

Measuring Volitional Competences: Psychometric Properties of a Short Form of the Volitional Components Questionnaire (VCQ) in a Clinical Sample

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Abstract: Volitional competences (skills of will), including self-regulation skills such as self-motivation and emotion regulation and self-control skills such as impulse control, are particularly necessary for patients with psychiatric and psychosomatic disorders. The Volitional Components Questionnaire (VCQ) is an instrument designed to measure volitional competences. However, its length of 190 items prevents its routine application in clinical settings. This study evaluates a new 36-item short form of the VCQ. 1018 inpatients of a psychosomatic rehabilitation clinic completed the VCQ and several measures of psychopathology, personality, and cognitive ability. Exploratory factor analysis identified six factors. Confirmatory factor analysis showed that the VCQ-36 shared several volitional components with the original VCQ. Most of the self-regulation competences correlated negatively with psychopathological measures such as depression, as well as with neuroticism, social inhibitedness, and excitability, and positively with extraversion. Impulse control was also negatively associated with neuroticism and excitability. No meaningful correlation with cognitive ability was observed. The VCQ-36 is a reliable and valid instrument for assessing volitional competences and is well suited for routine application in clinical settings.

INTRODUCTION

The basic constituent in most approaches to volition is the human capacity to regulate other psychological functions such as emotion, motivation, and cognition in order to reach challenging goals that require some sort of volitional regulation. Several theories of volition have been proposed, with labels such as willpower [1], ego strength [2], action orientation [3, 4], self-regulation [5-10], self-control [7, 8, 11], and volition [12-14].

Some theoretical conceptions focus on single volitional competences without directly referring to volition as the superordinate concept (e.g., motivation regulation [15, 16], emotion regulation [17-21], and attention regulation [22, 23]). In his theory of self-regulation, Kuhl [7, 8] offers a comprehensive approach to the variety of volitional competences that are utilized by an individual to regulate other psychological functions. This theory forms the volitional part of a broader theory of volitional action regulation [9, 14]. Volition, or the will, is conceptualised as the central control instance which coordinates mental processes and subsystems in a way that the implementation of intentions is optimized. The most important mental subsystems that have to be coordinated according to an intention are attention, motivation, emotion, activation, cognition, and behaviour. Volition is

differentiated into several volitional competences, which can be described as either consciously deployable strategies or unconsciously represented mechanisms.

The volitional competences are grouped into two basic modes of volition: self-regulation and self-control. Kuhl [7, 8, 27] conceptualizes self-control as the self-disciplining mode of volition. Subsystems such as motivation or emotion that are at variance with the active intention are inhibited. Self-control comprises goal recollection, forgetfulness prevention, planning skill, impulse control, and initiating control. Self-regulation is conceptualized as the self-integrating mode of volition. Subsystems interact and are modified in order to unite as many subsystems as possible behind an intention. Self-regulation comprises attentional focusing, self-motivation, emotion regulation, self-activation, self-relaxation, decision regulation, and coping with failure.

Although theories of volition have mainly been developed in the field of basic psychology, they have been extensively applied in clinical, health, educational, and organizational psychology. Volitional competence promotes recovery from stress [24] and correlates with positive attitudes (e.g., self-confidence, optimism) and with fewer reports of anxiety and depression [6, 11, 25]. Deficits in volitional competence are associated with various psychiatric disorders [26-28] and are probably a vulnerability factor for anxiety disorders [29] and depression [30]. Self-regulation is also associated with better social relationships and interpersonal skills [11, 31]. Volitional competences predict studying behaviour [32], higher school grades [11], and enactment of transfer intentions in management training [33].

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Measures of Volition

Several measures of volition have been proposed, including the Action Control Scale (ACS) [34], the Locomotion and Assessment Questionnaire (LAQ) [6], the Self-Control Scale (SCS) [11], the Self-Regulation Scale (SRS) [25], and the Emotion Regulation Questionnaire (ERQ) [17]. However, only the Volitional Components Questionnaire (VCQ) by Kuhl [27] measures the variety of volitional competences conceptualized in the theory of self-regulation [7, 8]. The VCQ is available as a long (VCQ-L) and short form (VCQ-S) [35]. The VCQ-L consists of 38 scales (5 items per scale) making up four sections. Fourteen scales measure the volitional competences that constitute the two modes of volition (nine self-regulation and five self-control scales). Thirteen scales assess symptoms of reduced access to these volitional competences under conditions of frustration or stress ("state orientation"). Two scales measure volitional and general self-confidence. Finally, nine scales assess symptoms of spontaneous control without volitional activity ("volition avoidance"). The test person rates the extent to which each item applies to him-/herself on a 4-point Likert scale (0 = not applicable, 3 = wholly applicable). The internal consistency of the scales is reported to be moderate to high (Cronbach's α between .67 and .90) [36]. Norm values are available separately for women and men (obtainable from the test authors).

The VCQ-S, the official short form, consists of 12 scales selected from the 38 scales of the VCQ-L [35]. Only some of the volitional competences identified can be measured with this instrument: five of the nine self-regulation competences (self-determination, attentional focusing, self-motivation, self-relaxation, coping with failure) and two of the five self-control competences (planning skill and initiating control).

The external validity of the VCQ-L and VCQ-S is supported by a variety of studies [36]. First, several studies have shown that the instruments predict the enactment of difficult behaviours requiring self-regulation or self-control, such as children's resistance to temptation (see [27]), the implementation of therapy intentions [28, 37], the enactment of transfer intentions in management training [33], and studying behaviour [32]. Second, inhibited access to one's own feelings ("alienation") correlates positively with VCQ scales measuring introjection and external control of action, and negatively with scales measuring self-determination [35, 36]. Third, the validity of the VCQ is supported by studies showing the negative health outcomes of deficits in self-regulation [27, 28].

The Present Study

The aim of the present study is to construct a short form of the VCQ that fulfils two criteria. First, it should require not more than 10 minutes to complete, making it suitable for use in routine clinical care. Second, it should cover almost all volitional competences postulated in the theory of self-regulation [7, 8] and assessed with the VCQ-L [27]. The problem with the existing VCQ-S is that it omits three important self-regulation competences (self-activation, emotion regulation, decision regulation) and three equally important self-control competences (goal recollection, forgetfulness prevention, impulse control). These scales are essential to a measure of volitional competence for theoretical and clinical

reasons: emotion and decision regulation as well as impulse control are among the major domains of volitional control [11] and are relevant in clinical practice. Emotion regulation is one of the main targets of psychotherapy, self-activation and decision regulation are important outcome variables in the treatment of depression, and impulse control is central in disorders involving over-control of impulses (e.g., obsessive-compulsive disorder, anorexia) or under-control of impulses (e.g., substance abuse, binge-eating disorder). In conclusion, there is a need for a new short form of the VCQ covering the whole range of volitional competences.

Therefore, the present study was aimed at developing a short form of the VCQ that (a) is confined to the scales measuring volitional competences, and (b) reduces the number of items per scale. This paper reports the psychometric properties of a 36-item version of the VCQ, its factorial structure as assessed by exploratory and confirmatory factor analysis, and the relation of the volitional components to other constructs including psychopathology, personality, and cognitive ability. We chose to test the instrument's psychometric properties in a clinical sample in order to replicate previous findings (e.g., [27]) in samples of psychosomatic inpatients.

Previous findings have shown that self-regulation competences are related to more positive emotions, fewer negative emotions, and less psychopathology, while self-control competences exhibit the opposite pattern [38]. Therefore, we expected to find meaningful negative correlations between psychopathology and self-regulation competences, and positive correlations between psychopathology and self-control competences. No such association was expected for physical complaints. Because of their associations with affectivity, self-regulation competences were also expected to show negative associations with personality characteristics such as neuroticism, social inhibitedness, and excitability, and a positive association with extraversion. These hypotheses can also be derived from the results of the VCQ-L [27]. Although we did not expect to find a meaningful correlation with cognitive ability (see [27]), we expected self-regulation (but not self-control) to be associated with achievement orientation. Finally, as found with the VCQ-L, we expected higher volitional competences in men than in women [27].

METHOD

Sample and Procedures

All inpatients ($n = 1590$) admitted to a psychosomatic rehabilitation centre between April 2002 and September 2003 were invited to participate after being given information about the study. 1018 patients agreed to participate (64%). The psychiatric and psychosomatic disorders treated in the clinic were affective, anxiety, eating, adjustment, and somatoform disorders as well as tinnitus and obesity, diagnosed according to ICD-10 (World Health Organization, [39]). Not admitted to the clinic were patients with drug or alcohol addiction, acute risk of suicide, brain disorder or acute psychosis. The patients completed all questionnaires in two sessions on the second and third day after their admission. All patients provided written informed consent, and the study protocol was approved by the ethics committees of the regional medical authority.

36-Item Short Form of the VCQ (VCQ-36)

As described in the introduction, the VCQ-L is made up of four sections, one of which assesses fourteen volitional competences. The self-regulation competences measured are attentional focusing (item example: “If I want to, I am able to deliberately concentrate on whatever is important at the moment”), self-motivation (e.g., “I can usually motivate myself quite well if my determination to persevere weakens”), emotion regulation (e.g., “I can deliberately think of pleasant things in order to make much better headway”), self-activation (e.g., “I often get really activated when something is difficult”), self-relaxation (e.g., “I am able to relax quickly even after some inner tension”), decision regulation (e.g., “When I think about doing or not doing something, I usually arrive at a decision quickly”), and coping with failure (e.g., “I usually have to repeat a mistake in order to avoid making it once and for all”). The self-control competences measured are goal recollection (e.g., “As long as I have not settled a matter, I repeatedly remind myself of the things I want to do”), forgetfulness prevention (e.g., “I often use memory aids in order to do what I intend to do at the appropriate time”), planning skill (e.g., “Before starting on something new, I usually make a plan”), impulse control (e.g., “When a temptation arises, I often feel defenceless”), and initiating control (e.g., “If a task has to be finished, I prefer to start it immediately”). These twelve scales, each of five items, result in a total of 60 items. Two further scales, unconscious attention control and self-determination, were omitted because their content was thought to be covered by other scales (e.g., attentional focusing and self-motivation). Validity and reliability of all scales are described in the introduction. In order to develop the 36-item short form, we selected the three items with the highest item–scale correlation from each of the twelve scales. Item and scale characteristics of the VCQ-36 are reported in the results section.

External Criteria

Depression was assessed by the Center for Epidemiological Studies Depression Scale (CES-D) [40] in its German version [41], a widely used self-report scale measuring depressive symptoms. Total psychiatric symptomatology was measured by the Symptom Checklist-9 (SCL-9) [42], a German short form of the widely used SCL-90-R [43]. For the construction of the unidimensional SCL-9, one item of each SCL-90-R scale with the highest correlation with the Global Severity Index (GSI), the mean of all nine original SCL-90-R scales, was chosen. Physical complaints were assessed by the Giessen Subjective Complaints List (Giessener Beschwerdebogen, GBB) [44], with the five scales fatigue, stomach trouble, pain, dyscardia, and a total value for physical complaints. Personality structure was assessed using the Freiburg Personality Inventory (Freiburger Persönlichkeits-Inventar, FPI) [45], a personality questionnaire frequently used in Germany. Five scales were selected on the basis of our hypotheses: achievement orientation, inhibitedness, excitability, extraversion, and neuroticism. The Digit Connection Test (Zahlen-Verbindungs-Test, ZVT) [46] was used to assess the basal cognitive speed underlying all intelligent performances. This is largely equivalent to the speed component of common intelligence tests.

Data Analysis

Descriptive statistics include means, standard deviations, Cronbach’s α (internal consistency), adjusted item–score correlations, skewness and kurtosis of scales. Sub-sample and sex differences were tested using *t*-tests or χ^2 -tests. For the application of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), the sample was divided into two halves. EFA was used to examine the factor structure of the new VCQ-36, with parallel analysis (PA) [47] as extraction method. As an empirically supported and objective method for determining the most optimal number of factors to extract, PA is widely recommended by statisticians [48].

Four CFA models were tested for the variance–covariance matrix using the AMOS 6.0 statistical package. The maximum likelihood method was used, and correlations between the latent variables (factors) were included. The main estimates of a model’s fit to the data were the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR). RMSEA values of .06 or less are said to reflect a model with a good fit to the data, and values between .06 and .08 to reflect an adequate fit [49]. SRMR values of .06 and less suggest a good fit to the data, while values between .06 and .11 suggest an adequate fit [49]. We also report comparative fit indices, the Akaike information criterion (AIC) and the Bayes information criterion (BIC). If the standard fit indices (RMSEA and SRMR) are acceptable, the model with the lowest AIC and BIC is to be preferred.

To investigate the association between volitional competences and external criteria, we calculated zero-order correlations. Because many significant correlations were to be expected given the large sample, only correlations with medium or high effect sizes ($r \geq .25$) were interpreted as meaningful.

RESULTS

Characteristics of the Sample

Table 1 shows the characteristics of the sample.

Descriptive Statistics

Table 2 shows means and standard deviations of the items as well as adjusted item–scale correlations for the original VCQ-L and the new VCQ-36. The item–scale correlations ranged between .40 and .75. Table 3 presents means, standard deviations, and internal consistencies of the VCQ-36 scales. Females showed significantly lower scores on most scales. Cronbach’s α coefficients ranged between .56 and .92, with most lying above .75. Skewness and kurtosis values were in the -1 to +1 interval, indicating that all scales had a normal and symmetrical distribution.

Differences between Disorders

As Table 1 shows, depressive disorders are the most frequent disorders in this sample. In fact, 55% of the sample has a depressive syndrome (incl. depressive episode, recurrent depressive disorder, and dysthymia; see Table 4). The question arises as to whether depressed and non-depressed patients differ on VCQ-36 scales. Table 4 presents the means of the VCQ-36 scales for all disorder-related subsamples.

Table 1. Demographic Characteristics of the Sample (N = 1018)

Variables	M or %	SD or n
Age	42.8	11.54
Gender (female)	76.0	774
Marital status		
Single	21.6	220
Married	49.0	499
Divorced/separated	24.2	262
Widowed	4.0	41
Highest educational attainment		
Did not complete primary school (< 9 yr)	1.6	16
Primary school I (9 yr)	8.8	90
Primary school II (10 yr)	5.5	56
Vocational training (12-13 yr)	61.9	630
High school (13 yr)	2.2	22
University (> 15 yr)	11.0	112
Not indicated	9.0	92
Depressive symptoms (CES-D, <i>t</i> -value)	61.95	9.33
Total psychiatric symptomatology (SCL-9, <i>t</i> -value)	79.65	1.39
Physical symptoms (GBB, <i>t</i> -value)		
Fatigue	68.32	14.85
Stomach trouble	57.96	14.18
Pain	61.94	12.22
Dyscardia	62.27	15.43
Total physical complaints	65.22	12.87
Most frequent diagnoses		
Depressive episode	26.9	274
Recurrent depressive disorder	20.6	210
Adjustment disorder	19.7	201
Anxiety disorder ^a	20.1	204
Tinnitus	19.4	197
Obesity	21.2	216
Hypertension	16.4	167

^a Anxiety disorders involves agoraphobia, social phobia, specific phobia, panic disorder, and generalized anxiety disorder.

There were no significant differences between most non-depressed subsamples and depressed patients. Patients with phobic disorders exhibit significantly lower self-regulation skills, but not self-control skills, than depressed patients. By contrast, patients with adjustment disorders have significantly higher self-regulation and self-control skills, i.e., they are less impaired in volition than depressed patients. Finally, impulse control is especially highly impaired in patients with bulimia nervosa and overeating, but not in patients with anorexia nervosa.

Exploratory Factor Analyses

In order to examine construct validity, a PCA of the 36 items with Varimax rotation was carried out using one half of the sample, after previously measuring sample adequacy

by means of the Kaiser-Meyer-Olkin test (KMO = .917) and Bartlett's test of sphericity (approx. $\chi^2(630) = 8429.995$; $p < .001$). Using parallel analysis as extraction method, we identified six significant factors, which, taken together, accounted for 56.36% of the total variance (see Table 5). Factor 1, labelled motivation, emotion, and relaxation regulation, contains all items of the self-motivation, emotion regulation, and self-relaxation scales, plus one impulse control item (Im3) and one attentional focusing item (At1), both of which also concern the regulation of inner processes. Factor 2, labelled planning and goal recollection, consists of all items of these two scales. Factor 3, labelled decision, activation, and attention regulation, consists of all items of the decision regulation and self-activation scales, plus two attentional focusing items that relate to starting action with one's full concentration. Factor 4, labelled coping and impulse

Table 2. Item Characteristics: Means, Standard Deviations, and Item–Scale Correlations (N = 1018)

No.	Short Description of Items*	M	SD	r_{it-sc} (VCQ-L)	r_{it-sc} (VCQ-36)
	Attentional focusing				
At1	Deliberately increasing concentration	1.26	.87	.65	.65
At2	Deliberately concentrating on task-relevant information	1.56	.83	.65	.70
At3	Starting with full concentration	1.54	.81	.63	.66
	Self-motivation				
Mo1	Knowing how to increase pleasure in something	.94	.78	.64	.61
Mo2	Motivating oneself to persevere	1.15	.78	.63	.59
Mo3	Finding a way to make an activity fun again	.96	.74	.60	.57
	Emotion regulation				
Em1	Deliberately thinking of pleasant things	.95	.77	.71	.64
Em2	Altering one's mood for easier execution of tasks	.82	.74	.67	.65
Em3	Overcoming an unpleasant mood	.89	.73	.65	.62
	Self-activation				
Ac1	Getting activated on difficult tasks	1.19	.91	.76	.75
Ac2	Getting into best form when difficulties arise	1.04	.97	.74	.75
Ac3	Becoming more active when obstacles arise	1.18	.88	.65	.63
	Self-relaxation				
Re1	Relaxing quickly after inner tension	.63	.72	.67	.67
Re2	Reducing excessive excitation	.75	.73	.65	.67
Re3	Deliberately reducing nervousness	.68	.73	.60	.61
	Decision regulation				
De1	Taking a decision quickly about doing or not doing something	1.33	.84	.63	.61
De2	Arriving at a decision quickly	1.63	.93	.57	.55
De3	Feeling clearly that a decision was correct	1.44	.83	.55	.53
	Coping with failure				
Co1	Repeating a mistake (-)	1.18	.89	.64	.63
Co2	Learning from mistakes quickly	1.49	.84	.63	.57
Co3	Not being able to change behaviour quickly (-)	1.27	.83	.63	.62
	Goal recollection				
Go1	Repeatedly reminding myself of things to do	1.59	.85	.54	.56
Go2	Rehearsing the things to do	1.79	.77	.53	.54
Go3	Keeping non-finished things in mind	1.87	.74	.49	.54
	Forgetfulness prevention				
Fo1	Using memory aids	1.69	.96	.42	.51
Fo2	Needing no memory aids (-)	1.11	.90	.40	.40
Fo3	Writing down important things	2.02	.85	.42	.52

(Table 2) contd....

No.	Short Description of Items*	M	SD	r _{it-sc} (VCQ-L)	r _{it-sc} (VCQ-36)
Planning skill					
Pl1	Making a plan before starting on something new	1.51	.93	.70	.66
Pl2	Determining the procedure before starting	1.74	.84	.69	.69
Pl3	Going over the details before starting	1.70	.84	.63	.62
Impulse control					
Im1	Feeling defenceless when exposed to temptation (-)	1.11	.81	.50	.48
Im2	Inability to resist a sudden impulse (-)	1.28	.78	.48	.48
Im3	Ability to suppress everything in me	1.13	.81	.39	.36
Initiating control					
In1	Tackling a task immediately	1.69	.91	.73	.73
In2	Starting something immediately	1.62	.95	.69	.73
In3	Beginning something without hesitation	1.61	.88	.67	.65

Notes: *The full set of VCQ items in German and English can be obtained from Prof. Julius Kuhl, University of Osnabrück, Germany. Range 0-3 (0 = not applicable, 3 = wholly applicable); (-) inverted item; r_{it-sc} (VCQ-L): adjusted item-scale correlations in the original VCQ; r_{it-sc} (VCQ-36): adjusted item-scale correlations in the new VCQ-36.

Table 3. Scale Characteristics of the VCQ-36: Means, Standard Deviations, and Internal Consistency

Scale	Total (N = 1018)			Female (N = 774)			Male (N = 244)			Sex diff.
	M	SD	α	M	SD	α	M	SD	α	t-test
Self-regulation	3.57	1.52	.92	3.43	1.46	.91	4.00	1.62	.93	-5.10***
Attentional focusing	4.37	2.14	.82	4.28	2.14	.82	4.63	2.13	.82	-2.18*
Self-motivation	3.05	1.89	.76	2.92	1.86	.74	3.47	1.90	.79	-4.01***
Emotion regulation	2.66	1.88	.79	2.53	1.85	.79	3.09	1.92	.80	-4.05***
Self-activation	3.41	2.42	.84	3.26	2.41	.85	3.88	2.38	.83	-3.50***
Self-relaxation	2.05	1.85	.80	1.87	1.74	.78	2.63	2.05	.84	-5.21***
Decision regulation	4.40	2.11	.74	4.31	2.09	.72	4.69	2.14	.79	-2.46**
Coping with failure	5.04	2.13	.77	4.86	2.11	.77	5.60	2.09	.77	-4.77***
Self-control	5.09	1.22	.82	5.06	1.25	.82	5.18	1.14	.80	-1.29
Goal recollection	5.25	1.90	.73	5.29	1.92	.73	5.11	1.85	.70	1.32
Forgetfulness prevention	5.59	2.02	.60	5.69	2.04	.61	5.27	1.92	.57	2.83**
Planning skill	4.94	2.22	.81	4.77	2.27	.81	5.50	1.95	.77	-4.93***
Impulse control	4.74	1.78	.59	4.62	1.79	.59	5.13	1.70	.58	-3.93***
Initiating control	4.92	2.38	.84	4.94	2.39	.84	4.87	2.36	.85	.36

Notes: Range 0-9; α: Cronbach's alpha; testing gender difference using t-tests for independent samples.
* p < .05. ** p < .01. *** p < .001.

control, contains all items of the coping with failure scale and two impulse control items. Factors 5 and 6, labelled initiating control and forgetfulness prevention, respectively, contain items from the respective original scales (see Table 5).

Confirmatory Factor Analyses

Four models for the VCQ-36 were tested: (1) a 12-factor model with the 12 original VCQ-36 scales (Table 2); (2) a 6-

Table 4. VCQ-36 Scale Means for Subsamples with ICD-10 Mental and Behavioural Disorders (N = 1018)

Diagnosis	n (%)	At	Mo	Em	Ac	Re	De	Co	Go	Fo	Pl	Im	In
F10 Mental and behavioural disorders due to use of alcohol	32 (3.1)	4.3	3.0	2.7	3.4	2.0	4.4	5.2	5.0	5.0*	4.9	4.3	4.5
F17 Mental and behavioural disorders due to use of tobacco	58 (5.7)	4.6	3.3	3.0*	3.4	2.2	4.6	4.9	4.9	5.3	5.2	4.8	4.6
<i>F32, F33, F34.1</i> Depressive disorders	561 (55.1)	4.1	2.8	2.4	3.3	1.8	4.2	4.9	5.2	5.8	4.9	4.6	4.7
F32 Depressive episode	274 (26.9)	4.1	2.9	2.4	3.3	1.8	4.3	4.9	5.3	5.8	4.9	4.6	4.8
F33 Recurrent depressive disorder	210 (20.6)	4.0	2.7	2.3	3.0	1.8	3.9	4.8	5.2	5.6	4.9	4.5	4.4
F34.1 Dysthymia	88 (8.6)	4.4	3.1	2.8	3.9*	2.0	4.4	5.0	5.2	5.8	4.9	4.7	4.8
<i>F40, F41 Anxiety disorders</i>	222 (21.8)	4.1	2.7	2.4	3.1	1.6	3.9	5.0	5.2	5.4**	4.9	4.7	4.6
F40 Phobic anxiety disorders	135 (13.3)	3.8	2.5**	2.0*	2.8*	1.5**	3.6**	4.8	5.1	5.2**	4.8	4.4	4.4
F41.0 Panic disorder	39 (3.8)	4.8*	2.7	2.6	3.6	1.7	4.4	5.6*	4.9	5.5	5.2	5.1	4.8
F41.1 Generalized anxiety disorder	11 (1.1)	3.2	2.1*	2.0	2.6	1.0*	3.9	4.0	6.4*	6.0	4.5	4.5	4.5
F41.2 Mixed anxiety and depressive disorder	48 (4.7)	4.8**	3.5**	3.2***	3.7	2.2	4.4	5.1	5.4	5.3	5.1	5.1	4.9
F43.1 Post-traumatic stress disorder	31 (3.0)	3.7	2.3*	2.1	2.4*	1.4	3.8	4.9	4.9	5.4	4.4	4.6	4.8
F43.2 Adjustment disorders	201 (19.7)	5.0***	3.5***	3.1***	3.8**	2.4***	5.0***	5.4***	5.5	5.6	5.3*	5.2***	5.6***
F45 Somatoform disorders	149 (14.6)	4.2	3.1	2.6	3.2	2.1	4.4	5.2	5.2	5.4*	4.7	4.9*	5.0
<i>F50 Eating disorders</i>	184 (18.1)	4.2	2.7	2.4	3.3	1.9	4.1	4.7	5.1	5.6	4.5*	3.7***	4.4
F50.0+1 Anorexia nervosa	21 (2.1)	3.6	3.1	1.8	3.2	1.6	3.7	4.9	5.1	5.6	4.0*	4.7	4.6
F50.2+3 Bulimia nervosa	46 (4.5)	4.3	2.5	2.2	2.9	1.5	3.7	4.5	5.6	5.5	4.7	3.5**	4.7
F50.4 Overeating associated with other psychological disturbances	73 (7.2)	4.1	2.5	2.6	3.4	2.0	4.3	4.8	5.0	5.9	4.6	3.6***	4.4
F50.9 Eating disorder, unspecified	45 (4.4)	4.4	2.8	2.6	3.4	2.2	4.4	4.6	4.7	5.1	4.4	3.7**	4.1
F60.3 Emotionally unstable personality disorder	37 (3.6)	3.4	2.0*	2.0	2.8	1.2	3.7	4.1	4.8	5.0	4.0*	4.3	4.2
F62 Enduring personality changes	45 (4.4)	3.6	2.6	2.1	3.3	1.4	3.7	3.8**	4.8	5.8	5.0	4.1	4.4

Notes: At: Attentional focusing. Mo: Self-motivation. Em: Emotion regulation. Ac: Self-activation. Re: Self-relaxation. De: Decision regulation. Co: Coping with failure. Go: Goal recollection. Fo: Forgetfulness prevention. Pl: Planning skill. Im: Impulse control. In: Initiating control.
* $p < .05$. ** $p < .01$. *** $p < .001$. Significant differences of means between the subsamples with the respective diagnosis and the subsample with a depressive disorder (F32, F33, F34.1).

factor model with the 6 factors of the EFA (Table 5); (3) a 2-factor model with the two macrocomponents self-regulation and self-control; and (4) a 1-factor model. All models produced a statistically significant χ^2 value (see Table 6), indicating that the observed and specified models differed. However, this is not uncommon for large samples and does not necessarily reflect a poor fit to the data [50]. Based on the

RMSEA values reported in Table 6, the 12-factor model showed a good fit to the data, the 6-factor model an adequate fit, and the other models an unacceptable fit. Based on the SRMR values, the 12-factor and the 6-factor model showed a good fit to the data, and the other models an adequate fit. The AIC and BIC corroborated the finding that the 12-factor model provided the best fit, followed by the 6-factor model.

Table 5. Varimax Rotated Factor Structure of the VCQ-36

Items	Factors					
	1	2	3	4	5	6
Re2	0.76	0.04	0.14	0.18	-0.01	-0.01
Em1	0.74	0.08	0.12	0.05	0.11	0.07
Re1	0.74	-0.01	0.15	0.15	-0.01	-0.06
Em2	0.73	0.06	0.16	0.03	0.11	-0.05
Em3	0.70	0.07	0.21	0.17	0.11	-0.06
Re3	0.70	0.05	0.09	0.12	-0.03	-0.06
Mo1	0.64	0.18	0.20	0.10	0.17	-0.13
Mo3	0.60	0.13	0.13	-0.01	0.26	0.00
Mo2	0.58	0.19	0.22	0.10	0.31	0.01
Im3	0.46	0.05	0.30	0.28	0.13	-0.10
At1	0.48	0.28	0.37	0.18	0.14	-0.24
Pl1	0.02	0.77	0.19	0.17	-0.04	0.03
Pl2	0.20	0.70	0.21	0.23	0.09	0.07
Pl3	0.14	0.67	0.16	0.18	-0.11	0.13
Go1	0.11	0.58	-0.14	-0.17	0.26	0.20
Go3	0.15	0.58	-0.15	-0.05	0.37	0.12
Go2	0.03	0.57	-0.02	-0.22	0.22	0.31
De2	0.26	-0.08	0.69	0.07	0.18	0.03
De1	0.34	-0.07	0.57	0.20	0.31	0.12
De3	0.33	0.08	0.56	0.24	0.12	0.01
Ac2	0.36	0.28	0.52	-0.22	0.07	-0.33
Ac1	0.36	0.31	0.51	-0.18	0.05	-0.34
At2	0.48	0.13	0.49	0.15	0.25	-0.05
At3	0.33	0.24	0.45	0.20	0.34	-0.07
Ac3	0.38	0.29	0.44	0.01	0.24	-0.24
Co3x	0.15	0.05	0.18	0.72	-0.01	-0.14
Co1x	0.09	0.12	0.15	0.70	0.02	-0.13
Im1x	0.18	-0.02	-0.01	0.61	0.27	0.01
Im2x	0.11	-0.06	-0.15	0.58	0.27	0.05
Co2	0.34	0.25	0.31	0.54	0.05	-0.06
In2	0.13	0.11	0.17	0.16	0.78	-0.09
In1	0.18	0.15	0.28	0.15	0.74	-0.04
In3	0.17	0.09	0.24	0.16	0.70	-0.12
Fo1	0.02	0.31	0.06	-0.07	-0.04	0.74
Fo3	-0.13	0.28	0.02	-0.06	0.04	0.72
Fo2x	-0.07	0.03	-0.13	-0.09	-0.14	0.56
Eigenvalues	6.16	3.35	3.24	2.77	2.74	2.03
% variance explained	17.12	9.30	9.00	7.69	7.60	5.64

Notes: At: Attentional focusing. Mo: Self-motivation. Em: Emotion regulation. Ac: Self-activation. Re: Self-relaxation. De: Decision regulation. Co: Coping with failure. Go: Goal recollection. Fo: Forgetfulness prevention. Pl: Planning skill. Im: Impulse control. In: Initiating control. x: recoded.

Table 6. Confirmatory Factor Analysis of the VCQ-36

Model	χ^2	df	p of χ^2	RMSEA	SRMR	AIC	BIC
1 factor	7244.27	594	< .001	.105	.069	7388.27	7742.91
2 factors (SR, SC)	6660.63	593	< .001	.100	.070	6806.63	7166.20
6 factors (resulting from EFA Table 5)	2319.75	579	< .001	.077	.059	2493.75	2861.97
12 factors (original scales)	1100.93	528	< .001	.046	.041	1376.93	1961.01

Note. SR: self-regulation (attentional focusing, self-motivation, emotion regulation, self-activation, self-relaxation, decision regulation, coping with failure); SC: self-control (goal recollection, forgetfulness prevention, planning skill, impulse control, initiating control).

Relations to External Criteria

Psychopathology

Table 7 presents the zero-order correlations computed to examine the relations of the volitional components to other constructs. Correlations with medium or high effect sizes are printed in bold. For the most part, self-regulation competences correlated negatively with depressive symptoms and total psychiatric symptomatology. Only one self-control competence, namely impulse control, correlated meaningfully with psychopathology. Physical complaints were negatively associated with self-relaxation competence only.

Personality

As expected, self-regulation competences correlated negatively with neuroticism, social inhibitedness, and excitability, and positively with extraversion. Impulse control was also negatively associated with neuroticism and excitability.

All self-regulation competences as well as initiating control correlated positively with achievement orientation.

Cognitive Ability

No meaningful correlation with cognitive ability was observed.

DISCUSSION

The results of the present study lend support to the reliability and validity of the VCQ-36. The internal consistencies of the VCQ-36 scales were satisfactory (Table 3), and the Cronbach’s α coefficients were similar to those obtained by Kuhl and Fuhrmann [27]. The confirmatory factor analyses clearly showed that the VCQ-36 shared several volitional components with the original VCQ. Estimates of the models’ fit to the data suggested that a 12-factor model (i.e., the original 12 scales of the VCQ-36) was preferable to the 6-factor model resulting from our exploratory factor analysis.

Table 7. Relationships of VCQ-36 Scales to Psychopathology, Personality, and Cognitive Ability (N = 1018)

	At	Mo	Em	Ac	Re	De	Co	Go	Fo	Pl	Im	In
Psychopathology												
Depressive symptoms (CES-D)	-.35***	-.34***	-.39***	-.23***	-.39***	-.30***	-.27***	.00	.02	-.11***	-.27***	-.25***
Total psychiatric symptomatology (SCL-9)	-.26***	-.24***	-.28***	-.18***	-.28***	-.29***	-.33***	.05	.06	-.07*	-.32***	-.20***
Physical symptoms – Total (GBB)	-.18***	-.14***	-.18***	-.11***	-.25***	-.17***	-.14***	.05	.05	-.06*	-.14***	-.13***
Personality (FPI)												
Achievement orientation	.45***	.33***	.32***	.48***	.25***	.47***	.24***	.10***	-.12***	.17***	.23***	.33***
Inhibitedness	-.32***	-.33***	-.36***	-.30***	-.29***	-.38***	-.20***	.07*	.05	-.05	-.21***	-.20***
Excitability	-.21***	-.26***	-.31***	-.09**	-.41***	-.25***	-.27***	.13***	.16***	-.07*	-.30***	-.08**
Extraversion	.29***	.26***	.35***	.38***	.24***	.36***	.11***	.02	-.05	-.01	.08*	.18***
Neuroticism	-.31***	-.33***	-.35***	-.16***	-.42***	-.31***	-.32***	.14***	.09**	-.07*	-.32***	-.18***
Cognitive ability (ZVT)												
Cognitive speed	.15***	.02	-.01	.11***	.01	.05	.10**	.05	.05	.02	-.02	.08**

Note. Zero-order correlations. At = attentional focusing, Mo = self-motivation, Em = emotion regulation, Ac = self-activation, Re = self-relaxation, De = decision regulation, Co = coping with failure, Go = goal recollection, Fo = forgetfulness prevention, Pl = planning skill, Im = impulse control, In = initiating control.
* $p < .05$. ** $p < .01$. *** $p < .001$. Medium or high effect sizes ($r \geq \pm .25$) are shown in bold.

A two-factor solution with self-regulation and self-control competences as macrocomponents, as suggested by the theory of self-regulation [7, 8], was too approximate a classification of volition and did not satisfactorily represent the intercorrelations of the VCQ-36. Thus, we propose using the VCQ-36 primarily to measure the 12 volitional microcomponents and not the two macrocomponents. Clearly, researchers and practitioners interested in certain volitional competences can use the corresponding scales separately from the complete instrument [32, 33, 51, 52].

The EFA grouped most of the self-regulation competences into two factors, one combining skills involved in starting an action (decision, activation, and attention regulation), and one combining skills involved in influencing motivation and emotion (motivation, emotion, and relaxation regulation). These two sets of skills may be important in different action phases [12-14, 53]. The preparation phase requires self-control skills such as planning as well as self-regulation skills involved in decision making and initiating action. In the implementation phase, skills are needed that help to maintain motivation and to regulate emotion in order to reach a given goal.

The nomological net established by investigating the relation of the volitional competences with other constructs proved to be fairly meaningful. Most of the self-regulation competences correlated negatively with most of the psychopathological measures, whereas most of the self-control competences did not. This confirms the protective effect of self-regulation on mental and physical health that can be deduced from the theory of self-regulation [7, 8] and previous research using the VCQ [28] and other measures [6, 11, 24, 25]. The most important volitional competences for mental health seem to be attentional focusing, self-motivation, emotion regulation, self-relaxation, decision regulation, coping with failure, and impulse control. The single most significant competence for physical health seems to be the ability for self-relaxation.

Impulse control showed the same correlational pattern as the self-regulation competences, although a different pattern had been expected. Forstmeier and Rüdell [38] found that patients using mainly self-regulation strategies have fewer depressive symptoms and less negative affect than patients using mainly self-control strategies. A core facet of self-control is the suppression of unwanted impulses [9, 14]. Individuals who often suppress internal signals (emotions, needs, physical signs) experience more stress, negative emotions, and physiological activation, which may lead to a series of emotional and physical problems [54, 55]. Two of the three impulse control items relate to resistance to temptation. This formulation is probably too global and does not differentiate very well between self-regulation and self-control. We propose developing some new items that are better capable of capturing the suppression aspect of self-control. It would also be desirable to include the suppression of emotions (e.g., by not expressing them), motivation (e.g., by ignoring competing goals), and attention (e.g., by stopping distracting stimuli). A good example for the measurement of the self-control and self-regulation aspects of emotion regulation is the Emotion Regulation Questionnaire (ERQ) [17]. The self-regulation items of the ERQ focus on cognitive reappraisal (e.g., "When I want to feel less negative emotion, I

change the way I'm thinking about the situation"); the self-control items are targeted at suppression of emotions (e.g., "When I am feeling negative emotions, I make sure not to express them").

The pattern of associations with personality variables confirms previous results obtained with the original VCQ [27]: self-regulation competences play a major role in emotional and social balance, showing negative associations with neuroticism, social inhibitedness, and excitability, and positive associations with extraversion. Although volitional competences were not found to influence performance in a cognitive speed task, as has been shown previously [27], they correlated highly with achievement orientation. This association might be the reason that people high in self-regulation receive higher school grades [11] and have higher occupational performance [33].

The fact that most volitional competences are similarly impaired in most psychiatric disorders implies that volitional disturbance is largely a common characteristic of mental impairment. This supports the findings obtained with the original VCQ [27]. However, there are also disorder-specific volitional impairments. Patients with phobic disorders appear to be highly impaired in self-motivation, emotion regulation, self-activation, self-relaxation, and decision regulation. This might reflect the avoidance symptoms of phobic disorders that hinder patients to effectively implement their chosen goals [29]. Patients with bulimia nervosa or overeating (but not anorexia nervosa) have particularly severe problems with impulse control, which is reflected in their recurrent failure to control impulses to eat. Finally, patients with adjustment disorders appear to be less volitionally impaired than most other subsamples. This is not surprising when considering the criteria of adjustment disorders, which exclude more severe disorders like depressive episode or anxiety disorders.

A number of limitations of the present study should be acknowledged. First, the sample consisted of patients with psychiatric or psychosomatic disorders. Mean values of the scales will probably be lower in a non-clinical sample. It would be desirable to replicate the present findings in a non-clinical sample to establish norms for the VCQ-36 scales. Second, the sample has a high proportion (55%) of depressed patients and is therefore not representative of patients with mental disorders in general. However, as our results and those of others [27, 36] show, volitional competences are similarly impaired in most psychiatric disorders (see above). Third, this study applied a cross-sectional design. A longitudinal design is needed to test the assumption that volitional deficits are the causes of health and social problems. Fourth, no alternative measure of volition was utilized to establish the convergent validity of the VCQ. In another study, however, Forstmeier and Maercker [51] reported high correlations between volitional measures. Finally, this study lacks behavioural measures of volition. However, Kuhl and Fuhrmann [27] and Fröhlich and Kuhl [36] reported significant associations of VCQ-based volitional measures and objective indices of volitional competence.

Taken together, the findings of the present study support the conclusion that volition is composed of several competences, and that the VCQ-36 is a reliable and valid instrument for assessing volitional competence. The VCQ-36

draws a differentiated diagnostic picture of a person's volitional strengths and weaknesses, which might profitably be utilized in psychotherapy or educational/occupational training (e.g., [28, 33]). Other measures of volition offer only a global measure of volitional strength (e.g., ACS, LAQ, SCS) or single volitional competences (e.g., SRS, ERQ). Given that the original VCQ has proven sensitive to change [14], the VCQ-36 is presumably suitable for evaluating changes in volition after psychotherapy or training.

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