



Construction and validation of an Italian dysfunctional beliefs questionnaire

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Abstract

With reference to the rational emotive behavior therapy (REBT) framework model, the purpose of the present study was to develop a multidimensional scale regarding dysfunctional beliefs of young people, and to clarify its factor structure. In line with this purpose, the dysfunctional beliefs questionnaire (DBQ) was developed. It is composed of four subscales measuring self-criticizing, catastrophizing, demandingness and frustration intolerance. Results reveal that the DBQ shows a good four-factor structure that represents the four subscales of the theoretical framework model. Furthermore, this result demonstrates adequate internal consistency reliability and supports the validity of the DBQ in terms of construct convergent (assessed with the personality belief questionnaire) and divergent validity (assessed with intelligence and coping strategies). Findings also show that dysfunctional beliefs are negatively correlated with intelligence and blunting coping and partially correlated with monitoring coping. Clinical implications and the potential utility of examining the combined influence of other cognitive factors are highlighted.

Keywords Dysfunctional beliefs · Coping flexibility · Intelligence · Dysfunctional beliefs questionnaire

Introduction

Core beliefs represent general, strongly-held views about ourselves, others, and the world, influencing the way we react in different circumstances. They are also assumptions which form the basis for situation-specific beliefs (Ellis 1994; Cheie and Miu 2016). Such cognitive structures support and influence the way in which people construct their current experiences and lead to the establishment of new sets of information. Hence, core beliefs can lead to emotional, behavioral

or psychological and physiological outcomes (Ellis 1991, 1994; Froggatt 2005).

According to the rational emotive behavior therapy (REBT) framework model, introduced by Albert Ellis, people have both rational and irrational thoughts (Ellis 1995, 2003). Ellis argued that in rational beliefs, people tend to be relative in their judgments and evaluations; this produces in them positive self-efficacy and adaptability to reality and the environment. In irrational beliefs, individuals tend mostly to have absolute thoughts and judgments which lead to self-defeating behavior and interfere with the survival and well-being of the subject (Dryden 1999; Malhotra and Kaur 2016). Therefore, such thoughts can restrict a person's behavioral repertoire and inhibit actions in general (Sauerland et al. 2015).

The aim of the present paper was to construct a scale to evaluate these irrational beliefs. Most scales in literature such as the dysfunctional attitude scale (DAS, Weissman and Beck 1978), the personality belief questionnaire (PBQ, Beck and Beck 1991) and the irrational belief survey (IBS, Watson et al. 1990) mainly evaluate dysfunctional beliefs in clinical settings. The DAS is one of the most widely used, and discriminates between depressed and non-depressed subjects showing a monodimensional structure (Vézina and Bourque 1984). The PBQ has been adapted in Italian to identify beliefs

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associated with specific personality disorders (Flebus and Montano 2006). This instrument shows nine dimensions: dependent, avoidant, passive-aggressive, obsessive, antisocial, narcissistic, histrionic, schizoid and paranoid. However, the scale is not always reliable in providing non-redundant operational definitions for personality disorders, assuming the presence of a large factor general, of which the authors do not provide the average score obtained from the sample (Flebus and Montano 2006). In the IBS, only four factors related to the content of the 11 assertions of the survey emerged: ‘I need to control’, ‘Self-assertion is painful,’ ‘I need affirmation.’ and ‘I lack control over my fate’.

Our goal is instead to identify a more complete set of dysfunctional beliefs in healthy people, assuming that they may not be so pervasive as to lead to a condition of clinical relevance, but can still influence, in some situations, the behavior of individuals. For this reason, the items used in the construction of our questionnaire reflect common dysfunctional beliefs that may arise in relation to daily events. For example with reference to self-criticizing, while in the IBS it refers only to two sentences, in our instrument it has been formulated involving the overall negative evaluations of oneself as being excessively critical towards oneself, others and the conditions of life. With regard to catastrophizing, the items have been formulated considering the tendency of the individuals to evaluate the situations as absolutely negative. Concerning demandingness, the items were expressed in absolute terms, using ‘must’ and ‘should’ and also including an evaluative component. With regard to frustration intolerance, the items have been formulated considering the tendency of the individuals to believe they cannot stand or are not able to endure a specific situation, and the belief that reality must be as they want it to be.

The REBT approach suggests that irrational beliefs fall into four categories of irrational (dysfunctional/maladaptive) beliefs: demandingness, catastrophizing, global evaluation/self-criticizing, and frustration intolerance (DiGiuseppe 1996; Szentagotai et al. 2005). After the first work in which Ellis mainly used the rational term (Ellis 1995), successively he interchangeably used both terms ‘rational’ and ‘functional’ (2003). They can be described as follows below (Ellis 1994; Ellis and Dryden 2007; Ellis and Ellis 2013).

Catastrophic thinking occurs when an individual expects disaster to strike, no matter what, or imagines the worst possible consequences of failure. For instance, ‘If I don’t achieve my goal, it will be a disaster!’. If something bad happened to you and you then formed a limiting belief instead of trying to fix that problem, you will prevent yourself from solving the problem. Catastrophizing is also referred to as ‘magnifying or minimizing.’ We hear about a problem and use ‘what if’ questions, e.g., ‘What if tragedy strikes?’ ‘What if it happens to me?’

Demands are imperatives which guide the actions of people. For example, ‘I have to conclude my studies, because it is

very important for my parents’ or ‘Others must recognize my merits!’’. We have a list of implicit rules about how others, and we, should behave. People may often believe they are trying to motivate themselves, but they act out of shoulds and shouldn’ts.

Self-criticizing is a distortion where an individual believes that everything others do or say is some kind of direct, personal reaction to the person. Such a belief also refers to global ideas on herself/himself: for instance, people may see themselves as the cause of some negative external event, which in fact they were not primarily responsible for.

Frustration intolerance involves different areas, such as tolerance of fairness, comfort and uncertainty (Dryden 1999). Precisely, people think that they cannot endure, or envision being unable to endure a given situation, or that they will have no happiness at all if what they demand should not exist (Ellis et al. 2010). For example, ‘I cannot tolerate not having the love and approval of the people who are important to me’.

As aforementioned, dysfunctional beliefs organize and guide the individual’s set of information, influencing the way in which people assess an event. Such thoughts affect the functioning of an individual by lowering social, cognitive and emotional skills and performance in the daily life (Filippello et al. 2014; Sorrenti et al. 2015; Malhotra and Kaur 2016).

The second aim of the present paper was to validate the dysfunctional belief scale in a healthy sample. Since dysfunctional beliefs, which are borrowed from the information processing paradigm, can be affected by other cognitive factors, such as coping and intelligence, we considered them in this paper (Ellis et al. 2010; Dimitriu and Negrescu 2015).

Coping and intelligence are both adaptive behaviors. More precisely, coping is defined as the ability to adapt to certain situations and pass from one thought to another, or the capacity of looking at different problems with multilateral strategies (Gunduz 2013): intelligence comprises of the set of abilities involved in dealing with novel environments (Sternberg 2012). It is known that coping emphasizes everyday behavior adaptation, whereas intelligence focuses on thought process adaptation. On the other hand, dysfunctional beliefs may lead to maladaptive behavior, and, for this reason the beliefs can be inversely related to both types of adaptations.

Studies on coping (Schwartz and Daltroy 1999; Cheng 2001, 2003; Schmidt et al. 2002; Watanabe et al. 2002) have shown that individuals differ in the extent of their coping across stressful situations. Some individuals use different types of coping strategies in distinct stressful situations, and the characteristics of coping strategies fit the specific situational demands. Monitoring and blunting are defined as two main psychological coping styles that are predominantly utilized in situations implying threat or danger. Monitoring (attending) describes an information-seeking approach (more flexible), whereas blunting (avoiding) involves the extent to

which individuals distract themselves from such information (Miller 1995). Therefore, it can be assumed that dysfunctional beliefs contribute to negative coping, decreasing resilience to stressful life events. Indeed, the maladaptive coping is more often used by people with a high frequency of irrational beliefs (Stanculete et al. 2015).

While the link between coping and dysfunctional beliefs has been widely investigated, little is known about the relationship among intelligence and irrational thoughts. Intellectual ability may affect the degree to which reasoning is biased; if intellectual ability indexes limitations in computational capacity (Stanovich and West 2000), then those of lower ability should have more difficulty in, for example, monitoring reasoning for consistency and keeping “in mind” both belief-relevant evidence and consistent standards for evaluating evidence. Support for this hypothesis is available for a number of judgment and reasoning tasks (Stanovich and West 1997; Newstead Handley et al. 2004). A limited number of studies in this field have yielded equivocal results. In the studies of Barriga et al. (2001) and Hoogsteder et al. (2014) no relation was found between intelligence and irrational beliefs in adolescents. In opposition to these findings, it was found that intelligence is negatively correlated with reasoning biases (Stanovich and West 1997, 1998; Sá et al. 1999), and that crystallized intelligence (among middle-aged and older adults) is positively correlated with biases (Klaczynski and Robinson 2000). Moreover, moderate correlations between cognitive ability and the capacity to avoid such biases were reported (Gilinsky and Judd 1994; Kokis et al. 2002; Simoneau and Markovits 2003; Handley et al. 2004; Fabio 2009). On the other hand, Nas (2005) found that adolescents with a lower level of intelligence displayed more cognitive distortions compared to adolescents with higher levels of intelligence.

To summarize, there is agreement in literature on the link between unbiased reasoning and thinking dispositions, but there is disagreement on the relationship between cognitive ability and dysfunctional beliefs. In addition, only few studies have investigated these correlations in healthy young people. For these reasons, the main aim of the present study was to develop a multidimensional scale regarding the dysfunctional beliefs of young people, and to clarify its factor structure. In line with this purpose, the Dysfunctional Beliefs Questionnaire (DBQ) was developed. In order to examine the convergent validity, the PBQ (Beck and Beck 1991) was used. To examine the divergent validity, the Extended Miller Behavior Style Scale (EMBSS; Cheng 2001) and the Culture Fair Intelligence Test (CFIT; Cattell 1973) were employed. More precisely, we hypothesized:

- a) Dysfunctional beliefs may be positively correlated with PBQ;
- b) Dysfunctional beliefs may be negatively correlated with avoidance coping (blunting) and positively correlated with adaptive coping (monitoring);
- c) Dysfunctional beliefs may be negatively correlated with intelligence.

Methods

Participants

Four hundred and three subjects, 180 males (44.8%) and 223 females (55.3%) participated in this study. They were recruited from a secondary high school in Sicily (Italy). The mean age was 18.05 years. All participants were Italian and spoke Italian. Also, each subject voluntarily agreed to participate in this research study, and, after providing informed consent, they were tested individually in a quiet room of the school.

Scale Development

The scale was developed in accordance with developments in CBT/REBT (DiGiuseppe 1996; Szentagotai et al. 2005). The items were designed to reflect the four irrational beliefs (self-criticizing, catastrophizing, demandingness and frustration intolerance) based on irrational phrasing (Alford and Beck 1997; De Silvestri 1999; Dobson 2002; Kassino et al. 1977). In order to adequately investigate the underlying factorial structure and satisfy the validity of content, the most relevant aspects of each irrational belief were taken into consideration in the formulation of the items. Thus, for the formulation of the items concerning self-criticizing, sentences were formulated involving the overall negative evaluations of oneself, that is, the tendency of the people to be excessively critical towards oneself, others and conditions of life (i.e. “*I got a prize*” but anyone could have gotten it”). With regard to catastrophizing, the items were formulated considering the tendency of the individuals to evaluate the situations as absolutely negative (i.e. “*It is terrible that nothing positive ever happens to me*”). Concerning demandingness, the items were expressed in absolute terms, using “must” and “should” and also including an evaluative component (i.e. “*I should always get what I want*”; “*I must get maximum results in my activities, otherwise I’m a failure*”). With regard to frustration intolerance, the items were formulated considering the tendency of the individuals to believe they cannot stand or are not able to endure a specific situation, and the belief that reality must be as they want it to be (i.e. “*I cannot tolerate not having the approval and love of the people I deem important*”).

Therefore, 40 items were formulated to form the *Dysfunctional Beliefs Questionnaire* (DBQ). Content validity of the scale was reviewed by three cognitive-behavioral

experts who have expressed their independent judgment about the appropriateness of each item and the completeness of the domain coverage.

Reverse-scored items were not used to not confuse subjects. Barnette (2000) suggests that reverse items may be difficult for individuals who have a low socio-cultural level, are teenagers or have cognitive difficulties.

Measures

Dysfunctional Beliefs Questionnaire (DBQ)

The DBQ was used to investigate dysfunctional thinking. The initial version of the self-report constituted of 40 items that designated the four dysfunctional beliefs (self-criticizing, catastrophizing, demandingness and frustration intolerance). Each of the items was rated in a 5-point Likert scale (0 = I don't believe it at all; 4 = I believe it totally). The sum of each score item in each subscale and the total scale were the DBQ measure.

Dysfunctional Thinking Questionnaire

The PBQ (Beck and Beck 1991; Beck and Freeman 1990) was developed as a clinical and research instrument, designed to assess dysfunctional beliefs associated with personality disorders of Axis II of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV American Psychiatric Association, APA 2000). Despite the shift to DSM-V (APA 2013), it consolidates the literature on the PBQ to provide a summary of the psychometric status, revisions and applications of the PBQ scales as an instrument that is relevant and useful for identifying dysfunctional beliefs in individuals with personality disorders (Bhar Beck & Butler 2012).

The central idea of the questionnaire is based on the assumption that the descriptive differences of personality disorders may be based on different patterns of beliefs as much as they are perceived in different clinical symptoms (Beck 1991; Beck 2005).

The PBQ evaluates the dysfunctional beliefs hypothesized to underlie the personality disorders that were officially recognized at the time. The PBQ consists of 14 beliefs. Subjects are asked to rate how much they believe a statement on a 5-point Likert-type scale (0 = "I don't believe it at all"; 4 = "I believe it totally"). The internal consistency (Cronbach's α) of the total scale is 0.87. The test-retest reliability in a large, outpatient psychiatric sample, and many of the subscales have differentiated patients diagnosed with different personality disorders (Beck et al. 2001).

Several studies have been conducted to evaluate the validity of the PBQ (Beck et al. 2001; Butler et al. 2002; Butler et

al. 2007; Fydrich et al. 1996; Fournier et al. 2012; Nelson-Gray et al. 2004; Trull et al. 1993). These studies found favorable internal consistency and test-retest reliability for the PBQ.

Intellectual Ability Questionnaire

The CFIT (Cattell 1973) was designed to assess intelligence (or other attributes) without relying on knowledge specific to any individual cultural group. It is a nonverbal instrument to measure analytical and reasoning ability in abstract and novel situations. The test includes mazes, classifications, conditions and series. Such problems are believed to be common in all cultures. The CFIT involves three scales. The first is used for children (4–8 years) and people with mental retardation. Other scales are used for adults. Scales 2 and 3 contain two equivalent forms, A and B, with the following features. Each form can be administered individually or in combination with the other form. When it is administered individually, it is called a short intelligence test. However, when both forms of a scale are combined, it is called a full-scale test. Each form is comprised of four sub-tests: series, classifications, matrices and conditions. Each sub-test is preceded by several practice questions. In the present study, scale 2, form A was employed.

Coping Questionnaire

To assess coping flexibility, EMBSS (Cheng et al. 2001) was used. The EMBSS involves eight hypothetical stressful situations, each of which is followed by eight coping options: four monitoring and four blunting strategies. Participants have to decide whether they would employ a specific strategy in handling each of the situations. The EMBSS has adequate internal consistency ($\alpha = .84$ for the monitoring subscale and $\alpha = .75$ for the blunting subscale).

Procedure

Participants performed EMBASS, DBQ, PBQ and CFIT in their respective classrooms during timetable hours. Participants were asked to complete the tests as honestly and completely as possible. Instructions were given in both verbal and written form. Each session lasted approximately 30 min.

Data Analysis

IBM SPSS.19 was used to carry out the Explorative Factor Analysis (EFA), descriptive statistics, Cronbach's Alpha and correlations.

Results

Descriptive Analyses

Table 1 shows means, standard deviations, skewness and kurtosis for all the items of the DBQ. Descriptive analysis showed that all items have adequate scores of symmetry and kurtosis (symmetry from -2 to $+2$, and kurtosis of from -7 to $+7$; West et al. 1995).

Table 1. Means, standard deviations, skewness and kurtosis for all the items of the DBQ.

Exploratory Factor Analysis

To verify the factorial structure of the DBQ, Principal Axis Factoring was carried out with rotation (promax with Kaiser normalization) on the 40 items. Bartlett's test of sphericity 5308.117; $p < .001$) and the Kaiser-Meyer–Olkin (.88) indicated the use of these data in a factor analysis. The number of factors was determined through Velicer's minimum average partial (MAP) test (Velicer 1976; Velicer et al. 2000), scree test and factors with eigenvalues greater than 1. An iterative process was used in which items with relatively low primary loadings ($< .30$) or cross-loading of .30 (no secondary loading above .30), were removed. The Original MAP test (Velicer 1976), the Revised MAP test (Velicer et al. 2000) and scree test suggested 4 factors. Hence, a four-factor analysis was performed. Analysis of the eigenvalues showed four factors with eigenvalues greater than 1 that explain 39% of the variance. The first factor shows an eigenvalue of 9.39 representing a variance of 23.47%; the second factor shows an eigenvalue of 2.59, representing a variance of 6.48%; the third factor shows eigenvalue of 1.91, representing a variance of 4.78%; the fourth factor shows an eigenvalue of 1.81, representing a variance of 4.52%. Two items (30 and 40) failed this test because they had a loading lower than .30 on one of the four identified factors or cross-loading on more factors. We once again conducted factor analyses excluding the above items; however, items 16 and 25 failed this test because they did not meet the inclusion criteria of the items. Hence, thirty-six items met our criteria, and these comprised four subscales, with twelve items on the first scale (representing self-criticizing), nine items on the second (representing catastrophizing), nine items on the third (representing demandingness) and six items on the fourth (representing frustration intolerance). To ensure consistency in item loadings, we once again conducted factor analyses. Thus, we included only 36 items, and used previous criteria with the 4-factor model confirming that the scale retained its structure. These factors explained 40% of total variance (eigenvalues: 1st factor = 8.48; 2nd factor = 2.41; 3rd factor = 1.86; 4th factor = 1.76). The 36 items loaded onto their respective factors at .30 or above and did not cross-load (Table 2). Ultimately, DBQ is made up of 36 items divided

into four subscales. Items 17, 18, 28, 32, 29, 31, 23, 8, 5, 4, 38, and 3 constituted the self-criticizing subscale, items 35, 20, 6, 33, 21, 2, 37, 36 and 7 constituted the catastrophizing subscale, items 27, 22, 26, 24, 1, 15, 39, 34, and 19 constituted the demandingness subscale, while items 13, 9, 14, 12, 11 and 10 constituted the frustration intolerance subscale.

Descriptive Statistics, Internal Reliability and Correlations

Internal consistency analyses were carried out for the final 36 items of the DBQ. The internal reliability of the DBQ full scale was .90. The internal consistency of the subscales was .82 for self-criticizing, .83 for catastrophizing, .77 for demandingness and .66 for frustration intolerance.

Means, standard deviation, skewness, kurtosis, and Cronbach's alpha of the subscales of the DBQ and the other measures (PBQ, monitoring coping, blunting coping and intelligence) are indicated in Table 3. Descriptive analysis showed that all scales have acceptable symmetry and kurtosis values (Table 3). Symmetry and kurtosis values for blunting coping were higher than absolute values of 1. However, according to West et al. (1995), skewness and kurtosis absolute values of 0–2, and 0–7, respectively, can be taken as demonstrating sufficient univariate normality.

Furthermore, in order to examine the convergent and divergent validity of the DBQ, we proceeded with Pearson correlations between the measures (Table 4). Intercorrelations among the DBQ subscales were moderate (range: .43–.62). The DBQ full scale score had a very high correlation with the individual subscales (range: .66–.84). Correlations between DBQ subscales and the other measures show that self-criticizing was positively correlated with PBQ and blunting coping, while it was negatively correlated with monitoring coping and intelligence. Catastrophizing and demandingness were positively correlated with PBQ and blunting coping, while they were negatively correlated with intelligence. Frustration Intolerance was positively correlated with PBQ and blunting coping.

Discussion

The purpose of the present study was to develop a multidimensional scale on dysfunctional beliefs and to clarify its factor structure. To verify the factor structure, an EFA was conducted. Consistent with the REBT theory (Ellis 1994; Ellis and Dryden 2007; Ellis and Ellis 2013), the DBQ is made up of 36 items divided into four subscales: self-criticizing, catastrophizing, demandingness and frustration intolerance. The internal consistency of the total scale is .90, while the four factors show an acceptable reliability, with values between .65 and .83. Many authors (e.g., Cortina 1993; DeVellis 2003;

Table 1 Means (M), standard deviations (SD), skewness and kurtosis for all the items of the DBQ

Items	M	SD	skew	kurt
1. I must get maximum results in my activities, otherwise I'm a failure.	1.35	1.10	.49	-.56
2. It is terrible to think that everything will go bad.	1.52	1.05	.42	-.40
3. If they treat me badly, it's because I'm worth nothing.	.81	1.04	1.40	1.45
4. If my parents do not approve of what I do, they will think I am incapable.	1.44	1.04	.38	-.40
5. I will never be able to learn how to dance, it is impossible for me.	1.03	1.24	1.06	.09
6. It's terrible to be tied to a party.	1.17	1.03	.85	.42
7. It is a catastrophe if a friend does not accept an invitation to go out.	1.07	1.04	1.03	.70
8. In a recent activity I performed well, but anybody could have done the same.	1.44	1.01	.49	-.10
9. If a friend I see on the street does not greet me, I cannot stand the idea that he wants to avoid me.	1.89	1.09	.24	-.48
10. I did not have what I wanted, so I cannot bear the fact that I have disappointed the people who are important to me.	1.71	1.04	.28	-.32
11. I cannot tolerate not having the approval and love of the people I deem important.	2.43	1.12	-.42	-.45
12. While speaking in public I stumbled twice, I cannot endure the idea of having made a bad impression.	1.22	1.02	.61	-.17
13. My colleague/friend did not invite me to her/his party, I cannot endure the idea of being disliked.	1.82	1.04	.07	-.66
14. My friend made an inappropriate joke, I cannot stand it.	2.19	1.11	-.06	-.63
15. Things that happen to me must go the way I want them to go.	1.47	1.20	.53	-.61
16. I was late to work/school, others will think I am irresponsible.	1.71	.96	.23	-.05
17. I got a prize but anyone could have gotten it.	1.26	1.01	.71	.21
18. If I did a good job, it's just because I was lucky.	1.06	1.00	.92	.54
19. If a person attends a party, she/he should not stay aloof.	1.25	1.10	.79	.04
20. I'm always unlucky, and this is a catastrophe for me.	1.45	1.20	.52	-.59
21. It's terrible not to be perfectly fit.	1.46	1.15	.48	-.51
22. I should always get what I want.	2.01	1.20	.06	-.81
23. Nothing I do really matters.	.95	1.07	1.06	.42
24. I have to reach my goals.	1.35	1.10	.56	-.35
25. If a past relationship went wrong, it is my fault.	1.33	1.09	.63	-.12
26. As I speak, my interlocutor should not interrupt me.	1.68	1.19	.40	-.66
27. Others must acknowledge my merits.	2.18	1.05	.00	-.52
28. I won an important race, but anyone could have won it.	1.13	1.07	.86	.22
29. I could not reach my goal, I'm a failure.	1.04	1.14	1.05	.57
30. I have to discuss a school/work relationship, I feel it will go wrong.	1.34	.99	.69	.18
31. I'm nice to most people I know, but that does not matter much.	1.34	1.04	.57	-.12
32. I have to keep evaluating my competencies, I will never measure up.	1.02	.96	.89	.47
33. It's terrible to think that a friend who pays me a compliment does it just out of kindness.	1.13	1.00	.75	.07
34. If someone loves me, they should not treat me badly.	1.79	1.18	.08	-.78
35. It is terrible that nothing positive ever happens to me.	1.02	1.11	.95	.12
36. It is a disaster not to complete a task.	1.60	1.00	.14	-.32
37. It is a disaster not to get good results.	1.17	1.02	.74	.12
38. If my team lost, it was because of me.	1.01	.99	.82	.07
39. I must always be capable and competent to be considered worthy of value.	1.91	1.06	-.08	-.47
40. If they are true friends, they will never refuse to do me a favor.	2.13	1.15	-.12	-.78

Nunnally and Bernstein 1994; Vaske 2008) have suggested that alpha values between .65 to .80 are acceptable in human dimensions research (Vaske 2008; Vaske et al. 2017). Also the correlation between the four factors demonstrates that they are positively correlated. The convergent validity of the instrument was established through its relationship with another measure of dysfunctional beliefs, namely the PQB (Beck

and Beck 1991), indicating a positive relationship between the four subscales of DBQ and PBQ full scale.

The concurrent validity estimates of the instrument were explored by the correlations with intelligence, monitoring coping and blunting coping. The results indicated a weak negative correlation between dysfunctional beliefs and intelligence. These findings are consistent with studies that found

Table 2 Definitive principal axis factoring

	Factor			
	Global evaluation/ Self-downing	Awfulizing/ catastrophizing	Demandndigness	Frustration intolerance
Item 17	.65	-.10	-.10	.18
Item 18	.65	.03	.04	-.21
Item 28	.55	.07	-.05	-.06
Item 32	.52	.18	-.05	.05
Item 29	.51	.08	.18	.04
Item 31	.50	-.16	.14	-.09
Item 23	.49	.05	.09	-.07
Item 8	.46	-.06	-.14	.17
Item 5	.36	-.01	-.15	.18
Item 4	.35	-.02	.19	.18
Item 38	.32	.25	.04	-.06
Item 3	.31	.25	.10	.08
Item 35	.05	.77	-.06	-.22
Item 20	-.14	.77	-.02	-.04
Item 6	.06	.56	-.28	.21
Item 33	.02	.56	.10	-.07
Item 21	-.05	.53	.14	.04
Item 2	-.08	.52	.29	.10
Item 37	.25	.42	.11	-.07
Item 36	.13	.40	-.06	.12
Item 7	.23	.35	-.13	.23
Item 27	-.19	-.08	.64	.12
Item 22	-.20	-.03	.59	.05
Item 26	.19	-.21	.56	.05
Item 24	.17	-.01	.50	.06
Item 1	.13	.06	.49	.06
Item 15	.07	.08	.48	-.18
Item 39	-.02	.11	.43	.20
Item 34	.02	.05	.38	.04
Item 19	.07	.14	.35	-.12
Item 13	.11	-.19	-.06	.73
Item 9	-.25	.22	.09	.53
Item 14	.03	-.14	.18	.40
Item 12	.20	-.01	.01	.38
Item 11	-.10	.04	.21	.35
Item 10	-.02	.28	.00	.34

a negative relationship between the constructs (Stanovich and West 1997, 1998; Sá et al. 1999; Nas 2005). Considering that the CFIT is a measure of fluid intelligence, defined as the capacity of solving new problems, it is possible that, in the face of a new task, the presence of dysfunctional beliefs adversely affects the thinking skills of young adolescents, thus obfuscating the processing of information relevant to the resolution of the task (Hoogsteder et al. 2014). However, it is necessary to consider that the statistical significance may be due to the large sample size. For this reason, it is necessary to

be cautious and future research should deepen the relationship between intelligence and dysfunctional beliefs.

Furthermore, an expected positive relationship was found between dysfunctional beliefs and the EMBSS blunting subscale, a kind of avoidant coping. Specifically, moderate relationships have been found between self-criticizing, catastrophizing, DBQ full scale and blunting coping, while the relationships between demandingness, frustration intolerance and blunting coping are weak. These results would seem to indicate that subjects with dysfunctional beliefs show a

Table 3 Reliability, Means (M), standard deviations (SD), skewness, and kurtosis

	α	M	SD	Skew	Kurt
Global evaluation/Self-downing	.82	13.53	7.28	.75	.24
Awfulizing/catastrophizing	.83	11.60	6.26	.47	-.23
Demandingness	.77	15.02	6.01	.09	-.45
Frustration intolerance	.66	11.26	3.89	.11	-.11
DBQ full scale	.90	51.40	18.35	.27	-.09
PBQ full scale	.95	233.69	62.19	.08	-.14
Monitoring coping	.75	85.95	10.96	-.36	.52
Blunting coping	.78	55.57	11.00	1.40	2.63
Intelligence	.79	31.02	5.74	-.54	.13

tendency to divert attention by turning away from threat-related information. They are characterized by a weak ability to differentiate among distinct stressful events and to apply an integrative strategy to handle different stressors. Blunting or turning away from threat-related information is useful in pacifying anxiety in times of stress (Muris et al. 1994; Schwartz et al. 1995). However, the prevalent use of a negative coping strategy can make persons more vulnerable to stress (Carver et al. 1993; Derogatis et al. 1979; Cheng and Cheung 2005).

On the other hand, a weak negative correlation was found between self-criticizing and the EMBSS monitoring subscale, a kind of adaptive coping approach that refers to the propensity of focusing one’s attention on threat-related information. No significant correlation was found between catastrophizing, demandingness and frustration intolerance and the EMBSS monitoring subscale. This result may depend on the non-clinical sample. In fact, in a non-clinical sample, dysfunctional thoughts may not be so pervasive as to limit access to adaptive coping strategies. Despite this, our results are consistent with the REBT model, as this theory assumes that irrational beliefs facilitate maladaptive coping strategies (Fabio & Buzzai, Comparing gifted and non-gifted adults in creativity, emotional intelligence and cognitive coping strategies (unpublished); Stanculete et al. 2015).

Therefore, an appreciation of the development and the active role of individuals’ beliefs and processes underlying how individuals interact with the environment is important. For this reason, investigating cognitive variables that may be related to individual differences in dysfunctional thinking is critical. Future research should aim at developing a broader measure of belief that encompasses much wider, and much more diverse forms of dysfunctional beliefs. Finally, further testing of the conceptual framework is needed to understand more clearly how cognitive sources are related to dysfunctional beliefs in terms of cognitive flexibility. Therefore, the hypothesis that intellectual ability could affect the degree to which reasoning is biased is quite plausible, as shown in this research. Further findings for this hypothesis are available for a number of judgment and reasoning tasks (Stanovich and West 1997; Newstead et al. 2004).

Apart from individual differences that may be enhanced by the present test, it is also important to explore the process of underlying flexibility, i.e. how individuals formulate flexible or inflexible coping strategies across situations. Cognitive theories propose that the same event can be perceived by different individuals in distinct ways, and the individual’s subjective perception of the environment plays a significant role in influencing their behavior. Evaluation of an individual’s

Table 4 Correlation among measures

	1	2	3	4	5	6	7	8	9
1 Global evaluation/Self-downing									
2 Awfulizing/catastrophizing	.62**								
3 Demandndigness	.43**	.45**							
4 Frustration intolerance	.43**	.46**	.37**						
5 DBQ full scale	.84**	.84**	.73**	.66**					
6 PBQ full scale	.45**	.49**	.62**	.37**	.63**				
7 Monitoring coping	-.12*	-.02	.10	.08	.00	.09			
8 Blunting coping	.36**	.31**	.21**	.14**	.35**	.28**	-.01		
9 Intelligence	-.11*	-.14**	-.17**	-.09	-.17**	-.28**	.12*	-.33**	

N = 400; **p < .001, *p < .05

beliefs, choices and ways of judging oneself, others and one's environment is the key to understanding the reasons and ways of human behavior (Ellis 1994; Cheie and Miu 2016).

The main limit of this study was the sample of students. The instrument should be administered to a larger and heterogeneous sample to confirm the factorial structure of the DBQ, to verify instrument reliability and obtain normative data. Furthermore, it may be important to monitor the evolution of dysfunctional beliefs during adolescence.

In conclusion, the results of this research show that the DBQ has acceptable preliminary psychometric characteristics.

Although preliminary analyses have shown that the DBQ could have an adequate factor structure and reliability, this is only the first phase of the validation process. Future research should replicate these results, verify discriminant validity using other psychological and personological variables, and proceed with further analysis.

In terms of clinical implications, this study suggests that adolescents could learn to be more flexible in implementing coping strategies through cognitive behavioral methods, focusing on the identification of dysfunctional beliefs and the development of functional beliefs.

Compliance with Ethical Standards

Conflicts of Interest The authors declare no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

References

- Alford, B. A., & Beck, A. T. (1997). *The integrative power of cognitive therapy*. New York: Guilford.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Barnette, J. (2000). Effects of stem and Likert response option reversals on survey internal consistency: If you feel the need, there is a better alternative to using those negatively worded stems. *Educational and Psychological Measurement*, 60(3), 361–370.
- Barriga, A. Q., Gibbs, J. C., Potter, G. B., & Liau, A. K. (2001). *How I think (HIT) questionnaire manual*. Illinois: Research Press.
- Beck, A. T. (1991). Cognitive therapy: A 30-year retrospective. *American Psychologist*, 46(4), 368–375.
- Beck, A. T. (2005). The current state of cognitive therapy: A 40-year retrospective. *Archives of General Psychiatry*, 62(9), 953–959.
- Beck, A. T., & Beck, J. S. (1991). *The personality belief questionnaire. Unpublished assessment instrument*. Bala Cynwyd, PA: The Beck Institute for Cognitive Therapy and Research.
- Beck, A. T. & Freeman, A. (1990). *Cognitive therapy of personality disorders*. New York: Guilford press. Trad. It. *Terapia cognitiva Dei disturbi di personalità*. Milano, Firenze, Napoli: Mediserve, 1993.
- Beck, A. T., Butler, A. C., Brown, G. K., Dahlsgaard, K. K., Newman, C. F., & Beck, J. S. (2001). Dysfunctional beliefs discriminate personality disorders. *Behaviour Research and Therapy*, 39(10), 1213–1225.
- Butler, A. C., Brown, G. K., Beck, A. T., & Grishman, J. R. (2002). Assessment of dysfunctional beliefs in borderline personality disorder. *Behaviour Research and Therapy*, 40, 1231–1240.
- Butler, A. C., Beck, A. T., & Cohen, L. H. (2007). The personality belief questionnaire-short form: Development and preliminary findings. *Cognitive Therapy Research*, 31, 357–370.
- Carver, C. S., Pozo, C., Harris, S. D., & Noriega, V. (1993). How coping mediates the effect of optimism on distress: A study of women with early stage breast cancer. *Journal of Personality and Social Psychology*, 65, 375–390.
- Cattell, R. B. (1973). *Culture-fair intelligence test*. Institute for personality and ability testing.
- Cheie, L., & Miu, A. C. (2016). Functional and dysfunctional beliefs in relation to adolescent health-related quality of life. *Personality and Individual Differences*, 97, 173–177.
- Cheng, C. (2001). Assessing coping flexibility in real-life and laboratory settings: A multimethod approach. *Journal of Personality and Social Psychology*, 80(5), 814–833.
- Cheng, C. (2003). Cognitive and motivational processes underlying coping flexibility: A dual-process model. *Journal of Personality and Social Psychology*, 84(2), 425–438.
- Cheng, C., & Cheung, M. W. (2005). Cognitive processes underlying coping flexibility: Differentiation and integration. *Journal of Personality*, 73(4), 859–886.
- Cheng, C., Chiu, C., Hong, Y., & Cheung, J. S. (2001). Discriminative facility and its role in the perceived quality of interactional experiences. *Journal of Personality*, 69, 765–786.
- Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and application. *Journal of Applied Psychology*, 78, 98–104.
- De Silvestri, C. (1999). *Il mestiere di psicoterapeuta*. Roma: Astrolabio.
- Derogatis, L. R., Abeloff, M. D., & Melisaratos, N. (1979). Psychological coping mechanisms and survival time in metastatic breast cancer. *Journal of the American Medical Association*, 242, 1504–1508.
- DeVellis, R. (2003). *Scale development: Theory and applications: Theory and application*. Thousand Okas, CA: Sage.
- DiGiuseppe, R. (1996). The nature of irrational and rational beliefs: Progress in rational emotive behavior theory. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, 4, 5–28.
- Dimitriu, O., & Negrescu, M. (2015). Emotional intelligence and the tendency to use dysfunctional cognitive schemas. *Procedia-Social and Behavioral Sciences*, 187, 301–306.
- Dobson, K. (2002). *Psicoterapia cognitivo comportamentale*. Milano: McGraw Hill.
- Dryden, W. (1999). *Rational emotive behavior therapy: A training manual*. Springer Publishing Company.
- Ellis, A. (1991). The revised ABC's of rational-emotive therapy (RET). *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 9(3), 139–172.
- Ellis, A. (1994). *Reason and emotion in psychotherapy*. NY: A Birch Lane Press Book.
- Ellis, A. (1995). Thinking processes involved in irrational beliefs and their disturbed consequences. *Journal of Cognitive Psychotherapy*, 9(2), 105–116.
- Ellis, A. (2003). Cognitive restructuring of the disputing of irrational beliefs. *Cognitive behavior therapy: Applying empirically supported techniques in your practice*, 79–83.
- Ellis, A., & Dryden, W. (2007). *The practice of rational emotive behavior therapy*. Springer publishing company.

- Ellis, A., & Ellis, D. (2013). Rational emotive behavior therapy. *Current psychotherapies*, 151.
- Ellis, A., David, D., & Lynn, S. J. (2010). Rational and irrational beliefs: A historical and conceptual perspective. *Rational and irrational beliefs: Research, theory, and clinical practice*, 3–22.
- Fabio, R. A. (2009). Relationship between automatic and controlled processes of attention and leading to complex thinking. New York, Nova science publishers, Inc. accession number: WOS: 000273473000008. ISBN:978-1-60741-810-8.
- Filippello, P., Harrington, N., Buzzai, C., Sorrenti, L., & Costa, S. (2014). The relationship between frustration intolerance, unhealthy emotions, and assertive behaviour in Italian students. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 32(4), 257–278.
- Flebus, G. B., & Montano, A. (2006). Presentazione della versione italiana del Personal Beliefs Questionnaire di Beck e Freeman. *Psicoterapia Cognitiva e Comportamentale*, 12(2), 181–195.
- Fournier, J. C., De Rubeis, R. J., & Beck, A. T. (2012). Dysfunctional cognitions in personality pathology: The structure and validity of the personality belief questionnaire. *Psychological Medicine*, 42(04), 795–805.
- Froggatt, W. (2005). *A brief introduction to rational emotive behaviour therapy* (3rd ed.). New Zealand, Stortford Lodge: Hastings.
- Fydrich, T., Schmitz, B., Hennch, Ch. & Bodem, M. (1996). Zuverlässigkeit und Gültigkeit diagnostischer Verfahren zur Erfassung von Persönlichkeitsstörungen. In: Fydrich, T., Schmitz, B. and Limbarger, K., Editors, 1996. Persönlichkeitsstörungen: Diagnostik und Psychotherapie, Beltz, Weinheim, pp. 91–116.
- Gilinsky, A. S., & Judd, B. B. (1994). Working memory and bias in reasoning across the life span. *Psychology and Aging*, 9(3), 356–371.
- Gunduz, B. (2013). Emotional intelligence, cognitive flexibility and psychological symptoms in pre-service teachers. *Educational Research and Reviews*, 8(13), 1048–1056.
- Handley, S. J., Capon, A., Beveridge, M., Dennis, I., & Evans, J. S. B. (2004). Working memory, inhibitory control and the development of children's reasoning. *Thinking & Reasoning*, 10(2), 175–195.
- Hoogsteder, L. M., Wissink, I. B., Stams, G. J. J., van Horn, J. E., & Hendriks, J. (2014). A validation study of the brief irrational thoughts inventory. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 32(3), 216–232.
- Kassinove, H., Crisci, R., & Tiegerman, S. (1977). Developmental trends in rational thinking: Implications for rational-emotive, school mental health programs. *Journal of Community Psychology*, 5(3), 266–274.
- Klaczynski, P. A., & Robinson, B. (2000). Personal theories, intellectual ability, and epistemological beliefs: Adult age differences in everyday reasoning biases. *Psychology and Aging*, 15(3), 400–416.
- Kokis, J. V., Macpherson, R., Toplak, M. E., West, R. F., & Stanovich, K. E. (2002). Heuristic and analytic processing: Age trends and associations with cognitive ability and cognitive styles. *Journal of Experimental Child Psychology*, 83(1), 26–52.
- Malhotra, N., & Kaur, R. (2016). Examining the relationship of irrational beliefs with social-emotional skills. *Indian Journal of Health and Wellbeing*, 7(7), 714.
- Miller, S. M. (1995). Monitoring versus blunting styles of coping with cancer influence the information patients want and need about their disease. Implications for cancer screening and management. *Cancer*, 76(2), 167–177.
- Muris, P., De Jong, P. J., Merckelbach, H., & van Zuuren, F. J. (1994). Effects of imposed monitoring and blunting strategies on emotional reactivity. *Anxiety, Stress & Coping*, 7, 53–65.
- Nas, C. (2005). *'EQUIPPing' delinquent male adolescents to think pro-socially*. Academisch proefschrift: Universiteit Utrecht.
- Nelson-Gray, R. O., Huprich, S. K., Kissling, G. E., & Ketchum, K. (2004). A preliminary examination of Beck's cognitive theory of personality disorders in undergraduate analogues. *Personality and Individual Differences*, 36, 219–233.
- Newstead, S. E., Handley, S. J., Harley, C., Wright, H., & Farrelly, D. (2004). Individual differences in deductive reasoning. *Quarterly Journal of Experimental Psychology Section A*, 57(1), 33–60.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGrawHill, Inc..
- Sá, W. C., West, R. F., & Stanovich, K. E. (1999). The domain specificity and generality of belief bias: Searching for a generalizable critical thinking skill. *Journal of Educational Psychology*, 91(3), 497–510.
- Sauerland, M., Soyeaux, H. M., & Krajewski, J. (2015). The influence of dysfunctional cognitions on job-related experiences and behaviour - a cognitive-behavioural perspective. *International Journal of Human Resources Development and Management*, 15(1), 40–50.
- Schmidt, S., Nachtigall, C., Wuethrich-Martone, O., & Strauss, B. (2002). Attachment and coping with chronic disease. *Journal of Psychosomatic Research*, 53(3), 763–773.
- Schwartz, C. E., & Daltroy, L. H. (1999). Learning from unreliability: The importance of inconsistency in coping dynamics. *Social Science & Medicine*, 48(5), 619–631.
- Schwartz, M. D., Lerman, C., Miller, S. M., & Daly, M. (1995). Coping disposition, perceived risk, and psychological distress among women at increase risk for ovarian cancer. *Health Psychology*, 14, 232–235.
- Simoneau, M., & Markovits, H. (2003). Reasoning with premises that are not empirically true: Evidence for the role of inhibition and retrieval. *Developmental Psychology*, 39(6), 964–975.
- Sorrenti, L., Filippello, P., Buzzai, C., & Costa, S. (2015). Tolleranza alla frustrazione e benessere psicologico: Quale relazione?. *Psicologia della salute*.
- Stanculete, M. F., Matu, S., Pojoga, C., & Dumitrascu, D. L. (2015). Coping strategies and irrational beliefs as mediators of the health-related quality of life impairments in irritable bowel syndrome. *Journal of Gastrointestinal and Liver Diseases*, 24(2), 159–164.
- Stanovich, K. E., & West, R. F. (1997). Reasoning independently of prior belief and individual differences in actively open-minded thinking. *Journal of Educational Psychology*, 89(2), 342–357.
- Stanovich, K. E., & West, R. F. (1998). Individual differences in rational thought. *Journal of Experimental Psychology: General*, 127(2), 161–188.
- Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate. *Behavior and Brain Sciences*, 23, 645–665.
- Sternberg, R. J. (2012). Intelligence. *Dialogues in Clinical Neuroscience*, 14(1), 19–27.
- Szentagotai, A., Schnur, J., DiGiuseppe, R., Macavei, B., Kallay, E., & David, D. (2005). The organization and the nature of irrational beliefs: Schemas or appraisal? *Journal of Cognitive & Behavioral Psychotherapies*, 5(2).
- Trull, T. J., Goodwin, A. H., Schopp, L. H., Hillenbrand, T. L., & Schuster, T. (1993). Psychometric properties of a cognitive measure of personality disorders. *Journal of Personality Assessment*, 61(3), 536–546.
- Vaske, J. J. (2008). *Survey research and analysis: Applications in parks, recreation and human dimensions*. State College, PA: Venture.
- Vaske, J. J., Beaman, J., & Sponarski, C. C. (2017). Rethinking internal consistency in Cronbach's alpha. *Leisure Sciences*, 39(2), 163–173.
- Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, 41, 321–327.
- Velicer, W. F., Eaton, C. A., & Fava, J. L. (2000). Construct explication through factor or component analysis: A review and evaluation of alternative procedures for determining the number of factors or components. In R. D. Goffin & E. Helmes (Eds.), problems and solutions in human assessment: Honoring Douglas N. Jackson at seventy. Norwell, MA: Kluwer academic.
- Vézina, J., & Bourque, P. (1984). The relationship between cognitive structure and symptoms of depression in the elderly. *Cognitive Therapy and Research*, 8(1), 29–36.

- Watanabe, S., Iwanaga, M., & Ozeki, Y. (2002). Effects of controllability and desire for control on coping and stress responses. *Japanese Journal of Health Psychology, 15*(1), 32–40.
- Watson, C. G., Vassar, P., Plemel, D., Herder, J., & Manifold, V. (1990). A factor analysis of Ellis' irrational belief. *Journal of Clinical Psychology, 46*, 412–415.
- Weissman, A. N., & Beck, A. T. (1978). *Development and validation of the dysfunctional attitude scale. Paper presented at the annual meeting of the association for the advanced behavior therapy.* Chicago: November.
- West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: Problems and remedies. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues and applications* (pp. 56–75). Newbery Park, CA: Sage.