Title
Development and psychometric properties of a new measure of irrational thinking: The Scale of Irrational Contents and Styles – Basics (SICS-B).

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The Scale of Irrational Contents and Styles – Basics (SICS-B)

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Development and psychometric properties of a new measure of irrational thinking: The Scale of Irrational Content and Styles – Basics (SICS-B).

Abstract

Objectives
Analyze the psychometric properties of a new measure for the assessment of the irrational beliefs proposed by Ellis in his model of Rational-Emotive-Behavioral Therapy (REBT): the *Scale of Irrational Contents and Styles – Basics (SICS-B)*. The *SICS-B* evaluates the "contents" of the three basic irrational beliefs (Ap: Approval, Pe: Perfectionism, and Co: Comfort) in relation to the four different "styles" (inferences or processes of thought) in which they can be expressed (DEM: Demandingness, AWF: Awfulizing, FI: Frustration Intolerance, and CON: Condemnation).

Methods
Participants: 259 respondents (79.5% women) undergraduates (63%) and (post)graduates (37%) between 18-63 years (M=26.5, SD=10.7). *Procedure:* A set of 72 statements were drafted (half in a rational way) using a 5-point Likert scale to cover the three areas of content and the four styles of irrational thinking (3x4 subscales), of which to choose the three items of each area with highest psychometric indices and elaborate with them the definitive scale of 36 items. *Psychometric Analysis:* The reliability and validity study was carried out through a comparative item analysis (average inter-item correlations, item-total correlations) and internal consistency (Ordinal α) of each subscale, and confirmatory factor analyses of several models.

Results
The *SICS-B* presents good indices of internal consistency and content validity. Confirmatory factor analyses validate the 3x4 model in which the three specific contents of the irrational beliefs are integrated with the four main styles of irrational thinking as proposed by the REBT.

Conclusions
The *SICS-B* is a reliable and valid short scale for the assessment of irrational beliefs.

Introduction

Rational Emotive Behavior Therapy (REBT) is a well-grounded psychological intervention model, although not without criticisms (e.g., Ellis, 1996, 2001; Neenan, 2001), with a long history and proven clinical utility (David, Cotet, Matu, Mogoase, and Stefan, 2018; David, Lynn, and Ellis, 2010). In REBT, *"irrational beliefs"* are considered central factors of dysfunctional emotions and maladaptive behaviors present in several kinds of emotional distress, clinical symptoms and psychopathological disorders (e.g., Balkis and Duru, 2019; Buschmann, Horn, Blankenship, García, and Bohan, 2018; Culhane and Watson, 2003; David, Montgomery, Macavei, and Bovbjer, 2005; Fives, Kong, Fuller, and DiGiuseppe, 2011; Fulton, Marcus and Merkey, 2010; Harrington, 2006; Martin and Dahlen, 2004; McDermut, Haaga, and Bilek, 1997; McDermut, Pantoja, and Amrami, 2019; McLennan, 1987; Muran and Motta, 1993; Newmark and Whitt, 1983; Samar, Walton, and McDermut, 2013; Woods and Lyons, 1990). From the perspective of REBT, irrational beliefs are, in essence, part of one's evaluative cognitions (appraisals) about oneself, others, and the functioning of the world that constitute the organising principles behind reality and one's own experience. Specifically, they are considered "irrational" due to their absolutist (rigid/dogmatic), illogical (founded on erroneous attributions/deductions), and dysfunctional (since they interfere with the realisation of one's objectives, generating emotional perturbation) nature (Ellis, 1994; Lega, Caballo and Ellis, 2002; Tobacyk and Milford, 1982). Ellis distinguishes such irrational beliefs in terms of their basic *contents* and of the *inferential thought processes* that are derived from them (Lega et al., 2002). The latter are at the root of the different types of prototypical dysfunctional attitude and, in what follows, are what we will call irrational *styles*.

The *content* of irrational beliefs refers to the "theme" (subject) they deal with. Fundamental themes are those that refer to the basic incentives or motivation for our lives (e.g., approval, perfection, or comfort). When these are irrationally considered to be demands (needs or dogmatic impositions) or requirements that we cannot renounce ("false needs" in Ellis' terms), then they induce the people who hold them to respond in a dysfunctional way (through upsetting negative emotions and maladapted behaviour). It is precisely this prototypical dysfunctional way that people respond when they try to satisfy the contents of such inescapable demands or needs "at all costs" what defines the irrational *style* of behaviour (e.g., awfulizer/catastrophizer, intolerant/victim mentality [FI, frustration intolerance, in Ellis' terms], or condemner/global-downing).

In the most recent version of his theory (Ellis, 1994, 1999; Ellis et al., 2010; Kendall et al., 1995; Lega et al., 2002; Sorribes and Lega, 2013), Ellis condenses the eleven beliefs initially proposed (Ellis, 1962; 1980) into just three basic irrational beliefs. By focusing on their content, they are designated and characterised as: seeking "Approval" (Ap), which is the need to be accepted and to be treated by everyone in a friendly, considerate, and respectful way; pursuing "Perfection" (Pe), which refers to the need to perform everything that one sets out to do flawlessly without any errors at all; and desiring "Comfort" (Co), which is defined as the need for the circumstances of one's life to be agreeable and pleasant, so that they do not lead to difficulties, awkwardness, or tension. As far as the styles (inferences or irrational secondary processes that are derived from the content) are concerned, Ellis suggests the following four. Being "Demanding" (DEM) is the general tendency to display rigid positions towards the satisfaction of false needs related to the contents already mentioned; that is, through requiring others to accept you and treat you well, through perfectionism in one's personal life, and in insisting on living an easy or comfortable life. "Awfulizing" (AWF) is the tendency to

magnify the negative aspects of an event which leads to the exaggerated conclusion that the consequences will be terrible. Having "Frustration intolerance" (FI) is the tendency to magnify what is unbearable about a situation and to see it as unsupportable when you realise that it rules out all possibility, present or future, of being happy or of satisfying the need that is considered an imperative. "Condemning" (CON) is the tendency to assess one's own worth or that of others, or the conditions of one's life as being negative as a result of individual behaviour (through error or omission) or the circumstances of one's life, which then compromises one's entire personal worth. When this last attitude is highly consolidated, the condemnation is also generalised towards others, towards the functioning of the world, or towards life in general, insofar as these fail to satisfy one's personal expectations.

In this way, each irrational belief has a basic content and this can be expressed fundamentally in the form of a "demand" (the DEM basic style towards a false need) using the terms of the specific content of the need (e.g., *'I need the <u>approval</u> of everybody who is important to me'*; *'I must be <u>perfect</u>'*, etc.). Meanwhile, it can also take on a more elaborate form and be expressed through exaggerated references to the consequences of not satisfying it (e.g., *'it <u>is</u> <u>horrible</u> that others think badly of me'*; *'<u>I cannot bear</u> to make mistakes'*, etc.). Similarly, each content can be expressed in any of the different styles either directly (e.g., *'I am very strict regarding my failures'*) or indirectly, in the negative form (e.g., *'I must not make a mistake'*); and also either rationally (e.g., *'I can handle it when people criticise me'*) or irrational (e.g., *'I must do everything perfectly'*). In addition, the focus of the demand can be oneself (e.g., *'I hate myself when I do not do as I should'*), others (e.g., '*People who say nasty things about me are cruel and heartless for doing it'*), or the world/life in general (e.g., *'It is awful that life is so complicated'*). In theory, and independently of the way in which they are expressed, the content of the belief and its style are associated, and it is possible to deduce

one from the other through following an "inferential chain". What makes some people different from others, as well as both the contents and styles of the irrational beliefs that we manifest, is the frequency of such beliefs and their intensity or the degree of adherence that we exercise towards them.

Several different scales have been designed to evaluate the irrational beliefs proposed by Ellis. However, currently there is no a 'gold standard' for the evaluation of REBT constructs, since many measures have failed to evaluate the relevant beliefs proposed by the theory, so that new instruments are currently being developed or refined (e.g., DiGiuseppe, Leaf, Gorman, and Robin, 2018; Hyland, Fox, Treacy, Maguire, Boduszek, and Vallières, 2017). An exhaustive review of most instruments developed is offered in Terjesen, Salhany, and Sciutto (2009) and also in Macavei and McMahon (2010). Of all the scales that evaluate irrational beliefs differentiating contents and styles, only the "Attitudes and Beliefs Inventory" (ABI) by Burgess (1990) has been adapted for use in Spanish (Caballo, Lega and González, 1996). Nevertheless, different studies have pointed out that the ABI presents a range of different psychometric problems, among which stand out the low internal consistency and the poor discriminatory validity of some of the irrational items in terms of the contents and styles proposed in the theory, together with the minimal use made of the rational items (Ruiz and Fusté, 2013; 2015; Suso-Ribera et al., 2016). This is why we herein present the new "Scale of Irrational Content and Styles – Basics" (SICS-B), the aim of which is to facilitate evaluation of the contents of the three "basic" irrational beliefs (Ap: approval, Pe: perfectionism, and Co: comfort) in relation to the four different styles (inferences or thought processes) through which they can manifest (DEM: demanding; AWF: awfulizing; FI: frustration intolerance; and CON: condemning) in accordance with the most recent

perspectives of REBT (Ellis, 1994, 1999; Ellis et al., 2010; Lega et al., 2002; Sorribes and Lega, 2013).

Objectives

The general objective of the present study is to analyse the psychometric properties of the "Scale of Irrational Content and Styles – Basics" (SICS-B) that we propose herein. More specifically, we aim to verify the internal consistency of the scale, together with its content validity.

Method

In general terms, the present work is an empirical study that uses a quantitative methodology; and specifically, it is an instrumental study whose chief objective is to analyse the psychometric properties of an assessment measure (Montero and León, 2007).

Participants

The participants were recruited through casual non-probability sampling, using the *snowball* technique, among the relatives and acquaintances of university students during a period when they had no exams or assessed activities (from the second half of February through to the end of March). Initially, 338 questionnaires were recovered. However, after rejecting the incomplete ones, the final sample consisted of 259 people (79.5% women) aged between 18 and 63 (mean=26.5; *SD*=10.7). Of the final sample, 95.4% were Caucasian. Almost all participants (91.5%) were born in Spain. The remaining participants were either born in Latin American countries (4.2%) or in European countries other than Spain. A total of 21.0% of the sample had no higher education qualifications, while 42.4% were current undergraduates, 26.5% were graduates, and 10.1% had a second degree (mater's or doctorate). In total, 49.0%

were single, 48.3% were married or in a relationship, and 2.7% were divorced or separated. Finally, 50.6% were unemployed, 47.0% worked, and the remaining 2.4% were retired or unfit for work.

Procedure

The following procedure was used to design the SICS-B, which we used to evaluate the content of each of the three basic beliefs, both in terms of the specific individual demands or needs and of the relation of each of these with the styles of thought in which this content can be expressed. Once we had defined the purpose of the study, each of the different types of content and styles of irrational thought contemplated in REBT was assigned to one of the three authors of the study (all of whom are certified specialists in this model of therapy). Each author then individually devised specific items for each content assigned to them (in its demand or *false need* modality), and for each of these in relation to the different styles of thought. Our intention was to write all the items in plain language that would be readily accessible to the general population (with a basic level of education). We therefore adopted colloquial expressions of the type that are often used to refer to the rational or irrational contents and styles that we intended to evaluate. Moreover, we aimed to capture the greatest possible variety of grammatical structures so as to avoid repeating the expressions typically associated with these contents and styles (e.g., I need…, I have to …, I must …, etc.) or with the way they are commonly integrated into phrases (if …, then…; I do not need … in order to …., etc.). Following this, each of the items that we had written individually was subjected to joint consideration by all three authors. At this stage, we revised and corrected the items until a final version met with the approval, in terms of the semantic and syntactic criteria required, of all authors.

Following Carretero-Dios and Pérez (2005), we drew up a long list of twice as many items as we expected to use for the final scale we were designing, in order to ensure a balanced representation of each of the sub-scales referring to the three basic items, with the best psychometric properties, after the corresponding analysis. In this way, we drew up a total of 72 items, which were distributed into 12 specific subscales with the same proportion of items in each. These subscales evaluate both the three basic demand (or false need) contents (3) and also each of these contents in relation to the four irrational styles through which they can be expressed (3x4). Each of these specific subscales consisted of six items with different formats: three written in the irrational form and three as rational content (inverted). However, in accordance with the ideas of REBT, the SICS-B scores are corrected where necessary so as to be interpreted in the direction of irrationality.

Meanwhile, SICS-B also allowed us to obtain seven "global" subscales that are made up of the total scores for each content in all the styles, together with those for the different styles in all the contents. In this way, we aim to offer different levels of analysis (specific and global), according to the aims and concerns behind the assessment.

Once we had all agreed on the final 72 items of SICS-B, we deliberately mixed them up so as to avoid the presentation of consecutive items dealing with the same content or style. We then carried out a pilot study with a small group of psychologists from the Spanish Association of Rational Emotive Behaviour Therapy (*Asociación Española de Terapia Racional Emotiva Conductual - AETREC*) for them to verify the validity of the items. Their comments contributed to shaping the definitive scale which we went on to use (see Appendix 1).

The format of the answers to the items is a 5-point Likert scale, which ranges from 0 to 4 (0: strongly disagree; 1: disagree; 2: neither agree nor disagree; 3: agree; 4: strongly agree), as this type of scale is the most commonly used to assess beliefs and attitudes. In addition, through the use of a Likert scale the scores obtained reflect a precise assessment of what is being measured, independently of the "rational" or "irrational" form in which the items are written.

The participants answered the SICS-B-72 via the Internet using the SurveyMonkey platform on a completely voluntary basis and anonymously, after having given written informed consent, and they received no compensation of any type for participating.

The study was approved by the Bioethics Committee of the University of Barcelona (Institutional Review Board: IRB00003099).

Data analysis

The reliability of SICS-B was assessed through an item-analysis (average inter-item correlation and item–total correlation) and an internal consistency analysis (ordinal α, and α coefficient without the respective item) of each subscale.

In accordance with Zumbo, Gadermann, and Zeisser (2007), Elosua and Zumbo (2008), and Gadermann, Ghun, and Zumbo (2012), it is more appropriate to analyse the reliability of Likert-type scales by means of coefficients other than Cronbach's alpha, such as ordinal alpha or Armor's theta coefficient. The main reason is that Cronbach's alpha is an estimated coefficient on a matrix of Pearson's correlations that assumes the continuous nature of the variables analyzed. Therefore, when the variables do not meet the requirement of continuity (e.g., Likert Scales), Cronbach's alpha coefficient has negative effects, underestimating

reliability (Elosua and Zumbo, 2008; Zumbo, Gadermann, and Zeisser, 2007). We report both Cronbach's alpha and Ordinal alpha to record this negative effect. The Ordinal alpha, on the other hand, is estimated from polychoric correlation matrices and not from Pearson product–moment correlations. In addition, when the distribution of the ordinal items is skewed or presents excessive kurtosis, and particularly if factorial analysis is to be performed, the calculation of polychoric correlations is also more suitable (Muthén and Kaplan, 1985; 1992; Domínguez, 2014). So, bearing in mind the ordinal nature of the answers to the items of the SICS-B (using a 5-point Likert scale), the reliability indices were obtained from the matrix of polychoric correlations of the items in each subscale. The respective polychoric correlation matrices were obtained using the FACTOR program, v. 10.3.01 (Lorenzo-Seva and Ferrando, 2015). The same program was used to analyze the multivariate normal distribution of the data with Mardia's coefficient (1970).

The ordinal α internal consistency coefficients were calculated through the procedure proposed by Domínguez (2012), while the corresponding confidence intervals (95%) were computed using the module expressly created for this purpose by Domínguez and Merino-Soto (2015). The analysis of items was performed with the STATISTICA program v.8 (StatSoft, 2007) and the rest of the analyses were conducted with SPSS v. 21 (IBM Corp., released 2012).

Analysis of the normal distribution of the scores for the items in each of the SICS-B sub-scales was carried out using the contrast set of skewness and kurtosis (k^2) reported by González, Abad, and Levy (2006). In accordance with this method, a value of k^2 of over 5.99 allows the null hypothesis (skewness and kurtosis of the normal distribution) to be rejected at a 5% level of significance.

Following Carretero-Dios and Pérez (2005), the criteria to determine the discriminatory

power of the items, and thus decide which of them would constitute the definitive scale, were

initially based on analysis of univariate statistical data (descriptors, skewness, and kurtosis).

We also used the corrected correlation coefficient for the item with the total of the

corresponding subscale (which had to be greater than .25 or .30), complemented with analysis

of the alpha coefficient of the subscale without the respective item (as this has to increase

when the item is removed). We then verified the average correlation between the items in

each subscale (between .15 and .50; with consistency being greater, the larger the coefficient)

comparing the initial version (SICS-B-72) and the definitive one (SICS-B-36).

The content validity of the SICS-B-72 and the SICS-B-36 was investigated in the present

study by means of a Confirmatory Factor Analysis (CFA), which complements a previous

study conducted with exploratory factor analysis (Ruiz, Sorribes, and Suso, 2019). Because

items were ordinal, but not continuous (i.e., categorical), we used the weighted least square

mean and variance adjusted estimator (WLSMV), which does not assume a normal

distribution and represents the preferred option for categorical and ordered data (Brown,

2006). In line with the REBT theory, five different models were explored on both scales: one

with 3 latent factors (only the 3 contents of irrational beliefs), another with 4 latent factors

(only the 4 styles of irrational thinking), another combining the 3x4 latent factors (combining

the 3 contents with the 4 styles), another integrating the 3x4 factors into 3 latent factors of

second-order (contents), and finally another integrating the 3x4 factors into 4 latent factors of

second-order (styles). Each model fit was evaluated with the Chi-square test (χ^2), the root

mean square error of approximation (RMSEA), the comparative fit index (CFI), and the

Tucker-Lewis index (TLI). RMSEA scores below .05 indicate an excellent model fit, while

scores below .08 should be interpreted as showing a good fit. CFI and TLI scores above .95

indicate an excellent fit, while values over .90 should be interpreted as revealing a good fit of

the model to the data (Hu and Bentler, 1999; Schreiber, Nora, Stage, Barlow, and King,

2006). In addition, we value as optimal factor loads those that were above .4 (Stevens, 2002;

cited in Field, 2013), and calculate the proportion of variance explained for each item of the

best model in the SICS-B-72 and the SICS-B-36.

The CFA was conducted with Mplus, version 6.12 (Muthén and Muthén, 2011).

The scores of the reverse items (that is, those that were written in the "rational" sense) were

recoded (inverted) prior to the analyses.

In what follows, we present the results of the psychometric data for the original scale with 72

items (SICS-B-72) together with the definitive version containing just 36 items (SICS-B-36).

This latter version consists of the three items with the best psychometric properties from each

subscale (see Appendix 2).

Results

Table 1 contains the descriptive statistics and internal consistency indices for SICS-B-72 and

SICS-B-36.

Insert Table 1 near here

In the SICS-B-72, the three content scales (Ap, Pe, and Co), in correspondence with the styles

of thought (DEM, AWF, FI, and CON), had reliability indices that were between acceptable

and good (ordinal α between.72 and .89). Meanwhile, the reliability (ordinal α) of the total content scales was between 0.91 and 0.94; and that of the total style scales, between .87 and .91. This indicates more than acceptable reliability for both total scales.

In the SICS-B-36, the three content scales (Ap, Pe, and Co), in correspondence with the four styles of thought (DEM, AWF, FI, and CON), also showed good reliability indices (ordinal α between .80 and .92). In addition, the reliability (ordinal α) of the total content scales ranged between .89 and .92. Similarly, the reliability (ordinal α) of the total style scales was between .82 and .90. All of these are within the 95% confidence interval, which also indicates good reliability. In addition, the average correlation between the items in each "specific" and "total" subscale was between .27 and .56. In both versions of SICS-B, the mean correlation between the items in the respective subscales was above the minimally acceptable limits, and they were higher for the SICS-B-36 version.

Table 2 shows the data from the analysis of the items in the "Approval" (Ap) subscale for each style of thought, both for SICS-B-72 and for SICS-B-36.

Insert Table 2 near here

The univariate statistics for almost all the items (except for items 18 and 32 in the Ap-CON sub-scale) had standard deviations greater than 1, with their respective means being around the mid-point of the values on the scale (except for item 32), which indicates that practically all the Ap items had high discriminatory power. However, the contrast set of the skewness and kurtosis (k^2) demonstrated that none of the items referring to this content in the different styles followed a normal distribution (all are above 5.99, at a significance level of 5%).

Concerning the SICS-B-72, the correlation coefficients of all the items with the total of their respective subscales (with the exception of items 18 and 23 in the Ap-CON subscale) showed an acceptable internal consistency (between .45 and .70). The same was also indicated by the reliability values for each subscale, as measured by the alpha coefficient without the respective item (which varied between .74 and .81), except for those in the Ap-CON subscale, which were below .70.

The SICS-B-36 includes, for each subscale of Approval, the three items from the SICS-B-72 with the best internal consistency values (item–total correlation and alpha without the item). Moreover, the correlation of each item is shown with the total of its own reduced subscale, along with the respective indices of reliability when we eliminate the item. In general, the items selected for the SICS-B-36 in the contents/style of Approval contribute to increasing the reliability of each of the subscales, if we consider the alpha without the respective item. If we compare the SICS-B-36 and the SICS-B-72, the item–total correlation coefficient tends to be lower in the former, except in Ap-CON, where it increases.

Table 3 shows the data from the analysis of the specific items in the "Perfectionism" (Pe) subscale for each style of thought, both in the SICS-B-72 and the SICS-B-36.

Insert Table 3 near here

The univariate statistics for the Pe items also showed, in general, a good level of discrimination, although the scores did not follow a normal distribution either ($k^2 > 5.99$).

In the SICS-B-72 the correlation coefficients for each item with the total of their respective subscale ranged from .53 to .69, which indicates a good degree of discrimination. The alpha without the item was between .68 and .82.

In the SICS-B-36 the three items selected for each subscale showed item–total correlation that varied from .52 to .66, and the indices of reliability, when we removed the respective items, were significantly reduced (compared with the SICS-B-72). This indicates the contribution of each item to the greater reliability of the SICS-B-36.

Table 4 shows the data from the analysis of the specific items in the "Comfort" (Co) subscale for each style of thought and for both the SICS-B-72 and the SICS-B-36.

Insert Table 4 near here

For the Co contents in their various irrational styles, the corresponding items did not fit a normal distribution either (except for item 19 of Co-DEM). Considering the descriptors, in general, the items showed adequate variability, except for item 34 in the Co-DEM scale and 35 in the Co-AWF scale.

In the SICS-B-72, the item–total correlation of the different subscales varied from .25 to .70; and the alpha without the item was between .52 and .81. In the SICS-B-36, the correlation of each item with the total of its own subscale ranged from .36 to .66, and the indices of reliability when we removed the respective item were between .41 and .77.

The multivariate descriptors skewness and kurtosis that were analysed by means of Mardia's test demonstrated significant kurtosis of the data, which means that they did not follow a normal distribution either in the SICS-B-72 or in the SICS-B-36.

With regards to the content validity of the scales, Table 5 contains the respective fit indices for the three models tested in the SICS-B-72 and the SICS-B-36 scales.

Insert Table 5 near here

As reported in Table 5, the CFA of the SICS-B-72 showed the best fit for the 3x4-factor model composed of the conjunction of the 3 contents in the 4 styles. A worse, yet acceptable fit was revealed for the 3 and 4-factor solutions. It is important to note that, in these two latter models, CFI and TLI values were clearly below the acceptable threshold, despite the RMSEA supported an adequate fit of the models. A closer look at the data revealed that the RMSEA of the baseline model in both cases was very small (between .155 and .156). As indicated by Kenny (2015), baseline model RMSEA scores below .158 result in non-informative CFA and TLI indices, so the RMSEA would be preferred in these cases to assess the fit of the models. Note also that the Chi-square test would suggest a poor model fit in all cases. However, it is frequent for models with a sufficiently large sample size, such as ours, to obtain such results. This again should emphasize the use of the RMSEA in our assessment of model fit.

Similar to the SICS-B-72, the 3x4-factor model composed of the 3 contents joint with the 4 styles obtained the best fit in the CFA of the SICS-B-36. Different from the SICS-B-72, a much worse fit was revealed for the 3 and 4-factor models.

Table 6 and Table 7 show the standardized factor loadings and the proportion of explained variance of items of the 3x4-factor model (the one that obtained the best fit indices) for the SICS-B-72 and the SICS-B-36 scales, respectively.

Insert Table 6 near here

Overall, items of SICS-B-72 showed adequate factor loadings (i.e., above .40) and proportion of explained variance, with a few exceptions (i.e., items 24, 33, 52, 23, and 6). All factor loadings were significant ($p < .001$).

Insert Table 7 near here

Unlike SICS-B-72, all items in SICS-B-36 showed more adequate factor loads (i.e., all above .40, and all significant at $p < .001$). Consequently, the proportion of explained variance is also higher for all items of SICS-B-36.

Discussion and conclusions

The aim of this study was to analyse the psychometric properties of the *Scale of Irrational Content and Styles - Basic (SICS-B),* which we designed specifically to assess the contents of the three basic irrational beliefs (Ap: Approval, Pe: Perfectionism, and Co: Comfort) in their "demanding" (DEM) or *false need* modality, and also in relation to the other styles of thought that they can give rise to (AWF: Awfulizing, FI: frustration intolerance, or CON: condemnation) according to the most recent REBT theory (Ellis, 1994, 1999; Ellis et al., 2010; Lega et al., 2002; Sorribes and Lega, 2013).

With respect to the internal consistency of the SICS-B, the three content scales (Ap, Pe, and Co) on their own (in their DEM modality), and in correspondence with the other styles of thought considered (AWF, FI, and CON), produced good reliability indices in each of their versions (average ordinal α around .85). In comparison, however, the SICS-B-36 presented indices that were slightly better than those of the SICS-B-72. This is supported by the average correlation between the items in the respective subscales, which are comparatively superior in the reduced version. The Ap-CON was the subscale of Approval, in relation to the different styles, that showed the lowest internal consistency indices (see Table 2).

Regarding the content validity, the SICS-B is a multidimensional scale consisting of 3x4-Factors (subscales). That is to say, our analyses support the need jointly consider both the contents and styles when interpreting the scale. While an acceptable fit was obtained when considering contents and styles separately with the SICS-B-72, the increase in the model fit using a combination of both components suggests that this would be the best solution to the data and, therefore, the best way to interpret the results, especially for the SICS-B-36. These findings are consistent with the theoretical basis REBT that considers that irrational beliefs can take the form of different contents in combination with particular thinking styles (Lega et al., 2002). The fact that each of the 3x4 combinations resulting from joining a specific content with a particular style cannot be grouped (unified) on the basis of the 3 contents or the 4 types of styles they share demonstrates their relative independence. That is, each of the 12 irrational tendencies has its own entity and they differ from each other, even if they share content or style. Therefore, the combination of both components (content and style) configures an irrational belief with its own meaning, which is different from that which denotes each of the contents or styles as a higher order category. In this sense, the SICS-B does not evaluate the contents or styles independently (separately), but in an integrated way. And each combination

of content x style constitutes a unit of irrational meaning itself, different from the others. Consequently, the total scores of the 3 contents or the 4 styles of the SICS-B (resulting from the respective partial scores) will be less informative, and more imprecise, than the specific scores of each of the 12 subscales that best characterizes the person. This fact supports the adequacy of the 3x4-Factors model to the data above the 3 and 4-factor models, which is further evidence of the robustness of the REBT theory from which the SICS-B has been designed.

Another important finding of the CFA was that the majority of items of the SICS-B-72 and all items of the SICS-B-36 revealed an adequate adjustment to the corresponding subscales. This is important because this reflects that the construction of items was mostly successful. There were only a few exceptions of items in the long scale which were not sufficiently aligned with the presumed factor and this problem was solved in the short version of the scale eliminating the problematic items. Therefore, the allocation and direction of the items on the scale are mostly satisfactory and the fact that the SICS-B-36 has both an adequate fit and a good item functioning is encouraging and should support the use of this shortened version of the SICS-B.

The use of a CFA is a strength of the present investigation. While exploratory factor analyses of similar scales are also frequent, they tend to be data-driven as opposed to theory-driven. This is important because CFA allows confirming models that might not show the best fit to the data but do have the best fit to the theoretical model. This minimizes the risk to obtain different factorial solutions that are atheoretical and largely dependent on the characteristics (e.g., educational level, culture, or age, to name some examples) of the sample analyzed.

Finally, we wish to make it clear that the present study presents certain limitations that need to be addressed in future analysis. These include the reduced sample size in relation to the extent of the scale, and especially in terms of the imbalance in the representation of the sexes, which limited our possibilities to analyse the existence of differences between men and women in the irrational contents and styles, which could be better characterised. Since the sample size of the present study is small, the means and standard deviations of the scale should not be considered representative of the population of Spain. However, this study provides a short version of the irrational belief scale (SICS-B-36) with which representative data from different populations (e.g., healthy populations or different clinical samples) can be obtained more quickly and easily. In addition, the convergent validity of SICS-B remains to be proven, which is also a limitation of the present study. Not having a validated scale in Spanish for the evaluation of irrational beliefs has made it impossible to analyze the convergent validity of the scale we present. However, that the data provided on the content validity of the SICS-B confirms the theoretical basis of the REBT, regarding the integration of content and styles of irrational beliefs, should minimize the negative impact of the impossibility of exploring the convergent validity of the scale.

In conclusion, and despite these limitations, the good levels of reliability and validity of the contents of the subscales of SICS-B overcome the shortcomings of the ABI, and allow an evaluation with adequate identification of people bearing in mind their most characteristic contents and styles of irrational thought. This means that the results of this preliminary study support its use in the general population with the aim of assessment and classification (Carretero-Dios and Pérez, 2005), which is reason to continue study along these lines.

Author contributions

All authors contributed to the study conception, design, material preparation, and data collection. Data analyses and the first draft of the manuscript were carried out by José Ruiz Rodríguez and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Conflicts of interest: All authors of the manuscript declare that they have no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the Bioethics Committee of the University of Barcelona (IRB00003099) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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Appendix 1. The SICS-B-72

TO WHAT DEGREE DO YOU AGREE WITH THE FOLLOWING STATEMENTS? Please make sure you have answered all the questions. Thank you very much for taking part in this survey.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. I often think that things should be easier.	0	1	2	3	4
2. * When I make a mistake, I don't put myself down because of it.	0	1	2	3	4
3. * I normally put up well with the frustration of not getting what I want.	0	1	2	3	4
4. One of the worst things that can happen to a person is to be rejected.	0	1	2	3	4
5. I get stressed out over everything being so complicated.	0	1	2	3	4
6. * When people make me feel uncomfortable, I don't think they do it deliberately.	0	1	2	3	4
7. * I think that difficulties form part of life.	0	1	2	3	4
8. * I'd be just as good a person even though not many people liked me.	0	1	2	3	4
9. * I'm not hooked on always doing things as well as possible.	0	1	2	3	4
10. * Just because my life is difficult doesn't mean that I'm any less of a person than other people are.	0	1	2	3	4
11. * It's not absolutely vital that the people around me like me.	0	1	2	3	4
12. It's awful to have defects and weaknesses.	0	1	2	3	4
13. It really annoys me if people don't like me.	0	1	2	3	4
14. *I put up well with my own and other people's mistakes.	0	1	2	3	4
15. * It's not so awful if I get criticised in public.	0	1	2	3	4
16. I don't like it when other people cause me a lot of problems.	0	1	2	3	4
17. * I don't have to be perfect.	0	1	2	3	4
18. * I don't think that people who reject me are necessarily bad people.	0	1	2	3	4
19. I shouldn't have so many complications in my life.	0	1	2	3	4
20. * Doing things wrong is not the end of the world.	0	1	2	3	4
21. I think that not being liked by others is very negative.	0	1	2	3	4
22. One of the worst things that can happen to you is to have lots of problems.	0	1	2	3	4
23. People who say nasty things about me are cruel and heartless for doing it.	0	1	2	3	4
24. For me, it's really bad if you don't make an effort to do things well.	0	1	2	3	4
25. I'm really strict about my mistakes.	0	1	2	3	4
26. It's horrible that life's so complicated.	0	1	2	3	4
27. It really annoys me not to meet other people's expectations of me.	0	1	2	3	4
28. It would be a disaster to often make mistakes.	0	1	2	3	4
29. * I don't get too bothered if people don't like me.	0	1	2	3	4
30. I think it's really important to have the approval of those around me.	0	1	2	3	4
31. I can't stand making mistakes.	0	1	2	3	4
32. If people don't like me it's because I'm less of a person than they are.	0	1	2	3	4
33. * I don't stress about always doing the right thing.	0	1	2	3	4
34. * I usually see problems as part of life.	0	1	2	3	4
35. * If my life is complicated, it's not a disaster.	0	1	2	3	4

Please continue on the next page

TO WHAT DEGREE DO YOU AGREE WITH THE FOLLOWING STATEMENTS? Please make sure you have answered all the questions. Thank you very much for taking part in this survey.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
36. * It's not a priority for me that other people like me.	0	1	2	3	4
37. I can't stand it when things don't go as I want.	0	1	2	3	4
38. I know that what other people think of me matters to me more than I'd like it to.	0	1	2	3	4
39. * In my opinion, it's not essential to do everything well.	0	1	2	3	4
40. * I tend to face up to a conflict rather than avoid it.	0	1	2	3	4
41. * Not meeting up to other people's expectations of me is something that I don't worry too much about.	0	1	2	3	4
42. If I get things wrong a lot, it's because I'm a disaster.	0	1	2	3	4
43. I'm one of those people who think that if you're not going to do something well, then you might as well not do it.	0	1	2	3	4
44. It's awful that people make my life so complicated.	0	1	2	3	4
45. * What people think and say about me doesn't affect me much.	0	1	2	3	4
46. * I usually think that my frustrations are the same as everybody else's.	0	1	2	3	4
47. When someone doesn't like me, I tend to think it's because of my faults.	0	1	2	3	4
48. People should make things easier for me.	0	1	2	3	4
49. * When I make a mistake, I don't beat myself up about it.	0	1	2	3	4
50. I think badly of myself when I don't do what I ought to.	0	1	2	3	4
51. I get really annoyed about not doing things well.	0	1	2	3	4
52. * I put up well with people being selfish.	0	1	2	3	4
53. If things aren't easy for me, it's my own fault.	0	1	2	3	4
54. * Being rejected by someone important is not such a big deal for me.	0	1	2	3	4
55. I consider myself to be a real perfectionist.	0	1	2	3	4
56. * I can handle my mistakes.	0	1	2	3	4
57. * I deal fine with life's problems.	0	1	2	3	4
58. For me, being liked by others is really important.	0	1	2	3	4
59. * I don't see difficulties as a catastrophe.	0	1	2	3	4
60. * If people say bad things about me it's not a big deal.	0	1	2	3	4
61. When I find things difficult, I think that I'm good for nothing.	0	1	2	3	4
62. * I'm not perfect but even so I'm happy with myself.	0	1	2	3	4
63. I can't stand being criticised.	0	1	2	3	4
64. I get really annoyed if I don't do what I should.	0	1	2	3	4
65. * I tend to look on the bright side of the bad things that happen to me.	0	1	2	3	4
66. * It's not the end of the world to have defects.	0	1	2	3	4
67. * When people reject me, I don't put myself down because of it.	0	1	2	3	4
68. If people make things really complicated for me, it's because they are bad people.	0	1	2	3	4
69. It's horrible when others think bad things about me.	0	1	2	3	4
70. * For me, making mistakes is not a big deal.	0	1	2	3	4
71. If I make mistakes, it's because I'm useless.	0	1	2	3	4
72. * I cope with it well when people criticise me.	0	1	2	3	4

* Inverted items (statements in rational format), which are to be reverse scored.

Appendix 2. The SICS-B-36

TO WHAT DEGREE DO YOU AGREE WITH THE FOLLOWING STATEMENTS? Please make sure you have answered all the questions. Thank you very much for taking part in this survey.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. (38) I know that what other people think of me matters to me more than I'd like it to.	0	1	2	3	4
2. (70) * For me, making mistakes is not a big deal.	0	1	2	3	4
3. (37) I can't stand it when things don't go as I want.	0	1	2	3	4
4. (47) When someone doesn't like me, I tend to think it's because of my faults.	0	1	2	3	4
5. (64) I get really annoyed if I don't do what I should.	0	1	2	3	4
6. (35) * If my life is complicated, it's not a disaster.	0	1	2	3	4
7. (27) It really annoys me not to meet other people's expectations of me.	0	1	2	3	4
8. (62) * I'm not perfect but even so I'm happy with myself.	0	1	2	3	4
9. (1) I often think that things should be easier.	0	1	2	3	4
10. (15) * It's not so awful if I get criticised in public.	0	1	2	3	4
11. (55) I consider myself to be a real perfectionist.	0	1	2	3	4
12. (10) * Just because my life is difficult doesn't mean that I'm any less of a person than other people are.	0	1	2	3	4
13. (58) For me, being liked by others is really important.	0	1	2	3	4
14. (66) * It's not the end of the world to have defects.	0	1	2	3	4
15. (5) I get stressed out over everything being so complicated.	0	1	2	3	4
16. (67) * When people reject me, I don't put myself down because of it.	0	1	2	3	4
17. (31) I can't stand making mistakes.	0	1	2	3	4
18. (59) * I don't see difficulties as a catastrophe.	0	1	2	3	4
19. (72) * I cope with it well when people criticise me.	0	1	2	3	4
20. (50) I think badly of myself when I don't do what I ought to.	0	1	2	3	4
21. (48) People should make things easier for me.	0	1	2	3	4
22. (60) * If people say bad things about me it's not a big deal.	0	1	2	3	4
23. (9) * I'm not hooked on always doing things as well as possible.	0	1	2	3	4
24. (53) If things aren't easy for me, it's my own fault.	0	1	2	3	4
25. (36) * It's not a priority for me that other people like me.	0	1	2	3	4
26. (20) * Doing things wrong is not the end of the world.	0	1	2	3	4
27. (57) * I deal fine with life's problems.	0	1	2	3	4
28. (32) If people don't like me it's because I'm less of a person than they are.	0	1	2	3	4
29. (51) I get really annoyed about not doing things well.	0	1	2	3	4
30. (26) It's horrible that life's so complicated.	0	1	2	3	4
31. (63) I can't stand being criticised.	0	1	2	3	4
32. (71) If I make mistakes, it's because I'm useless.	0	1	2	3	4
33. (19) I shouldn't have so many complications in my life.	0	1	2	3	4
34. (69) It's horrible when others think bad things about me.	0	1	2	3	4
35. (17) * I don't have to be perfect.	0	1	2	3	4
36. (61) When I find things difficult, I think that I'm good for nothing.	0	1	2	3	4

The original numbering of the items in the ECEI-B-72 is shown in parentheses.
* Inverted items (statements in rational format), which are to be reverse scored.

Table 1. Descriptive statistics and internal consistency indices of the SICS-B-72 and the SICS-B-36

Subscales	SICS-B-72								SICS-B-36							
	Nº Items	N	M	SD	Cronbach's α	Ordinal α	CI (95%)**	Inter-item average Cor.	Nº Items	N	M	SD	Cronbach's α	Ordinal α	CI (95%)**	Inter-item average Cor.
Ap-DEM	6	259	11.20	4.46	.84	.88	[.85, .90]	.48	3	259	5.55	2.86	.79	.88	[.85, .90]	.56
Ap-AWF	6	259	11.66	4.87	.79	.85	[.81, .88]	.40	3	259	5.53	2.87	.78	.87	[.84, .90]	.55
Ap-FI	6	259	11.93	5.16	.81	.87	[.84, .90]	.45	3	259	6.35	2.85	.73	.85	[.81, .88]	.52
Ap-CON	5*	259	6.59	3.49	.60	.77	[.71, .81]	.28	3	259	4.02	2.62	.68	.85	[.81, .88]	.47
Ap-Total	23	259	41.39	16.31	.93	.94	[.92, .95]	.38	12	259	21.45	9.48	.90	.92	[.90, .94]	.45
Pe-DEM	6	259	12.59	5.17	.79	.86	[.82, .90]	.41	3	259	6.15	3.04	.73	.86	[.82, .89]	.50
Pe-AWF	6	259	9.08	4.38	.73	.82	[.78, .86]	.35	3	259	3.45	2.50	.72	.87	[.84, .90]	.53
Pe-FI	6	259	12.66	4.68	.77	.85	[.81, .88]	.38	3	259	6.61	2.78	.76	.87	[.84, .90]	.53
Pe-CON	6	259	8.71	5.34	.83	.89	[.86, .91]	.49	3	259	3.49	2.79	.73	.87	[.84, .90]	.54
Pe-Total	24	259	43.06	16.50	.92	.93	[.91, .94]	.36	12	259	19.70	8.99	.88	.91	[.89, .93]	.41
Co-DEM	5*	259	7.88	3.22	.64	.77	[.71, .81]	.27	3	259	5.58	2.34	.69	.82	[.78, 86]	.42
Co-AWF	6	259	7.72	4.69	.82	.88	[.85, .90]	.47	3	259	3.52	2.43	.75	.87	[.84, .90]	.54
Co-FI	6	259	11.93	4.28	.70	.80	[.75, .84]	.29	3	259	5.47	2.48	.62	.80	[.75, .84]	.36
Co-CON	6	259	8.11	3.93	.58	.76	[.70, .81]	.23	3	259	3.85	2.49	.57	.80	[.75, .84]	.37
Co-Total	23	259	35.66	13.31	.89	.91	[.88, .93]	.29	12	259	18.42	7.84	.86	.89	[.86, .91]	.36
DEM-Total	17	259	31.67	10. 26	.84	.87	[.84, .90]	.26	9	259	17.28	5.93	.75	.82	[.78, .86]	.27
AWF-Total	18	259	28.48	11.66	.89	.91	[.89, .93]	.34	9	259	12.50	6.40	.85	.89	[.86, .91]	.42
FI-Total	18	259	36.54	11.93	.89	.91	[.89, .93]	.32	9	259	18.43	6.80	.84	.88	[.85, .90]	.39
CON-Total	17	259	23.42	10.85	.87	.90	[.87, .92]	.33	9	259	11.36	6.90	.85	.90	[.87, .92]	.46

Note: N: Sample size; M: Mean; SD: Standard Deviation; CI: Confidence Interval (95%) for Ordinal α. * In the subscales Ap-CON and Co-DEM items 8 and 7 were eliminated because no participant had marked the answer option 'totally agree', which made it impossible to obtain the corresponding matrices of polychoric correlations for the calculation of the ordinal alpha. ** Fischer Method (1950).

Table 2. Analysis of items of the *"Approval" subscales (Ap)* of the SICS-B-72 and the SICS-B-36

			Univariate statistics					SICS-B-72		SICS-B-36		
Subscales	Items	M	CI (95%)	SD	As $(\sigma_e= .151)$**	Ku $(\sigma_e= .302)$**	k^2	Item-Total correlation	α without the item	Items	Item-Total correlation	α without the item
Ap-DEM	11	1,50	[1.32, 1.69]	1.17	.293	-1.079	16.530	.58	.82	–	–	–
	30	2.28	[2.10, 2.46]	1.11	- .266	- .934	12.668	.50	.79	–	–	–
	36	**1.48**	**[1.31, 1.65]**	**1.08**	**.316**	**- .820**	**11.752**	**.65**	**.76**	**36**	**.65**	**.69**
	38	**2.25**	**[2.04, 2.45]**	**1.27**	**- .293**	**-1.110**	**17.274**	**.70**	**.75**	**38**	**.63**	**.72**
	45	1.86	[1.68, 2.04]	1.14	- .003	-1.119	13.730	.63	.76	–	–	–
	58	**1.83**	**[1.66, 2.00]**	**1.06**	**.025**	**- .836**	**7.690**	**.65**	**.76**	**58**	**.62**	**.72**
Ap-AWF	4	2.06	[1.85, 2.26]	1.28	- .142	-1.182	16.203	.46	.78	–	–	–
	15	**2.41**	**[2.22, 2.61]**	**1.22**	**- .328**	**-1.042**	**16.623**	**.61**	**.75**	**15**	**.60**	**.74**
	21	1.25	[1.08, 1.43]	1.12	.582	- .687	20.031	.50	.77	–	–	–
	54	2.81	[2.63, 2.98]	1.10	- .906	.067	36.049	.48	.78	–	–	–
	60	**1.72**	**[1.54, 1.90]**	**1.12**	**.004**	**-1.030**	**11.633**	**.62**	**.74**	**60**	**.67**	**.65**
	69	**1.40**	**[1.22, 1.57]**	**1.10**	**.384**	**- .892**	**15.191**	**.62**	**.74**	**69**	**.60**	**.73**
Ap-FI	13	1.57	[1.38, 1.77]	1.20	.188	-1.187	16.999	.59	.80	–	–	–
	27	**2.41**	**[2.21, 2.61]**	**1.25**	**- .529**	**- .806**	**19.396**	**.62**	**.79**	**27**	**.44**	**.82**
	29	1.78	[1.60, 1.97]	1.14	.126	-1.104	14.060	.54	.81	–	–	–
	41	2.40	[2.05, 2.42]	1.16	- .328	- .779	11.372	.55	.81	–	–	–
	63	**1.83**	**[1.65, 2.02]**	**1.14**	**.098**	**- .963**	**10.589**	**.65**	**.79**	**63**	**.64**	**.59**
	72	**2.09**	**[1.91, 2.28]**	**1.15**	**- .175**	**- .960**	**11.448**	**.62**	**.79**	**72**	**.66**	**.57**
Ap-CON*	18	1.20	[1.04, 1.36]	.99	.670	- .242	20.330	.28	.67	–	–	–
	23	1.37	[1.21, 1.54]	1.04	.347	- .671	10.218	.23	.69	–	–	–
	32	**.55**	**[.42, .69]**	**.84**	**1.673**	**2.632**	**198.710**	**.48**	**.62**	**32**	**.50**	**.70**
	47	**1.78**	**[1.58, 1.98]**	**1.27**	**.089**	**-1.207**	**16.321**	**.45**	**.62**	**47**	**.59**	**.57**
	67	**1.69**	**[1.50, 1.88]**	**1.20**	**.138**	**-1.147**	**15.260**	**.53**	**.58**	**67**	**.57**	**.58**

Note: M: Mean; CI: Confidence Interval (95%); SD: Standard Deviation; As: Asymmetry; Ku: Kurtosis. k^2: Joint contrast statistic of symmetry and kurtosis.
*Item 8 was eliminated from this subscale (see Table 1). ** σ_e: Standard error. In bold the most discriminative items.

Table 3. Analysis of items of the *"Perfectionism" subscales (Pe)* of the SICS-B-72 and the SICS-B-36

Subscales	Items	M	CI (95%)	SD	As (σ_e= .151)**	Ku (σ_e= .302)**	k^2	SICS-B-72 Item-Total correlation	SICS-B-72 α without the item	Items	SICS-B-36 Item-Total correlation	SICS-B-36 α without the item
Pe-DEM	**9**	**1.89**	**[1.70, 2.09]**	**1.23**	**.032**	**-1.230**	**16.633**	**.59**	**.77**	**9**	**.52**	**.73**
	17	**1.87**	**[1.66, 2.08]**	**1.31**	**.105**	**-1.221**	**16.830**	**.67**	**.75**	**17**	**.66**	**.56**
	25	2.38	[2.20, 2.56]	1.13	- .525	- .640	16.579	.57	.77	–	–	–
	39	1.84	[1.66, 2.02]	1.23	.085	-1.095	13.463	.52	.78	–	–	–
	43	2.23	[2.03, 2.43]	1.24	- .241	-1.057	14.797	.40	.81	–	–	–
	55	**2.39**	**[2.19, 2.58]**	**1.22**	**- .322**	**- .993**	**15.359**	**.63**	**.76**	**55**	**.55**	**.69**
Pe –AWF	12	1.11	[.93, 1.29]	1.14	.787	- .452	29.404	.49	.71	–	–	–
	20	**1.02**	**[.86, 1.18]**	**1.02**	**.898**	**- .015**	**35.370**	**.53**	**.70**	**20**	**.60**	**.68**
	24	2.38	[2.20, 2.56]	1.14	- .487	- .568	13.939	.24	.77	–	–	–
	28	2.15	[1.97, 2.34]	1.18	- .301	- .978	14.461	.51	.70	–	–	–
	66	**.81**	**[.66, .96]**	**.94**	**1.200**	**.988**	**73.858**	**.62**	**.68**	**66**	**.66**	**.63**
	70	**1.61**	**[1.43, 1.79]**	**1.15**	**.177**	**-1.091**	**14.425**	**.56**	**.69**	**70**	**.55**	**.75**
Pe –FI	14	1.82	[1.64, 1.99]	1.09	.250	- .949	12.616	.48	.76	–	–	–
	31	**1.86**	**[1.67, 2.05]**	**1.20**	**- .007**	**-1.098**	**13.221**	**.58**	**.74**	**31**	**.60**	**.69**
	33	1.99	[1.80, 2.17]	1.15	- .023	- .953	9.981	.42	.78	–	–	–
	51	**2.58**	**[2.41, 2.75]**	**1.08**	**- .684**	**- .405**	**22.318**	**.61**	**.73**	**51**	**.64**	**.65**
	56	2.22	[2.04, 2.40]	1.12	- .409	- .787	14.128	.50	.76	–	–	–
	64	**2.17**	**[1.99, 2.35]**	**1.10**	**- .202**	**- .914**	**10.949**	**.62**	**.73**	**64**	**.57**	**.72**
Pe –CON	2	1.86	[1.66, 2.06]	1.26	- .048	-1.262	17.563	.57	.84	–	–	–
	42	1.28	[1.09, 1.47]	1.18	.615	- .684	21.718	.64	.82	–	–	–
	49	2.08	[1.90, 2.27]	1.16	- .180	-1.037	13.212	.62	.83	–	–	–
	50	**1.59**	**[1.39, 1.78]**	**1.23**	**.241**	**-1.079**	**15.313**	**.66**	**.82**	**50**	**.59**	**.72**
	62	**1.17**	**[.99, 1.36]**	**1.17**	**.872**	**- .164**	**33.644**	**.65**	**.82**	**62**	**.62**	**.69**
	71	**.73**	**[.56, .90]**	**1.06**	**1.467**	**1.213**	**110.518**	**.69**	**.82**	**71**	**.63**	**.68**

Note: M: Mean; CI: Confidence Interval (95%); SD: Standard Deviation; As: Asymmetry; Ku: Kurtosis. k^2: Joint contrast statistic of symmetry and kurtosis. *Item 8 was eliminated from this subscale (see Table 1). ** σ_e: Standard error. In bold the most discriminative items.

Table 4. Analysis of items of the "Comfort" subscales (Co) of the SICS-B-72 and the SICS-B-36

			Univariate statistics					SICS-B-72		SICS-B-36		
Subscales	Items	M	CI (95%)	SD	As $(\sigma_e= .151)$**	Ku $(\sigma_e= .302)$**	k^2	Item-Total correlation	α without the item	Items	Item-Total correlation	α without the item
Co-DEM*	**1**	**2.32**	**[2.16, 2.49]**	**1.01**	**- .389**	**- .386**	**8.270**	**.40**	**.58**	**1**	**.45**	**.65**
	19	**1.98**	**[1.83, 2.14]**	**.99**	**- .080**	**- .398**	**2.017**	**.49**	**.54**	**19**	**.59**	**.47**
	34	.85	[.71, .98]	.85	1.090	1.273	69.876	.35	.60	–	–	–
	40	1.45	[1.26, 1.64]	1.19	.465	- .854	17.480	.25	.65	–	–	–
	48	**1.26**	**[1.10, 1.42]**	**.98**	**.362**	**- .673**	**10.713**	**.43**	**.56**	**48**	**.46**	**.64**
Co –AWF	22	1.55	[1.37, 1.72]	1.10	.376	- .887	14.827	.59	.81	–	–	–
	26	**1.32**	**[1.16, 1.49]**	**1.05**	**.390**	**- .729**	**12.498**	**.70**	**.79**	**26**	**.54**	**.77**
	35	.99	[.84, 1.14]	.93	.816	.022	29.208	.68	.80	35	.66	.64
	44	1.33	[1.16, 1.50]	1.06	.398	- .714	12.537	.61	.81	–	–	–
	59	**1.19**	**[1.03, 1.35]**	**.99**	**.693**	**- .236**	**21.673**	**.64**	**.80**	**59**	**.63**	**.67**
	65	1.33	[1.15, 1.52]	1.17	.644	- .595	22.071	.47	.84	–	–	–
Co –FI	3	2.01	[1.83, 2.20]	1.18	- .130	-1.097	13.936	.49	.66	–	–	–
	5	**1.70**	**[1.52, 1.88]**	**1.14**	**.107**	**- .974**	**10.904**	**.48**	**.66**	**5**	**.43**	**.54**
	16	1.59	[1.42, 1.76]	1.07	.109	- .928	9.963	.44	.67	–	–	–
	37	**2.25**	**[2.08, 2.43]**	**1.11**	**- .326**	**- .935**	**14.246**	**.53**	**.64**	**37**	**.42**	**.55**
	52	2.86	[2.68, 3.04]	1.14	- .780	- .345	27.988	.26	.73	–	–	–
	57	**1.51**	**[1.35, 1.68]**	**1.03**	**.384**	**- .648**	**11.071**	**.47**	**.66**	**57**	**.46**	**.49**
Co –CON	6	1.64	[1.47, 1.82]	1.11	.468	- .513	12.491	.29	.62	–	–	–
	10	**.98**	**[.82, 1.15]**	**1.05**	**.863**	**- .050**	**32.691**	**.38**	**.59**	**10**	**.36**	**.64**
	46	1.57	[1.39, 1.76]	1.14	.402	- .849	14.991	.28	.63	–	–	–
	53	**1.41**	**[1.24, 1.58]**	**1.07**	**.438**	**- .548**	**11.707**	**.44**	**.57**	**53**	**.46**	**.52**
	61	**1.46**	**[1.26, 1.65]**	**1.24**	**.499**	**- .966**	**21.152**	**.53**	**.52**	**61**	**.52**	**.41**
	68	1.02	[.87, 1.17]	.95	.754	- .038	24.950	.30	.62	–	–	–

Note: M: Mean; CI: Confidence Interval (95%); SD: Standard Deviation; As: Asymmetry; Ku: Kurtosis. k^2: Joint contrast statistic of symmetry and kurtosis. *Item 7 was eliminated from this subscale (see Table 1).** σ_e: Standard error. In bold the most discriminative items.

Table 5. Fit indices for tested models in the SICS-B-72 and the SICS-B-36

Scale	Models	χ^2	df	p	RMSEA	IC (90%)	CFI	TLI
SICS-B-72	3-Factors	4182.889	2342	< .001	.055	(.052, .058)	.878	.875
	4-Factors	4790.174	2339	< .001	.064	(.061, .066)	.838	.833
	3x4-Factors	3689.842	2279	< .001	.049	(.046, .052)	.907	.901
	(3x4)*3-Factors 2nd-order	4241.675	2333	< .001	.056	(.054, .059)	.874	.870
	(3x4)*4-Factors 2nd-order	4411.980	2327	< .001	.056	(.056, .061)	.862	.857
SICS-B-36	3-Factors	1647.296	591	< .001	.083	(.078, .088)	.880	.872
	4-Factors	1974.619	588	< .001	.095	(.091, .100)	.843	.831
	3x4-Factors	1078.916	528	< .001	.063	(.058, .069)	.937	.925
	(3x4)*3-Factors 2nd-order	1483.732	582	< .001	.077	(.072, .082)	.898	.889
	(3x4)*4-Factors 2nd-order	1658.636	576	< .001	.085	(.080, .090)	.877	.866

Table 6. Factor loadings and proportion of explained variance of the 3x4-Factors Model in the SICS-B-72

3x4 Factors	Items	Loadings	Prop. of Variance	Prop. of Error
Ap-DEM	11	.679	.46	.54
	30	.640	.41	.59
	36	.765	.59	.41
	38	.816	.67	.33
	45	.749	.56	.44
	58	.697	.49	.51
Pe-DEM	9	.747	.56	.44
	17	.754	.57	.43
	25	.747	.56	.44
	39	.724	.53	.48
	43	.363	.13	.82
	55	.598	.36	.64
Co-DEM	1	.476	.23	.78
	19	.568	.32	.68
	34	.675	.46	.55
	40	.558	.31	.69
	48	.560	.31	.69
Ap-AWF	4	.533	.28	.72
	15	.717	.51	.49
	21	.626	.39	.61
	54	.598	.36	.64
	60	.760	.58	.42
	69	.775	.60	.40
Pe-AWF	12	.640	.41	.59
	20	.620	.38	.62
	28	.674	.45	.55
	66	.777	.60	.40
	70	.674	.45	.55
	24	.332	.11	.89
Co-AWF	22	.651	.42	.58
	35	.797	.64	.36
	26	.762	.58	.42
	44	.692	.48	.52
	59	.831	.69	.31
	65	.656	.43	.57
Ap-FI	13	.748	.56	.44
	27	.781	.61	.39
	29	.693	.48	.52
	41	.593	.35	.65
	63	.760	.58	.42
	72	.713	.51	.49
Pe-FI	14	.630	.40	.60
	31	.773	.60	.40
	33	.393	.15	.85
	51	.711	.51	.49
	56	.627	.39	.61
	64	.692	.48	.52
Co-FI	3	.655	.43	.57
	5	.574	.33	.67
	16	.469	.22	.78
	37	.676	.46	.54
	57	.734	.54	.46
	52	.268	.07	.93
Ap-CON	18	.420	.18	.82
	23	.346	.12	.88
	32	.669	.45	.55
	47	.632	.40	.60
	67	.745	.56	.44

	2	.602	.36	.64
	42	.757	.57	.43
	49	.757	.57	.43
Pe-CON	50	.722	.52	.48
	62	.764	.58	.42
	71	.799	.64	.36
	10	.433	.19	.81
	46	.441	.19	.81
Co-CON	53	.506	.26	.74
	61	.807	.65	.35
	68	.421	.18	.82
	6	.285	.08	.92

Note. All factor loadings were significant ($p < .001$)

Table 7. Factor loadings and proportion of explained variance of the 3x4-Factors Model in the SICS-B-36

3x4 Factors	Items	Loadings	Prop. of Variance	Prop. of Error
Ap-DEM	36	.776	.60	.40
	38	.848	.72	.28
	58	.712	.51	.49
Pe-DEM	9	.784	.61	.39
	17	.792	.63	.37
	55	.609	.37	.63
Co-DEM	1	.650	.42	.58
	19	.755	.57	.43
	48	.694	.48	.52
Ap-AWF	15	.726	.53	.47
	60	.790	.62	.38
	69	.806	.65	.35
Pe-AWF	20	.676	.46	.54
	66	.851	.72	.28
	70	.719	.52	.48
Co-AWF	26	.723	.52	.48
	35	.765	.59	.41
	59	.825	.68	.32
Ap-FI	27	.774	.60	.40
	63	.810	.66	.34
	72	.755	.57	.43
Pe-FI	31	.835	.70	.30
	51	.735	.54	.46
	64	.719	.52	.48
Co-FI	5	.562	.32	.68
	37	.614	.38	.62
	57	.699	.49	.51
Ap-CON	32	.703	.49	.51
	47	.661	.44	.56
	67	.772	.60	.40
Pe-CON	50	.698	.49	.51
	62	.753	.57	.43
	71	.788	.62	.38
Co-CON	10	.467	.22	.78
	53	.530	.28	.72
	61	.869	.76	.24

Note. All factor loadings were significant ($p < .001$)