Body checking, body avoidance and social behavior: The factorial structure of the Dutch translation of the Body Checking and Avoiding Questionnaire in a healthy female college sample.

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Abstract

Body checking and body avoidance are the two main components of the behavioral aspect of body image disturbances (BID), which is a core feature of multiple eating disorders (ED). The behavioral component of BID has not gotten as much attention as other components, partly because the assessment has been lacking in quality. This study looked at the internal structure of a new measure which aspires to measure the behavioral aspect of BID, the Body Checking and Avoidance Questionnaire (BCAQ). An online survey with N=69 healthy female students showed that the BCAQ consists of a three-factorial structure, is internally reliable and the factors correlate with each other. This study is the beginning of the validation of the Dutch version of the BCAQ. Further research into this measure should confirm the factorial structure and look extensively into the external validity as well as the internal validity within an ED sample. Further research should focus on a clinical sample, different measures and stability over time.

Keywords: Body checking; body avoiding; eating disorder; body image disturbance; social.

1. **Introduction**

The last decades, there has been a growing interest in body image disturbance/disfunction (BID) (Reas, Whisenhunt, Netemeyer, & Williamson, 2002). BID is conceptualized as dissatisfaction with one's body, concern over this dissatisfaction, and impairment in either social relations, social activities or occupational functioning (Cash, Phillips, Santos & Hrabosky, 2004). Hrabosky et al. (2009) found that people with higher levels of BID, have lower quality of life. BIDs have been found in multiple types of psychopathology, including body dysmorphic disorder (Ruffolo, Philips, Menard, Fay & Weisberg, 2006), social phobia (Atalay & Gençöz, 2008; Aderka, Gutner, Lazarov, Hermesh, Hofmann & Marom, 2014), obsessive-compulsive disorder (Aderka et al., 2014) and eating

disorders (ED) (Legenbauer, Martin, Blascke, Schwenzfeier, Blechert, & Snicker, 2017). One aspect of BID is the individual evaluative dissatisfaction with one's body, also called body dissatisfaction (Coker & Abraham, 2014). There is, however, an important distinction between body dissatisfaction and BID. Body dissatisfaction is merely the dissatisfaction with one's body, or a specific feature of one's body; the impact of this dissatisfaction does not necessarily result in negative everyday experiences, contrary to BID, which does result in negative everyday experiences (Cash et al., 2004). Whereas BID is linked to different kinds of psychopathology, body dissatisfaction has also been widely found in the general population (Cash et al., 2004) and is highly prevalent in women (Coker & Abraham, 2014).

BID is specifically related to EDs (Legenbauer et al., 2017). Patients with an ED often experience BID, which can be divided in three components: perceptual, affective/cognitive, and behavioral. Perceptual disturbances consist of the overestimation of body size for patients with anorexia nervosa (AN) (Waldman, Loomes, Mountford & Tchanturia, 2013) and bulimia nervosa (BN) (Cash & Deagle, 1997), in contrast to the underestimation of body size in healthy controls (Vocks, Legenbauer, Rüddel & Troje, 2007). Affective/cognitive disturbances consist of negative attitudes towards one's own body, and often fear of gaining weight (Zanetti, Santonastaso, Sgaravatti, Degortes & Favaro (2012). Patients with AN or BN report greater dissatisfaction with their entire bodies and aspects thereof, and more concerns over this dissatisfaction than healthy controls (Hrabosky et al., 2009).

The behavioral aspect is conceptualized as having two components; checking and avoiding (Legenbauer et al., 2017; Nikodijevic, Buck, Fuller-Tyszkiewicz, de Paoli & Krug, 2018). Checking can be defined as frequent and repetitive behavior in which an individual monitors his or her own body in multiple ways (Legenbauer et al., 2017; Nikodijevic et al., 2018). This can be done by weighing, looking in the mirror or checking the size of specific

body parts. Avoiding can be defined as avoiding certain (social) situations in which someone's body would be exposed (Legenbauer et al., 2017).

Research has shown that body checking and avoidance correlates strongly with ED symptoms, in healthy controls as well as ED patients (Meyer, Partlan, Rawlinson, Bunting & Waller, 2011; Nikodijevic et al., 2018). For healthy controls, there is a positive relationship between ED symptoms and body checking and body avoidance (Meyer et al., 2011). In a meta-analysis by Nikodijevic et al. (2018) it was found that body checking behavior was more prevalent in patients with EDs in comparison to healthy controls. No difference was found between the different types of EDs. Avoidance behavior was also found to be more prevalent in patients with EDs compared to healthy controls. Differences between EDs types were found, in that patients with an eating disorder not otherwise specified (EDNOS) reported higher avoidance behavior than people with AN and BN.

Both the perceptual and cognitive/affective aspects of BID have got substantive attention (Zanetti et al., 2012; Espeset, Nordbø, Gulliksen, Skårderud, Geller & Holte, 2011; Vocks, Schulte, Busch, Grönemeyer, Herpertz & Suchan, 2011; Eshkevari, Rieger, Longo, Haggard & Treasure, 2014) the behavioral aspect has not. However, it is important to give attention to the behavioral aspect of BID, since it has a central role in the maintenance of ED symptoms (Legenbauer et al., 2017) The result of body checking is the magnification of perceived imperfections (Mountford, Haase & Waller, 2006) and misinterpreting normal fluctuations of weight during the day, which both results in body dissatisfaction (Zanetti et al., 2013). This may direct future behavior ("Body checking today showed me I was too fat, therefore I must eat less tomorrow"). In this way, checking behavior might maintain maladaptive behavior. Avoidance behavior might lead to a lack of disconfirmation regarding cognitions of one's body, body shape and perceived imperfections, and in that way, might maintain maladaptive behavior (Shafran, Fairburn, Robinson & Lask, 2004).

It has been suggested that a combination of checking and avoiding behavior might be most problematic (Legenbauer et al., 2017). For example, checking behavior might lead to a high focus on (aspects of) the body that a patient is dissatisfied with and the following avoiding behavior might lead to the lack of disconfirmation of the cognition related to this dissatisfaction (Walker, White & Srinivisan, 2018), which leads to higher dissatisfaction because the maladaptive cognition is not disconfirmed. Therefore, the combination of body checking and body avoidance might result in more BID symptoms.

The assessment of the behavioral component of BID and especially body avoiding behavior has not only been lacking in quantity but also in quality. It has been hypothesized that poor quality of the measures might be the cause of the lack of attention for body checking and avoidance behavior (Legenbauer et al., 2017). For body checking, an accurate measure already exists, the Body Checking Questionnaire (BCQ) (Reas et al., 2002). For body avoiding, the Body Image Avoidance Questionnaire (BIAQ) (Rosen, Srebnik, Saltzberg & Wendt, 1991) has been the most frequently used questionnaire. However, this instrument has some shortcomings as explained by Legenbauer and colleagues (2017). The BIAQ is not just a measure of body avoidance, as in avoiding social situations where one's body would be "on display". The BIAQ measures other concepts too, for example food restriction, body activity or whether someone puts makeup on. Some of these items have been found to correlate very strongly with measures of EDs (Legenbauer et al., 2017), so these concepts might diverse from the real goal of the BIAQ.

These shortcomings have been addressed by the development of the Body Checking and Avoidance Questionnaire (BCAQ) (Legenbauer et al., 2017). The aim was to develop a measure that can assess the complete concept of the behavioral component of BID. The BCAQ has been developed and validated in German and English, but not yet in Dutch. The validation of the Dutch translation of the BCAQ is the main target of the research project this

study is part of. This study focusses on the internal structure of the BCAQ and is a first step to validate this measure. Future studies within the same research project focus on the external validity of the BCAQ and compare it to measurements regarding different body checking- and avoidance behavior, eating pathology, and anxiety-related measures.

The current study aims to address the research question: What is the internal structure of the BCAQ? The hypotheses for this study are 1). As initially suggested by Legenbauer et al. (2017) a two-factor solution, i.e. checking and avoiding, is the optimal factorial structure for the BCAQ. 2) As found by Legenbauer et al. the different factors of the BCAQ, as well as the total scale, are internally reliable. 3). Connecting the studies of Walker, et al. (2018) and Legenbauer et al. it is hypothesized that the different factors of the BCAQ correlate.

2. Methods

This study was part of a larger research project that aims to assess the psychometric qualities of the Dutch translation of the Body Checking and Avoidance Questionnaire (BCAQ). Multiple other measures were used during this research project. However, for the sake of clarity, only the relevant measures for the current study are described below. For more information about the larger study, you can contact the author.

2.1 Participants

A sample of 86 female students was recruited via multiple ways. Of those 86 participants, 17 were removed for multiple reasons, see "Results". One way was recruiting via an internal website of Utrecht University, via which female students could participate in this study for mandatory credit. Other ways were recruiting via multiple sources of social media. To be eligible for participation in this study, participants had to be female, aged between 18 and 25 years, and studying at an institute for higher professional education or a university. Participants had to be female because certain questions could only be answered by females.

The age group of between 18 and 25 years was chosen because most disordered eating takes place in early adulthood, and the importance that is put on body image is the highest in early adulthood (Tiggemann, 2004). Participants who were recruited via the internal website of Utrecht University were awarded with 1 hour of mandatory credit. For descriptive information about the participants, see table 1.

Table 1

Demographic data

	N
Level of education	
Psychology at university	42
Other study at university	7
Higher professional education	20
Psychotherapeutic or psychopharmacological treatment in the past year	
Yes, psychotherapeutic	10
Yes, psychopharmacological	1
No	58
Any DSM-5 diagnosis former year	
Yes	5
No	64
Current or former eating problems	
Yes, with diagnosis	1
Yes, without diagnosis	16
No	52

2.2 Body Checking and Avoidance Questionnaire (BCAQ)

A Dutch translation of the Body Checking and Avoidance Questionnaire (BCAQ) (Legenbauer et al., 2017) was administrated. For more information about the translation see

"Procedure". The BCAQ aims to measure body-related checking and avoidance behaviors. It consists of thirty items that should be rated on a 4-point Likert scale reflecting "does not apply'', "somewhat applies", "mostly applies", and "completely applies". The BCAQ was constructed with the idea of measuring two factors: body checking behavior and body avoidance behavior (Legenbauer et al., 2017). An exemplary item for body checking behavior is: "I touch certain body parts, like my belly or my hips". An exemplary item for body avoidance behavior is: "Also in the summer, I wear clothes that cover my entire body". Factor-analytic research showed that the English version of the BCAQ consists of three subscales. Three items were deleted for this analysis for multiple reasons. After deletion this resulted in a "checking" factor which consists of twelve items, an "avoidance" factor which consists of twelve items and a "reassurance seeking" factor which consists of three items (Legenbauer et al., 2017). These subscales have been found to be internally reliable, with Chronbach's alphas of $\alpha = .92$ for "avoidance behavior", $\alpha = .92$ for "checking behavior" and $\alpha = .79$ for "reassurance seeking". The BCAQ has been found to be able to discriminate between healthy controls and ED patients for checking behavior and avoidance behavior. However, this was not found for reassurance seeking (Legenbauer et al., 2017). For further details with respect to the psychometric quality of the English version of the BCAQ, please see Legenbauer et al. (2017).

2.3 Procedure

2.3.1 Procedure of translation

The translation of the English version of the BCAQ has been done by LS & JB. The English BCAQ was used for the translation, this version has thirty items as opposed to the German BCAQ which consists of 27 items. Items 4, 15 and 22 and have been added to the English BCAQ, and thus to the Dutch translation. The items were first translated from English to Dutch, then back from Dutch to English again to check for deviances, which were then

resolved. The resulting translation was checked with both the English and original German version of the BCAQ by a third independent researcher, LG. Minor issues were discussed and resolved. This resulted in a Dutch, 30-item BCAQ. For one item the content of the item was changed during the translation. This was item 18. For the English BCAQ it states "I compare my appearance with women from magazines or from the TV." The item is changed into "I compare my appearance with women from magazines, TV and other sources of social media." For the result of the translation, see Appendix.

2.3.2 Procedure of data retrieving

Participants could get access to the online questionnaire by opening a hyperlink on their own device. The questionnaire could be answered on a laptop, tablet, smartphone or computer, at a time that was convenient for the participant. It took participants between 25 and 45 minutes to finish the questionnaire. The participant was first shown an information letter and a consent form. After the participant gave consent, a demographic questionnaire was presented, which asked about sex, age, level of education, psychotherapeutic or psychopharmacological treatment in the past year, psychopathology in the past year, and current or former problems with eating. The BCAQ was then presented to participants, along with multiple other questionnaires. These were presented in random order with the aim of avoiding the effects of boredom, tiredness that might arise during the last measures or other problems that might arise when presenting a questionnaire in a specific sequence. After the data collection was stopped, the results were then exported from Qualtrics (2020) to SPSS (IBM Corporations, 2016).

2.4 Data analysis

Data collection was stopped on the 8th of July. The survey was conducted via Qualtrics (2020). The analysis was done via IBM SPSS Statistics 24.0 (IBM Corporations, 2016)

To test the hypotheses, the internal structure of the BCAQ was studied. This was done in multiple ways. First, to test the hypothesis that the BCAQ consists of a two-factor structure, a Principal Component Analysis (PCA) was performed. Before the PCA was carried out, certain assumptions must have been met (Field, 2013). Missing item scores are problematic when performing a PCA. If there was missing data, listwise deletion was applied. Outliers are also problematic when performing a PCA, so there was an examination of the outliers. Outliers were examined per item for typing errors. Afterwards sum scores were calculated for every participant. A score of more than three standard deviations above the mean was seen as an outlier, and if that was the case, the content of the scores were examined. If there was an indication this participant filled in extreme scores because of boredom or lack of interest, this participant was deleted from the analysis. If this was not the case and the outlier was merely statistical, this participant was not deleted from the analysis. In PCA it is essential to have variables that correlate with each other and that contain variance (Field, 2013). To test this, Bartlett's test of sphericity was carried out. Bartlett's test applies a correlation matrix to the dataset and checks whether there is a correlation between item scores (Field, 2013). When there is no correlation between item scores, no factors can be identified, thus making a PCA useless. The cut-off score for Bartlett's test was < .1. Besides Bartlett's test, the Kaiser-Meyer-Olkin measure (KMO) for sampling adequacy was applied. The KMO indicates how much of the variance measured in the variables is the result of underlying factors. The value of the KMO should be above .5 (Field, 2013). If these assumptions were met, a PCA was carried out.

After the PCA, to test the second hypothesis that the factors resulting from the PCA were internally reliable, a reliability analysis was carried out for the separate factors and the BCAQ as a whole. Cut-off scores were $> \alpha = 0.70$ for the factors and $> \alpha = .80$ for the BCAQ as a whole.

To test the third hypothesis that the factors will correlate, a bivariate Pearson correlation analysis between the different factors was applied with a cut-off score of $p < .01$.

3. Results

First, the data were prepared to be analysed. In total, $N = 86$ participants filled in the questionnaire. Of those, fifteen participants did not fill in the entire questionnaire, one participant stated she was not following an educational programme, and one participant did not fill in the consent form, and thus had not given explicit consent. Those participants have been excluded from the analysis, which resulted in $N = 69$ participants. Thereafter an outlier analysis was done in two ways. Scores on all individual items were checked for outliers, to see if there were any typing errors. This was not the case. Then, sum scores were checked for outliers. This showed that one participant scored more than three standard deviations above the mean sum score. There was, however, nothing in this participant's responses on the items that suggested that this was more than a statistical outlier. The scores from this participant resulted in more scatter in the data and may, given their (sub)clinical level, be of actual interest. Therefore, data from this participant has not been excluded from the analysis. Lastly, item 20 was recoded.

After data preparation, a Principal Component Analysis (PCA) was performed to test the first hypothesis that the BCAQ consists of two factors, i.e., checking and avoidance. To assess whether the data were appropriate for PCA, two assumptions were checked. First, to test whether there are correlations between the different items necessary for a PCA, Bartlett's test for sphericity was applied. This showed $\chi^2(435)= 1147,15$, $p < .001$, which is significant. This assumption has been met. Second, to test whether the sample was adequate for a PCA, the Kaiser-Meyer-Olkin measure (KMO) was applied. This showed KMO = .668, which is above the cut-off score of .500 (Field, 2013). Afterwards the KMO-values of the anti-matrices were examined, which showed that two items scored below the cut-off score, namely item 20,

KMO = .302 and item 24 with KMO = .406. However, since 28 out of 30 items scored above the cut-off score and the KMO measure is above the cut-off score, this assumption was interpreted as being met.

Then, analogue to Legenbauer and colleagues (2017), a PCA with varimax rotation, which is an orthogonal rotation, was performed. To see what factorial structure would be best fitting the data, the Kaiser-Gutmann criterion combined with a scree plot was used, as suggested by Williams, Onsman and Brown (2010). This analysis identified nine factors with an eigenvalue greater than 1. According to the scree plot in Figure 1, a solution with 3 factors is the most applicable. This three-factor model explains 44.38% of the variance. The hypothesis that a two-factor structure would be best fitting the data has been rejected.

Figure 1

Scree plot of the eigenvalues from the PCA with varimax rotation.
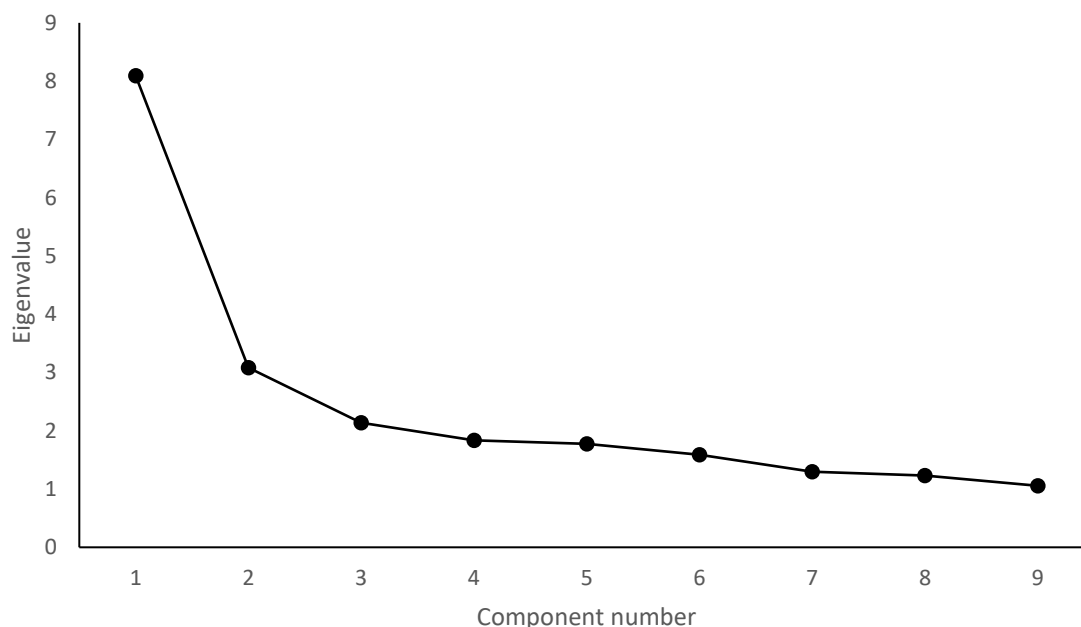
The factors resulting from the PCA had to be clearly identified, see table 2. Some items had a factor loading higher than .40 on multiple factors (i.e., items 2, 4, and 9). These items were placed with the factor for which the item had the highest factor loading.

Accordingly, item 2 and 4 were placed under factor 1, and item 9 under factor 3. Also, some items did not have a factor loading higher than 0.40 on any factor (i.e., items 11, 15, and 20). These items were placed with the factor for which the item had the highest factor loading. Accordingly, item 11 was placed under factor 1, and item 15 and item 20 under factor 2.

The result of the PCA was a three-factor solution for which the factors have been called the following: the first factor is "checking", the second factor is "avoiding", and the third factor is "social". These factors were compared to the three factors found by Legenbauer and colleagues (2017). The "checking" factor, with 12 items, that was found in the current study was nearly identical to the "checking" factor that was found by Legenbauer et al. with only two deviations. In the current study, item 4 "I only look at myself in the mirror in certain positions." loaded on the "checking" factor, while this item was eliminated because of double factor loading by Legenbauer et al. Item 9 "I measure the size of my thighs with my hands or with a measuring tape." loaded on the "social" factor in the current study and loaded on the "checking" factor in Legenbauer et al.

The second factor in the current study, the "avoiding" factor was found consisting of eleven items, compared to twelve items in the study by Legenbauer and colleagues (2017). Item 10 "In sexual contact with a partner, I only adopt certain positions." loaded on the "social" factor in this study, while it loaded on the "avoiding" factor in Legenbauer et al. In the current study item 15 "When I'm sitting, I tense my thighs so that my legs are not resting completely on the chair." loaded on the "avoiding" factor, while this item was eliminated because of double factor loading by Legenbauer et al. Lastly item 24 "I only have sex in the dark." loaded on the "social" factor in this study, while it loaded on the "avoiding" factor in the Legenbauer et al. study.

Finally, seven items loaded on the third factor, the "social" factor. It was named the "social" factor, because six out of these seven items were related to social situations, wherein

a social component could be essential in guiding one's behavior. This factor has some overlap with the "reassurance seeking" factor that was found by Legenbauer and colleagues (2017). However, more items loaded on the "social" factor compared to the "reassurance seeking" factor. As mentioned items 9, 10 and 24 were placed elsewhere. Item 22 "I never leave the house without make-up." loaded on the "social" factor in this study and was excluded from Legenbauer et al. based on the scree plot. For an overview of the differences on the item placement compared to Legenbauer et al. see table 3.

The mean score for the total BCAQ was 46.35 with a standard deviation of 11.41. The mean of factor 1 is 20.80 with a standard deviation of 5.94. Factor 2 has a mean of 16.14 with a standard deviation of 5.28. Lastly, factor 3 has a mean of 10.84 and a standard deviation of 3.49. For an overview, see table 4.

To test the second hypothesis that the factors are internally reliable, a reliability analysis was run. This reliability analysis resulted in the following. Factor 1 consists of 12 items with Cronbach's $\alpha = .846$ and would be $\alpha = .849$ if item 11 "I pinch my skin together and measure the size of the folds." would be deleted. Factor 2 consists of 11 items with Cronbach's $\alpha = .843$. Cronbach's alpha would be higher, $\alpha = .858$, if item 20 "I like being massaged and enjoy the physical contact." would be deleted. Factor 3 consists of 7 items with Cronbach's $\alpha = .764$. For the BCAQ as a whole Cronbach's $\alpha = .894$ and would be $\alpha = .898$ if item 20 would be deleted and $\alpha = .895$ if item 11 would be deleted. Together, the factors of the BCAQ and the total scale are internally reliable according to the guidelines by Tavakol and Dennick (2011). The Cronbach's alpha of the subscales and the total scale fall between the guideline of between an alpha of .75 and .9 which means that the second hypothesis that the factors of the BCAQ and the total scale are internally reliable has been accepted.

To test the third hypothesis that the factors of the BCAQ correlate, a bivariate Pearson correlation analysis has been applied. In table 5, the result of this analysis is presented. This

table shows that all relationships between factors are significant, p's < .000. According to the guidelines by Cohen (1988), the effect sizes of the correlation between the different factors are all medium.

Table 2

Eigenvalues, % of variance explained, and factor loadings for PCA for a varimax rotation with the selected three-factor model.

	Factor 1	Factor 2	Factor 3
Eigenvalues	8.092	3.085	2.138
% of variance explained	26,97 %	10,28 %	7,13 %
Item 1		.758	
Item 2	**.483**		.421
Item 3		.618	
Item 4	**.456**	.414	
Item 5	.605		
Item 6	.621		
Item 7		.509	
Item 8			.657
Item 9	.462		**.551**
Item 10			.542
Item 11	**.275**		.269
Item 12		.616	
Item 13		.736	
Item 14	.542		
Item 15	.333	**.339**	
Item 16	.658		
Item 17		.635	
Item 18	.660		
Item 19		.736	
Item 20		.215	
Item 21	.722		

Item 22			.484
Item 23			.707
Item 24			.547
Item 25			.718
Item 26		.709	
Item 27	.582		
Item 28	.514		
Item 29		.610	
Item 30	.705		

Notes: Items that had a factor loading of above .40 are included in the table. When an item did not have a factor loading > .40 , the highest factor loading is included in the model. When an item had multiple factor loadings > .40, the item was placed under the factor for which it had the highest factor loading. When an item is mentioned under two or more factors, the factor loading that is put in bold is included in the model.

Table 3

The differences of the placement within factors between the current study and the Legenbauer

et al. (2017) study.

Item	Placement in current study	Placement in Legenbauer et al. (2017) study
Item 4 "I only look at myself in the mirror in certain positions."	Checking	Eliminated because of double factor loading
Item 9 "I measure the size of my thighs with my hands or with a measuring tape."	Social	Checking
Item 10 "In sexual contact with a partner, I only adopt certain positions."	Social	Avoiding
Item 15 "When I'm sitting, I tense my thighs so that my legs are not resting completely on the chair."	Avoiding	Eliminated because of double factor loading
Item 22 "I never leave the house without make-up."	Social	Eliminated based on the scree plot
Item 24 "I only have sex in the dark."	Social	Avoiding

Table 4

Mean and standard deviation of the BCAQ total score, and the BCAQ factor scores.

	BCAQ total scale	Factor 1	Factor 2	Factor 3
Mean	46.35	20.80	16.14	10.84
Standard deviation	11.41	5.94	5.28	3.49

Table 5

Correlations between the three factors.

Factor	1	2	3
1	-	.459**	.474**
2		-	.369**

*Note: ** Correlation is significant at the 0.01 level (2-tailed).*

4. Discussion

This study aimed to test the factorial structure, internal reliability, and the relationship between the factors of the Dutch version of the BCAQ. By doing a PCA, this study found that a three-factor structure, consisting of a "checking" factor, an "avoidance" factor, and a "social" factor, best fitted the data, which results in the rejection of the first hypothesis which states that a two-factor model would be the best fit for this data. In line with the second hypothesis, it was found that all three factors, as well as the BCAQ total scale, are internally reliable according to the cut-off scores by Tavakol and Dennick (2011). The third hypothesis was also confirmed, it was found that the three factors of the BCAQ correlate.

Although the first hypothesis was rejected, it is partially in accordance with the study by Legenbauer and colleagues (2017). However, whereas the study by Legenbauer and colleagues found clear "avoiding", "checking" and "reassurance seeking" factors, in the current study, the "avoiding" factor is less clear, and a more extensive "social" factor was found in comparison to the "reassurance seeking" factor.

This study seems to confirm the finding that the BCAQ consists of three factors (Legenbauer et al., 2017) However, whereas body avoiding and body checking are considered core components of ED's, found in multiple studies (Nikodijevic, 2018), this is not the case for what is called the "social" factor. As to the reason why this study found a more prominent

third factor, an explanation could be that the "social" factor might reflect a third component within the behavioral component of BID. However it could also be a distinct aspect like social physique anxiety (Fitzsimmons-Craft, Harney, Brownstone, Higgins & Bardone-Cone, 2012). Aspects like body checking and avoidance are also often seen in social physique anxiety and it also relates to EDs (Fitzsimmons-Craft et al., 2012). Further research into the BCAQ could show whether the "social" factor could be best described within a BID spectrum or a closely related aspect.

In line with the third hypothesis, it was found that the factors of the BCAQ correlate with each other. The effect size, according to Cohen (1988), of all the correlations between the different factors is medium. Underlying this correlation might be a latent construct, as this questionnaire was intended to measure the behavioral component of body image. The three factors as found in this study could be indicators of this construct, and in that way would logically correlate. This would suggest that "avoiding", "checking", and "social" behavior do not happen independent of each other, or influence each other, but are merely measurable indicators of an underlying variable.

It is worth mentioning that, in the current study, item 20 "I like being massaged and enjoy the physical contact." seemed to be problematic. This item loaded on neither of the three factors and this resulted a less reliable "avoiding" factor and total BCAQ scale. This might be the case because this item may be less about BID and more about body image self-consciousness, which is more closely related to body dissatisfaction and is much more common in the general population then BID is (Wiederman, 2000). Thus, the aspect of enjoying physical contact could be somewhat unrelated to body checking- and body avoidance behavior and the social factor as found in this study, and because of that, does not fit well in the model. Because this study was not intended to eliminate items that do not fit in

well, this item will be kept in the Dutch version of the BCAQ, but future research should look critically at this item.

This study has some limitations. Most important, a PCA was performed on data with N= 69 participants. As stated in Williams, Onsman, and Brown (2010) for the number of participants for a PCA, different rules of thumb have been brought up, but 100 participants seems to be the bare minimum for a PCA to be successful. Field (2013) even stated 300 participants to be the minimum for factor analytic research. However according to MacCallum, Widaman, Zhang, and Hong (1999), the minimum number of participants needed might be lower when the number of factors is low and every factor has multiple indicators, as is the case in this study. Although the number of participants is limited and may have affected the results, some conclusions can be drawn, with caution. While further validating the Dutch version of the BCAQ, more participants will be one of the crucial elements. This study also has some strengths. Most importantly, the process of translation was thorough. Multiple researchers worked independently of each other on translating the BCAQ. This was not only done by translating the English version but was also re-examined by another researcher using the German version. This extensive process resulted in a solid translation.

The current study was a first step in validating the Dutch version of the BCAQ. This study, however, only looks at aspects of the internal structure of the Dutch BCAQ. First, to be surer about the internal structure, more participants must be included to be able to perform the statistical analysis with more certainty. Second, to be able to state something about the reliability over time, a test-retest study will have to be done (Neuman, 2006). Third, to be able to make statements about the external validity, the BCAQ will have to be compared to measurements of multiple other, distinct though related, constructs. This could be different behavioral body image measures, for example, the Body Image Avoidance Questionnaire (Rosen, Srebnik, Saltzberg, & Wendt, 1991) and Body Checking Questionnaire (Reas,

Whisenhunt, Netemeyer, & Williamson, 2002), eating disorder measures (van Strien & Ouwens, 2003; Fairburn & Beglin, 1994). Comparing the results of the BCAQ with other measures will give a view of how the BCAQ relates to those measures. Fourth, this study consists healthy female college students. To validate this measure, ED patient groups will also have to participate in future studies.

In conclusion, the internal structure of the Dutch version of the BCAQ seems to be very comparable to the English version. This study shows that a three-factor model is the best fit for this data, in disagreement with the hypothesis but in agreement with earlier research (Legenbauer et al., 2017). In addition, this study showed that the factors are internally reliable and correlate with each other. Further validating this measure will give psychologists and other health care practitioners an instrument to measure the behavioral component of body image. This measure incorporates the behavioral component of body image and because this is such central aspect in EDs, a better way of measuring this concept might lead to more attention, which in turn could improve treatment options for patients with EDs. Concern with body image is one of the central themes in cognitive behavioral therapy for EDs (NICE, 2017), and considering the role of body checking and body avoiding in BID, a solid measure for the behavioral component is important for diagnostics and treatment. Considering the low rate of full recovery (46,9%) and high mortality rates (5%) (Steinhausen, 2009), improving diagnostics and treatment is highly relevant.

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Appendix

Body Checking and Avoidance Questionnaire (BCAQ)

Geef voor ieder van de onderstaande uitspraken aan in hoeverre de uitspraak voor jou van toepassing is. Besteed niet te veel tijd aan iedere uitspraak, het gaat om je eerste indruk waarbij je zo spontaan mogelijk probeert te reageren. Een aantal uitspraken vraagt naar de relatie met jouw partner. Mocht je geen partner hebben, dan kun je terugdenken aan hoe dit in het verleden voor je was of je proberen voor te stellen dat dit wel het geval is.

		Helemaal niet van toepassing	Een beetje van toepassing	Nogal van toepassing	Volledig van toepassing
1.	Ik vermijd plekken zoals recreatiemeren en stranden.	1	2	3	4
2.	Ik controleer of ik mijn polsen en enkels met één hand kan omvatten.	1	2	3	4
3.	Ik draag alleen donkere, bedekkende kleding of sjaals, om de aandacht van mijn figuur af te leiden.	1	2	3	4
4.	Ik bekijk mijzelf alleen in de spiegel vanuit bepaalde houdingen.	1	2	3	4
5.	Ik raak bepaalde lichaamsdelen aan, zoals mijn buik of mijn heupen.	1	2	3	4
6.	Met bepaalde lichaamsbewegingen controleer ik of mijn vet heen en weer beweegt.	1	2	3	4
7.	Ik laat mijzelf niet naakt zien aan anderen, zoals mijn partner, mijn familie of zelfs bij de dokter of in het ziekenhuis.	1	2	3	4

8.	Ik vraag mijn partner of een vriendin hoe aantrekkelijk hij of zij mij vindt.	1	2	3	4
9.	Ik meet de omvang van mijn bovenbeen met mijn handen of met een meetlint.	1	2	3	4
10.	Bij intiem contact met een partner, neem ik slechts bepaalde houdingen aan.	1	2	3	4
11.	Ik knijp mijn huid samen en meet zo de grootte van de plooien.	1	2	3	4
12.	Ik draag geen kleding waarin mijn vrouwelijke vormen uitkomen, zoals een spijkerbroek of een strakke top.	1	2	3	4
13.	Ik vermijd gemeenschappelijke douches, sauna's, zwembaden of spa's.	1	2	3	4
14.	Ik trek mijn buik in om te zien hoe het zou zijn als deze helemaal plat was.	1	1	3	4
15	Als ik zit, span ik mijn bovenbenen aan zodat mijn benen niet volledig op de stoel rusten.	1	2	3	4
16.	Als ik loop, check ik of mijn benen elkaar raken.	1	2	3	4
17.	Ik draag geen korte kleding bij het sporten.	1	2	3	4
18.	Ik vergelijk mijn uiterlijk met vrouwen uit tijdschriften, tv en andere bronnen van sociale media.	1	2	3	4

19.	Ook in de zomer draag ik kleding die mijn hele lichaam bedekt.	1	2	3	4
20.	Ik vind het prettig om gemasseerd te worden en geniet van het lichamelijke contact.	1	2	3	4
21.	In de spiegel controleer ik of mijn botten zichtbaar zijn.	1	2	3	4
22.	Ik ga nooit het huis uit zonder make-up.	1	2	3	4
23.	Ik vraag mijn partner of vrienden, of ik aangekomen ben of weer een dieet zou moeten volgen.	1	2	3	4
24.	Seks heb ik altijd in het donker.	1	2	3	4
25.	Ik vraag mijn partner of ik er in bepaalde kleding dik uitzie.	1	2	3	4
26.	Ik vermijd intiem lichamelijk contact met anderen.	1	2	3	4
27.	Als ik zit, controleer ik of ik cellulitis op mijn dijen heb.	1	2	3	4
28.	Ik omvat mijn bovenarm om de omtrek ervan te meten.	1	2	3	4
29.	Als ik shop, kom ik niet uit het pashokje in de nieuwe kleding, om mijzelf in het openbaar in de spiegel te bekijken.	1	2	3	4
30.	Ik controleer in de spiegel of mijn bovenbenen elkaar raken, als ik rechtop sta.	1	2	3	4