (Eds.), *Journal of cognitive psychotherapy* (1st ed.). New York: Springer.
- Beck, A. T., Grant, P. M., Huh, G. A., Perivoliotis, D., & Chang, N. A. (2013). Dysfunctional attitudes and expectancies in deficit syndrome schizophrenia. *Schizophrenia Bulletin*, *39*, 43–51.
- Beck, A. T., & Haigh, E. A. P. (2014). Advances in cognitive theory and therapy: The generic cognitive model. *Annual Review of Clinical Psychology*, *10*, 1–24. <https://doi.org/10.1146/annurev-clinpsy-032813-153734>.
- Beck, A. T., Himelstein, R., & Grant, P. M. (2017). In and out of schizophrenia: Activation and deactivation of the negative and positive schemas. *Schizophrenia Research*. <https://doi.org/10.1016/j.schres.2017.10.046>.
- Beck, A. T., & Rector, N. A. (2005). Cognitive approaches to schizophrenia: Theory and therapy. *Annual Review of Clinical Psychology*, *1*, 577–606. <https://doi.org/10.1146/annurev.clinpsy.1.102803.144205>.
- Beck, A. T., Rector, N. A., Stolar, N., & Grant, P. (2009). A cognitive conceptualization of negative symptoms. In *Schizophrenia: Cognitive theory research and therapy* (pp. 142–159). New York: Guilford Press.
- Bentler, P. M. (2007). On tests and indices for evaluating structural models. *Personality and Individual Differences*, *42*, 825–829. <https://doi.org/10.1016/J.PAID.2006.09.024>.
- Byrne, B. M. (2001). Structural equation modeling with AMOS, EQS, and LISREL: Comparative approaches to testing for the factorial validity of a measuring instrument. *International Journal of Testing*, *1*, 55–86. https://doi.org/10.1207/S15327574IJT0101_4.
- Campellone, T. R., Sanchez, A. H., & Kring, A. M. (2016). Defeatist performance beliefs, negative symptoms, and functional outcome in schizophrenia: A meta-analytic review. *Schizophrenia Bulletin*, *42*, 1343–1352. <https://doi.org/10.1093/schbul/sbw026>.
- Chan, R. C. K., Wang, Y., Huang, J., Shi, Y., Wang, Y., Hong, X., ... Kring, A. M. (2010). Anticipatory and consummatory components of the experience of pleasure in schizophrenia: Cross-cultural validation and extension. *Psychiatry Research*, *175*, 181–183. <https://doi.org/10.1016/j.psychres.2009.01.020>.
- Christensen, H., Jorm, A. F., Mackinnon, A. J., Korten, A. E., Jacomb, P. A., Henderson, A. S., & Rodgers, B. (1999). Age differences in depression and anxiety symptoms: A structural equation modelling analysis of data from a general population sample. *Psychological Medicine*, *29*, S0033291798008150. <https://doi.org/10.1017/S0033291798008150>.
- Deusinger, I. M. (1986). *Die Frankfurter Selbstkonzeptskalen: (FSKN)*. Göttingen: Hogrefe.
- Eckblad, M. L., Chapman, L. J., Chapman, J. P., & Mishlove, M. (1982). *The revised social anhedonia scale*. Unpublished test.
- Engel, M., Fritzsche, A., & Lincoln, T. M. (2015). Subclinical negative symptoms and the anticipation, experience and recall of emotions related to social interactions: An experimental study. *Psychiatry Research*, *230*, 350–356. <https://doi.org/10.1016/j.psychres.2015.09.015>.
- Engel, M., & Lincoln, T. M. (2016). Motivation and Pleasure Scale-Self-Report (MAP-SR): Validation of the German version of a self-report measure for screening negative symptoms in schizophrenia. *Comprehensive Psychiatry*, *65*, 110–115. <https://doi.org/10.1016/j.comppsy.2015.11.001>.
- Foussias, G., & Remington, G. (2010). Negative symptoms in schizophrenia: Avolition and occam's razor. *Schizophrenia Bulletin*, *36*, 359–369. <https://doi.org/10.1093/schbul/sbn094>.
- Furr, M., & Bacharach, V. (2014). Test dimensionality and factor analysis. In *Psychometrics: An introduction* (2nd ed., pp. 71–98). Los Angeles: SAGE. https://doi.org/10.1111/j.1468-5922.2010.01872_2.x.
- Gard, D. E., Gard, M. G., Kring, A. M., & John, O. P. (2006). Anticipatory and consummatory components of the experience of pleasure: A scale development study. *Journal of Research in Personality*, *40*, 1086–1102. <https://doi.org/10.1016/j.jrp.2005.11.001>.
- Granhölm, E., Holden, J., Link, P. C., McQuaid, J. R., & Jeste, D. V. (2013). Randomized controlled trial of cognitive behavioral social skills training for older consumers with schizophrenia: Defeatist performance attitudes and functional outcome. *American Journal of Geriatric Psychiatry*, *21*, 251–262. <https://doi.org/10.1016/j.jagp.2012.10.014>.
- Granhölm, E., Holden, J., & Worley, M. (2017). Improvement in negative symptoms and functioning in cognitive-behavioral social skills training for schizophrenia: Mediation by defeatist performance attitudes and asocial beliefs. *Schizophrenia Bulletin*, *44*, 653–661. <https://doi.org/10.1093/schbul/sbx099>.
- Grant, P. M., & Beck, A. T. (2010). Asocial beliefs as predictors of asocial behavior in schizophrenia. *Psychiatry Research*, *177*, 65–70. <https://doi.org/10.1016/j.psychres.2010.01.005>.
- Grant, P. M., Huh, G. A., Perivoliotis, D., Stolar, N. M., & Beck, A. T. (2012). Randomized trial to evaluate the efficacy of cognitive therapy for low-functioning patients with schizophrenia. *Archives of General Psychiatry*, *69*, 121. <https://doi.org/10.1001/archgenpsychiatry.2011.129>.
- Grant, P. M., Perivoliotis, D., Luther, L., Bredemeier, K., & Beck, A. T. (2018). Rapid improvement in beliefs, mood, and performance following an experimental success experience in an analogue test of recovery-oriented cognitive therapy. *Psychological Medicine*, *48*, 261–268. <https://doi.org/10.1017/S003329171700160X>.
- Hartmann, M. N., Hager, O. M., Reimann, A. V., Chumbley, J. R., Kirschner, M., Seifritz, E., ... Kaiser, S. (2015). Apathy but not diminished expression in schizophrenia is associated with discounting of monetary rewards by physical effort. *Schizophrenia Bulletin*, *41*, 503–512. <https://doi.org/10.1093/schbul/sbu102>.
- Hautzinger, M., Bailer, M., Hofmeister, D., & Keller, F. (2012). Allgemeine Depressionskala (ADS). *Psychiatrische Praxis*, *39*, 302–304. <https://doi.org/10.1055/s-0032-1326702>.
- Joormann, J. (2004). Die Faktorstruktur der Skala dysfunktionaler Einstellungen (DAS) in einer

- nicht-klinischen Stichprobe. *Diagnostica*, 50, 115–123. <https://doi.org/10.1026/0012-1924.50.3.115>.
- Kaiser, S., Heekeren, K., & Simon, J. J. (2011). The negative symptoms of schizophrenia: Category or continuum? *Psychopathology*, 44, 345–353. <https://doi.org/10.1159/000325912>.
- Kirkpatrick, B. (2006). Editor's introduction: Theme issue on negative symptoms. *Schizophrenia Bulletin*, 32, 212–213. <https://doi.org/10.1093/schbul/sbj061>.
- Kirkpatrick, B., Fenton, W. S., Carpenter, W. T., & Marder, S. R. (2006). The NIMH-MATRICES consensus statement on negative symptoms. *Schizophrenia Bulletin*, 32, 214–219. <https://doi.org/10.1093/schbul/sbj053>.
- Kirkpatrick, B., Mucci, A., & Galderisi, S. (2017). Primary, enduring negative symptoms: An update on research. *Schizophrenia Bulletin*, 43, 730–736. <https://doi.org/10.1093/schbul/sbx064>.
- Kluge, A., Kirschner, M., Hager, O. M., Bischof, M., Habermeyer, B., Seifritz, E., ... Kaiser, S. (2017). Combining actigraphy, ecological momentary assessment and neuroimaging to study apathy in patients with schizophrenia. *Schizophrenia Research*, 195, 176–182. <https://doi.org/10.1016/j.schres.2017.09.034>.
- Kring, A. M., Gur, R. E., Blanchard, J. J., Horan, W. P., & Reise, S. P. (2013). The Clinical Assessment Interview for Negative Symptoms (CAINS): Final development and validation. *American Journal of Psychiatry*, 170, 165–172. <https://doi.org/10.1176/appi.ajp.2012.12010109>.
- Lincoln, T. M., Mehl, S., Kesting, M. L., & Rief, W. (2011). Negative symptoms and social cognition: Identifying targets for psychological interventions. *Schizophrenia Bulletin*, 37, 23–32. <https://doi.org/10.1093/schbul/sbr066>.
- Lincoln, T. M., Riehle, M., Pillny, M., Helbig-Lang, S., Fladung, A. K., Hartmann-Riemer, M., & Kaiser, S. (2017). Using functional analysis as a framework to guide individualized treatment for negative symptoms. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2017.02108>.
- Linscott, R. J., & van Os, J. (2010). Systematic reviews of categorical versus continuum models in psychosis: Evidence for discontinuous subpopulations underlying a psychometric continuum. Implications for DSM-V, DSM-VI, and DSM-VII. *Annual Review of Clinical Psychology*, 6, 391–419.
- Little, R. J. A., & Rubin, D. B. (2002). *Statistical analysis with missing data* (2nd ed.). New Jersey: Wiley.
- Llerena, K., Park, S. G., McCarthy, J. M., Couture, S. M., Bennett, M. E., & Blanchard, J. J. (2013). The Motivation and Pleasure Scale-Self-Report (MAP-SR): Reliability and validity of a self-report measure of negative symptoms. *Comprehensive Psychiatry*, 54, 568–574. <https://doi.org/10.1016/j.comppsyg.2012.12.001>.
- Lutgens, D., Garipey, G., & Malla, A. (2017). Psychological and psychosocial interventions for negative symptoms in psychosis: Systematic review and meta-analysis. *British Journal of Psychiatry*, 210, 324–332. <https://doi.org/10.1192/bjp.bp.116.197103>.
- Müller, M. J., Marx-Dannigkeit, P., Schlösser, R., Wetzels, H., Addington, D., & Benkert, O. (1999). The Calgary Depression Rating Scale for Schizophrenia: Development and interrater reliability of a German version (CDSS-G). *Journal of Psychiatric Research*, 33, 433–443. [https://doi.org/10.1016/S0022-3956\(99\)00018-7](https://doi.org/10.1016/S0022-3956(99)00018-7).
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Pillny, M., & Lincoln, T. M. (2016). Predictors of improved functioning in patients with psychosis: The role of amotivation and defeatist performance beliefs. *Psychiatry Research*, 244, 117–122. <https://doi.org/10.1016/j.psychres.2016.07.018>.
- Rabinowitz, J., Levine, S. Z., Garibaldi, G., Bugarski-Kirola, D., Berardo, C. G., & Kapur, S. (2012). Negative symptoms have greater impact on functioning than positive symptoms in schizophrenia: Analysis of CATIE data. *Schizophrenia Research*, 137, 147–150. <https://doi.org/10.1016/j.schres.2012.01.015>.
- Radloff, L. S. (1977). The CES-D scale. *Applied Psychological Measurement*, 1, 385–401. <https://doi.org/10.1177/014662167700100306>.
- Rector, N. A. (2004). Dysfunctional attitudes and symptom expression in schizophrenia: Differential associations with paranoid delusions and negative symptoms. *Journal of Cognitive Psychotherapy*, 18, 163–173. <https://doi.org/10.1891/jcop.18.2.163.65959>.
- Reddy, L. F., Waltz, J. A., Green, M. F., Wynn, J. K., & Horan, W. P. (2016). Probabilistic reversal learning in schizophrenia: Stability of deficits and potential causal mechanisms. *Schizophrenia Bulletin*, 42, 942–951. <https://doi.org/10.1093/schbul/sbv226>.
- Rencher, A. C., & Christensen, W. F. (2012). Exploratory factor analysis. In A. Field (Ed.), *Methods of multivariate analysis* (4th ed., pp. 435–477). London: SAGE. <https://doi.org/10.1081/E-EBS>.
- Riehle, M., Pillny, M., & Lincoln, T. M. (2017). Are the negative symptoms of schizophrenia treatable at all? A systematic review on efficacy studies for targeted psychological interventions for negative symptoms. *Verhaltenstherapie*, 27, 199–208. <https://doi.org/10.1159/000478534>.
- Rosenberg, M. (1965). Rosenberg self-esteem scale (RSE). Acceptance and commitment therapy. Measures Package, 61, 52.
- Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of Educational Research*, 99, 323–338. <https://doi.org/10.3200/JOER.99.6.323-338>.
- Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R. W. (1982). The Self-Efficacy Scale: Construction and validation. *Psychological Reports*, 51, 663–671. <https://doi.org/10.2466/pr0.1982.51.2.663>.
- Staring, A. B. P., ter Huurne, M.-A. B., & van der Gaag, M. (2013). Cognitive behavioral therapy for negative symptoms (CBT-n) in psychotic disorders: A pilot study. *Journal of Behavior Therapy and Experimental Psychiatry*, 44, 300–306. <https://doi.org/10.1016/j.jbtep.2013.01.004>.
- Strauss, G. P., & Cohen, A. S. (2017). A transdiagnostic review of negative symptom phenomenology and etiology. *Schizophrenia Bulletin*, 43, 712–729. <https://doi.org/10.1093/schbul/sbx066>.
- Trémeau, F., Nolan, K. A., Malaspina, D., & Javitt, D. C. (2012). Behavioral validation of avolition in schizophrenia. *Schizophrenia Research*, 138, 255–261. <https://doi.org/10.1016/j.schres.2012.02.018>.
- Turner, D. T., van der Gaag, M., Karyotaki, E., & Cuijpers, P. (2014). Psychological interventions for psychosis: A meta-analysis of comparative outcome studies. *American Journal of Psychiatry*, 171, 1–16. <https://doi.org/10.1176/appi.ajp.2013.13081159>.
- Velthorst, E., Koeter, M., van der Gaag, M., Nieman, D. H., Fett, A. J., & Smit, F. (2015). Adapted cognitive – behavioural therapy required for targeting negative symptoms in schizophrenia: Meta-analysis and meta-regression. *Psychological Medicine*, 45, 453–465. <https://doi.org/10.1017/S0033291714001147>.
- von Collani, G., & Herzberg, P. Y. (2003). Eine revidierte Fassung der deutschsprachigen Skala zum Selbstwertgefühl von Rosenberg. *Zeitschrift Für Differentielle Und Diagnostische Psychologie*, 24, 3–7. <https://doi.org/10.1024/0170-1789.24.1.3>.
- Weissman, A. (1979). Dysfunctional Attitude Scale (DAS). Acceptance and commitment therapy. Measures 54. Retrieved from <http://integrativehealthpartners.org/downloads/ACTmeasures.pdf>.
- Westermann, S., Cavelti, M., Heibach, E., & Caspar, F. (2015). Motive-oriented therapeutic relationship building for patients diagnosed with schizophrenia. *Frontiers in Psychology*, 6, 1294. <https://doi.org/10.3389/fpsyg.2015.01294>.
- Westermann, S., Gantenbein, V., Caspar, F., & Cavelti, M. (in press). Maintaining delusional beliefs as means for the satisfaction and protection of psychological needs. *Zeitschrift Für Psychologie*, 226(3).
- Westermann, S., Grezellschak, S., Oravec, Z., Moritz, S., Lüdtker, T., & Jansen, A. (2017). Untangling the complex relationships between symptoms of schizophrenia and emotion dynamics in daily life: Findings from an experience sampling pilot study.

Psychiatry Research, 257, 514–518. <https://doi.org/10.1016/j.psychres.2017.08.023>.

Wuthrich, V. M., & Bates, T. C. (2006). Confirmatory factor analysis of the three-factor structure of the Schizotypal Personality

Questionnaire and Chapman schizotypy scales. *Journal of Personality Assessment*, 87, 292–304. https://doi.org/10.1207/s15327752jpa8703_10.