King's Research Portal

DOI:

[10.1017/S1352465819000614](https://doi.org/10.1017/S1352465819000614)

Document Version

Peer reviewed version

[Link to publication record in King's Research Portal](#)

Citation for published version (APA):

Jordan, C., Vitoratou, S., Siew, Y., & Chalder, T. (2020). Cognitive behavioural responses to envy: development of a new measure. *Behavioural and Cognitive Psychotherapy*, 48(4), 408-418.
<https://doi.org/10.1017/S1352465819000614>

Citing this paper

Please note that where the full-text provided on King's Research Portal is the Author Accepted Manuscript or Post-Print version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version for pagination, volume/issue, and date of publication details. And where the final published version is provided on the Research Portal, if citing you are again advised to check the publisher's website for any subsequent corrections.

General rights

Copyright and moral rights for the publications made accessible in the Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognize and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the Research Portal

Take down policy

If you believe that this document breaches copyright please contact librarypure@kcl.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.

Cognitive behavioural responses to envy: development of a new measure.

Cheryl Jordan ^{a*}, Silia Vitoratou ^b, Yee Siew ^c, Trudie Chalder ^c.

*Corresponding author

^a Faculty of Nursing and Midwifery, Kings College London, 57 Waterloo Road, London SE1 8WA. 020 7848 3285

^b Department of Biostatistics, Institute of Psychiatry, Psychology and Neuroscience, King's College London, 16 De Crespigny Park, London SE5 8AF.

^c Department of Psychological Medicine, Institute of Psychiatry, Psychology and Neuroscience, King's College London, Weston Education Centre, Cutcombe Road, London SE5 9RJ.

Running header: C-BRES: a new measure of envy

The authors have abided by the Ethical Principles of Psychologists and Code of Conduct as set out by the APA. Ethical approval for this study was granted by King's College London- PNM/11/12-66.

Cheryl Jordan ^{a*}, Silia Vitoratou ^b, Yee Siew ^c, Trudie Chalder ^c have no conflict of interest with respect to this publication.

This research received no specific grant from any funding agency, commercial or not-for-profit sectors

Declaration of interest: SV and TC were funded by the National Institute for Health Research (NIHR) Biomedical Research Centre at South London and Maudsley NHS Foundation Trust and King's College London. The views expressed in this article are those of the authors and not necessarily those of the NIHR or the NHS.

Word count: 4942

Cognitive behavioural responses to envy: Development of a new measure.

Journal:	<i>Behavioural and Cognitive Psychotherapy</i>
Manuscript ID	BCP-01665-19.R1
Manuscript Type:	Main
Keywords:	Envy, Malicious, Psychometric, Cognitive, Emotional, Behavioural

SCHOLARONE™
Manuscripts

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Abstract

Background: Envy is depicted as motivating destructive desires and actions intended to spoil or destroy that which is envied.

Aim: To develop a new valid and reliable measure of malicious envy (C-BRES) which included items which represented the cognitive, emotional and behavioural responses empirically associated with this emotion.

Method: A total of 203 adults completed the new 22 item cognitive and behavioural responses to envy scale (C-BRES). Exploratory factor analysis was carried out to test for reliability and internal consistency of the C-BRES. Evidence towards the concurrent construct validity (convergent and discriminant) of the C-BRES was assessed through correlations with the Dispositional envy scale and other measures of psycho-social outcomes empirically linked to envy.

Results: Factor analysis for categorical data identified 5 dimensions of envy, namely: injustice, hostility, malicious action tendencies, malicious feelings and behavioural responses. The reliability indices of the five factors and the total scale were satisfactory (>0.85). Evidence towards the concurrent construct validity (convergent and discriminant) of the C-BRES is reported. In particular envy was associated with higher levels of depression, psychoticism, neuroticism, anger and lower levels of self-esteem and quality of life.

Conclusion: All findings support the psychometric adequacy of the C-BRES.

Keywords: Envy, malicious, psychometric, cognitive, emotional, behavioural

C-BRES: a new measure of envy

1. Introduction

Envy has been described throughout history as a potent cause of human unhappiness and is associated with a range of negative mental health outcomes such as low self-esteem, decreased life satisfaction (Krasnova et al, 2013) and a greater tendency to depression (Smith et al, 1999). This uniquely unpleasant emotional experience is thought to be provoked when a person perceives that they lack another's superior quality, achievement or possession and either desires it or wishes the other lacked it (Parrott et al, 1993).

Historically empirical evidence has suggested that there are two principle affective components integral to the experience of envy: hostility and depressive feelings (Taciano et al, 2009). When a person feels envious, they are likely to believe that the envied other benefits from an underserved advantage in an area important to their own goals (Smith, et al 2007, Van de Ven et al, 2012). The inequality of the situation is perceived as unjust motivating feelings of ill will and hostility in the reaction of the envier (Smith et al, 1994). Depressive feelings in contrast have been linked to an unfavourable social comparison which culminates in thoughts of failure and inferiority (Smith et al, 1994). Empirical studies have conceptualised the emotional experience of shame as stemming from similar negative self-appraisals. Dryden (1994) suggests that shame often serves as a meta emotion which occurs when a person supposes that an emotional experience constitutes a weakness and then feels ashamed of it. Multiple studies have identified that people are often reluctant to admit to feeling envy and try to conceal it (Silver et al 1978). The experience of feeling ashamed of feeling envious may offer some explanation for this and indicate that shame is frequently experienced alongside envy.

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

50 Contemporary research has identified a further affective component to this emotion;
51 an increase in motivation to move up to gain the desired attribute. Several studies
52 have found that this distinct dimension of envy is associated with heightened
53 performance (Lange et al, 2015) and an increase in personal effort to obtain the
54 desired object (Schaubroeck et al, 2004, Van de Ven et al, 2012, Crusius et al, 2012,
55 2015).

56
57 These varying dimensions of envy are clearly connected to distinct cognitive and
58 behavioural responses which can be broadly categorised into either malicious or
59 benign versions of this emotion. Many recent research studies support this
60 distinction with malicious envy being characterised by thoughts and behaviour
61 aimed at dragging the envied other down whilst in contrast benign envy promotes
62 motivation to move up to gain the envied attribute (Van de Ven et al, 2012). The
63 nature of malicious envy shows some similarity to unhealthy anger in that both
64 emotions are associated with thoughts of injustice and aggressive behaviour. It
65 seems logical that the experience of malicious envy may lead to unhealthy anger as
66 the individual recognises that they do not have that which they desire and attributes
67 this to an unfair distribution of advantage or privilege.

68
69 Most scales that have been introduced to measure envy have focused on historical
70 conceptualisations of malicious envy and have been designed to assess an
71 individual's predisposition to experiencing it (Smith et al, 1999, Gold et al, 1996,
72 Lange et al 2015). For example, the disposition envy scale (DES), is an 8 item self-
73 report measure which focuses on thoughts about inadequacy, unfairness and the
74 success of others (Smith et al, 1999). It correlates with negative psychological

C-BRES: a new measure of envy

outcomes such as low self-esteem, depression, neuroticism and resentment. The York enviousness scale focuses on the emotional facets of resentment and ill will and is linked to higher levels of anger and hostility (Gold et al, 1996). In contrast, the recently developed benign malicious envy scale (BeMaS) contains items relating to the appraisals and emotional aspects of both types of envy. The five Items which are indicative of benign envy are centred on thoughts of increasing personal effort to obtain the envied object or attribute and show's an association with increased inspiration and hopefulness for the future. The five Items suggestive of malicious envy concentrate on feelings of ill will towards the envied person and a wish to see them fail and is linked to an increased fear of personal failure (Lange et al, 2015).

In order to measure malicious envy each of these scales has focused on a differing and narrow range of cognitions and emotions indicative of this emotional experience. There is a notable absence of items relating to the antisocial motivations and behaviours empirically linked to and often included in theoretical definitions of this emotion (Delpriore et al, 2012). Within the workplace several studies have observed behaviours which include employees spreading malicious rumours, providing misinformation and verbally disparaging their rival to colleagues, all with the sole intention of harming their envied colleagues reputation or performance (Vecchio et al, 2000, Cohen-Charash et al, 2009).

While aggressive envy-related behaviour is frequently identified in the empirical literature two studies have also identified a tendency for malicious envy to demotivate behaviour. One study found avoidance or withdrawal from the envy

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

provoking situation to be a commonly reported behavioural response (Jordan et al 2013), whilst the other noted a decrease in goal directed behaviour (Lange et al, 2015).

The absence of items relating to these core behavioural tendencies of malicious envy on contemporary measures may have important implications for effective measurement and understanding of this emotion. Over the last 200 years, researchers from Charles Darwin (1872) to Richard Lazarus (1991) have proposed models of emotion which recognise that affective states have distinguishable and consistent motivational dynamics (Lang et al, 1995). The ability to distinguish, measure and correlate the emotional experience of malicious envy may therefore be improved by a scale which contains items which capture its core cognitive and behavioural responses.

The aim of this paper was to develop a new valid and reliable measure of malicious envy (C-BRES) which included items which represented the cognitive, emotional and behavioural responses empirically associated with this emotion (Van De Ven, 2012). Our approach involved generating a set of candidate items based on the findings of a qualitative questionnaire study previously carried out by the authors (Jordan et al, 2013), in combination with a review of the wider literature.

The goals of this study were to assess a) which of the items from the initial pool should be retained b) the factor structure of the C-BRES and c) the concurrent construct validity (convergent and discriminant) of the C-BRES.

C-BRES: a new measure of envy

125 We hypothesised that (1) the Cognitive – Behavioural responses to envy scale (C-
126 BRES) would have good reliability and internal consistency (2) the C-BRES scores
127 would be correlated with the dispositional envy scale scores (3) high C-BRES scores
128 would be associated with high levels of depression, neuroticism, psychoticism,
129 anger, and low levels of self-esteem and a reduced quality of life.

2. Materials and methods

2.1 Design of the scale

133 Firstly, we generated a set of candidate items based on the findings of a previous
134 study conducted by the authors (Jordan et al, 2013). This study explored the lived
135 experience of malicious envy from the enviers' perspective and provided detailed
136 information on the specific cognitive, emotional and behavioural components of this
137 dimension of envy as reported by 50 participants. These included perceived
138 unfairness, inferiority and sense of loss/failure as well as hostile thoughts, harming
139 behaviours, verbal disparagement and avoidance.

141 Between one and three items were created for each category and were phrased as a
142 behaviour or thinking a person might experience when feeling envious. For
143 example, the category of perceived inferiority was tapped by item 17 "I feel inferior
144 to others when they have something I want". Item 10 (I try to mix with people who
145 have the life I want) was reversed to break tendencies towards a response set.

147 The reluctance of people to admit to feeling envy was addressed by items designed
148 to assess solely the thoughts and behaviour which reflect envy. For example, item

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

149   5 “I feel bad about myself because I don’t have the attributes or talents of others”.
150   As such, the word “envy” was avoided.
151
152   Responses for this measure rated the extent to which it accurately described the
153   individual’s thoughts and behaviours toward the object or person. Items were rated
154   on a 6-point Likert scale, ranging from 0 (totally disagree) to 5 (totally agree), a
155   higher score being indicative of a greater level of envy. The initial pool of items is
156   presented in Appendix 1.

2.2 Participants and procedure

159   A sample of 203 people participated, recruited through a circular email to the staff
160   and students of a London based university, a social networking site and an
161   advertisement placed on the notice board of a hostel in London, UK. Concurrently
162   with the C-BRES, the participants were asked to complete either on-line or in a pen-
163   and-paper format the *Dispositional Envy Scale* (DES; Smith et al., 1999), the *Centre*
164   *for Epidemiological studies Depression scale* (CES-D; Radloff, 1977), the *Novaco*
165   *Anger Scale* (NAS; Novaco, 1994), the *Quality of Life Activity Inventory* (QoL-AI;
166   Albert et al, 1996), and Eysenck personality inventory (EPQ; Eysenck et al, 1985)
167   and the *Iowa-Netherlands Comparison Orientation Measure* (Gibbons et al, 1999).
168   These measures were selected for evaluating the validity of C-BRES, as they were
169   justified in the literature to have a theoretical or empirical link to envy. Ethical
170   approval for this study was granted by King’s College London- PNM/11/12-66.

2.3 Analysis

Exploratory factor analysis for categorical data (item factor analysis) via the weighted least squares estimator (WLSMV; Muthén et al. 1997) was used. Measures of absolute and relative fit were assessed, namely the relative chi-square (relative χ^2 : values close to 2 indicate close fit; Hoelter, 1983), the Root Mean Square Error of Approximation (RMSEA, values less than 0.08 are required for adequate fit and close to 0.05 for close fit; Browne and Cudeck, 1993), the Comparative Fit Index (CFI, values higher than 0.9 are required for close fit; Bentler, 1990) and the Standardized Root Mean Square Residual (SRMR; values less than 0.08 are generally required for a good fit; Hu and Bentler, 1999). Parallel analysis (Horn, 1965) with polychoric correlation matrices was also implemented. For the evaluation of the 6-point rating scale effectiveness, we followed the guidelines of Linacre (2004).

The reliability (internal consistency) of the factors and the total scale was evaluated using Cronbach's (1951) alpha. Evidence towards the concurrent construct validity (convergent and discriminant) of the C-BRES are reported in relation to other measures using non parametric methods, namely the Spearman's correlation coefficient and the Mann-Whitney test.

The reliability and the validity assessment were conducted using the Statistical Package for the Social Sciences (version 22; IBM, 2013). The evaluation of the rating scale was carried out using the Facets software (Linacre, 2015). EFA was conducted in Mplus (Muthén & Muthén, 1988-2011) and parallel analysis was

C-BRES: a new measure of envy

196 carried out using the ‘random.polychor.pa’ *R* package (Presaghi & Desimoni,
197 2014).

198

199 **3. Results**

200 **3.1 Descriptive Characteristics**

201 The demographic characteristics of the final sample are presented in Table 1. No
202 significant differences emerged between genders in any of the demographic
203 characteristics ($p>0.10$ in all cases).

204

205 **About here: Table 1: Demographic characteristics.**

206

207

208 **3.2 Exploratory factor analysis for categorical data**

209 The inspection of the frequencies of the items revealed that the responders tended
210 not to choose the last category (5: “totally agree”). In fact, the absolute frequency
211 of this category did not exceed 5 in any of the items. In order to have sufficient data
212 (per cell) to proceed with item factor analysis the last two categories were merged.

213

214 EFA for categorical items was conducted and four eigenvalues above one (16.2, 2.2,
215 1.5, 1.2) were present. However adequate fit was achieved when the number of
216 factors was increased to five (relative $\chi^2= 1.9$, CFI=0.99, RMSEA=0.068 and
217 SRMR=0.034). The results of this initial analysis were used for item selection. In
218 particular, items that did not load (Geomin rotation) sufficiently in any of the factors
219 (item 27) or had large loadings in more than one factors (items 5, 6, 13 and 24)
220 where considered as problematic. The reliability within the corresponding factor

C-BRES: a new measure of envy

221 along with the face validity was also taken under consideration and the five items
 222 were finally omitted from the scale. The analysis was repeated using the remaining
 223 22 items (see Appendix 2).

224
 225 The one-factor model did not have adequate fit (relative $\chi^2= 5.7$, CFI=0.95,
 226 RMSEA=0.152 and SRMR=0.112), verifying that the scale is not unidimensional.
 227 The first model to provide adequate fit was the 4-factor solution (Table 2). Parallel
 228 analysis using polychoric correlations also indicated a four-factor solution.
 229 However, the loadings matrix reveals that this solution leads to high cross loadings
 230 (results were replicated under Promax rotation as well). In particular the items 7, 8
 231 and 9 which describe malicious action tendencies (thoughts), loaded equally into
 232 two factors. The five factors solution resolves this issue providing a clear structure
 233 where these three items constitute a separate factor. Based on the content of the
 234 statements, the factors were named as *injustice* (IN), *hostility* (H), *behavioural*
 235 *responses* (BR), *malicious feelings* (MF) and *malicious actions tendencies* (MAT).
 236 By omitting the 3 MAT items, the four other factors were replicated in the 19 items
 237 set, verifying that there are five factors pertaining the complete 22 items set (Table
 238 2).

241 **About here: Table 2: EFA for categorical data solutions – Geomin rotated loadings and**
 242 **goodness of fit indices.**

244 3.3 Rating scale evaluation

245 In order to evaluate the 6-point rating scale effectiveness, we followed the
 246 guidelines of Linacre (2004) and we considered the necessity of combining adjacent

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

categories. The initial scaling was found indeed to be suitable as no distorted thresholds were present in any of the factors (please see Linacre, 2004 for details). This is illustrated graphically in Figure 1; the 6 categories smoothly follow the expected order, with lower categories (for instance responses “1”) being placed at lower levels of hostility (to the left) and vice versa. Each category (response option) takes its peak at a point where the probability of this response is higher than all other responses. Therefore, the 6-point rating scale is recommended even if for the needs of the analysis solely, low frequency categories might need to be merged in some samples.

About here: Figure 1: Response options probabilities – Hostility dimension

3.4 Descriptive indices and reliability

Table 3 presents the descriptive indices of the factors and the total score for the total sample and separately for each gender. All scores were skewed to the right which indicates a reluctance for participants to report the most extreme levels of envy and is congruent with previous research indicating people are often reluctant to admit to feeling envy and try to conceal it (Silver at al 1978). Further, envy may need to be present and in operation for the participants to be able recall their most envious thoughts or desires. The internal consistency (reliability) was satisfactory in all cases, even in factors constituted by three items such as H and MAT (Table 3). Males scored higher than females in MAT and BR factors, leading to an increased total score. Age correlated negatively and weakly with the factors and total scores

C-BRES: a new measure of envy

(Table 4). The five factors correlated positively and highly with one another and with the total score (Table 4).

About here: Table 3: Descriptives of C-BRES scores, Cronbach's alpha, and gender comparison.

About here: Table 4: Spearmans's correlation coefficients among C-BRES scores and age.

3.5 Evidence towards validity

Table 5 presents the correlations of the C-BRES scores with the other scales concurrently administered to the participants. Criterion validity is evident since the C-BRES correlated moderately and positively with DES ($r=0.5$ in total score level). Further convergent validity was evident via the satisfactory correlation of the C-BRES scores with the CES-D, NAS and EPQ psychoticism and neuroticism dimensions. On the contrary, CBRES did not correlate with INCOM and EPQ-E providing evidence towards discriminant validity. There was no correlation also between the CBRES scores and the Lie scale ($p>0.1$ in all cases).

About here: Table 5: Spearmans's correlation coefficients between C-BRES scores and other measures.

4. Discussion

We developed a 22-item cognitive behavioural response to envy scale (C-BRES) with sound reliability and validity. Our analysis showed malicious envy to be

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

299 characterised by five dimensions, four illustrating key cognitive responses (thoughts
300 of injustice - IN), hostility (H), maliciousness (MF) and malicious actions (MAT)
301 and one highlighting primarily harming behaviours (BR) (e.g., *I have caused harm*
302 *to someone who has what I want*). The items indicative of these factors possess clear
303 content validity as each has been consistently empirically linked to the experiential
304 content of malicious envy (Smith et al, 1999, Vecchio et al, 2000, Cohen-Charash
305 et al, 2009). The reliability of the scale was satisfactory in all cases, even in factors
306 constituted by three items such as Hostility and Malicious action tendencies.

307

308 A measure of the scale's concurrent validity was obtained through the comparison
309 of participants scores on the C-BRES and DES (Smith et al, 1999). A significant
310 relationship between all five factors of the C-BRES and the DES was identified
311 which suggests that the measures are tapping a common underlying factor.

312

313 The C-BRES for the most part, correlated in empirically compatible ways with
314 psychological measures providing evidence of construct validity. Correlation
315 coefficients point to a strong positive association with depression, anger,
316 psychoticism and neuroticism and a negative association with quality of life (Smith
317 et al 1999, Parrott et al 1993).

318

319 Neuroticism is typified by negative affect and a tendency to interpret ordinary
320 situations in an extreme way. It is consistently linked to a range of negative mental
321 health outcomes. Psychoticism is associated with hostility, being achievement
322 orientated and dogmatic. These personality traits therefore overlap with envy in
323 experiential content and an association between them would be predicted (Eysenck

C-BRES: a new measure of envy

et al, 1976). Envy does not however share any features with extraversion such as being sociable or irresponsible. The absence of a relationship between this sub scale on the EPQ and the C-BRES would be therefore be expected and provides some support for the discriminant validity of the C-BRES (Eysenck et al, 1976).

In contrast to previous studies, no relationship was found between envy as measured by C-BRES and the tendency to make social comparisons. This is unexpected but understandable on closer scrutiny of the items comprising the INCOM (Gibbons et al, 1999). This measure sets out a range of social situations in which comparison might occur, for example considering how someone else might react in a similar situation. According to our results this may not be pertinent to the experience of envy. The absence of a relationship between the C-BRES and INCOM may therefore reflect the ability of the C-BRES to distinguish the specific cognitive and behavioural responses of envying from the process of general social comparison. This may be further evidence of the discriminant validity of this measure (Gibbons et al, 1999).

When examining the relationship with socio-demographic variables and envy, it is apparent that males score higher than females for malicious action tendencies and behavioural responses. Although this may be a consequence of it being more socially acceptable for men than women to admit to and engage in aggressive or hostile behaviours (Burton et al, 2007), it also suggests that envy motivates a different response in men and women. Several studies have previously detected differences in the situations or attributes provoking envy for men and women. It is also possible that gender motivates different action tendencies (Delpriore et al,

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

2012). Age also showed a weak but significant negative association with C-BRES scores suggesting that increasing age was linked to decreasing envy. Both of these factors are worthy of further exploration, given the likely impact of malicious envy on real world outcomes, such as acting in a harmful way towards another.

Finally, participants tended not to use the last category of the 6-point rating scale for the C-BRES. We would however recommend this range of response options as a reduction to 5 points may be subject to the same trend. People are reluctant to admit to envy and as a result may tend to deflate their rating of it. If necessary, low frequency categories can subsequently be merged for the purposes of analysis.

5. Conclusion, Limitations and Future directions

The findings of this study support the psychometric properties of the CBRES. As with any self-report measure designed to capture the experience of envy, the unbecoming reputation of this emotion may mean that people tend to under report their experience of it. Here we attempted to minimise this potential by omitting the word envy from the scale and by attempting to capture the experiential content of malicious envy via the thoughts and behaviour it tends to motivate.

As the psychometric properties of the CBRES were tested on a convenience sample, no formal norms are presented here. A second sample is currently being surveyed for that purpose. Future research plans also include the evaluation of the stability of the scale (test-retest reliability) and the confirmation of the factorial structure.

C-BRES: a new measure of envy

References

- Albert, S. M, Del Castillo-Castaneda, C. Sano, M. Jacobs, D. M. Marder, K. Bell, K. Bylsma, F. Lafleche, G. Brandt, J. Albert, M. Stern, Y., (1996).** ‘Quality of life in patients with Alzheimer’s disease as reported by patient proxies.’ *Journal of the American Geriatrics Society* 44, 1342-1347.
- Barth, D. F., (1988).** ‘The role of self-esteem in the experience of envy.’ *American Journal of Psychoanalysis* 48, 198-210.
- Bentler PM (1990).** Comparative fit indexes in structural models. *Psychological Bulletin* 107, 238-246.
- Browne MW, Cudeck R (1993).** Alternative ways of assessing model fit. In: **Bollen KA& Long JS (Eds).** *Testing structural equation models*. Newbury Park: Sage.
- Barth, L. A. Hafetz, J. Henninger, D. (2007).** ‘Gender differences in relational and physical aggression.’ *Social Behavior and Personality* 35, 41-50.
- Cohen-Charash, Y., (2009).** ‘Episodic envy.’ *Journal of Applied Social Psychology* 39, 2128-2173.
- Cronbach, L. J., (1951).** ‘Coefficient alpha and the internal structure of tests.’ *Psychometrika* 16, 297-334.

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

399

400   **Darwin Charles, Ekman Paul, Prodger Phillip** (1998) The Expression of the

401   Emotions in Man and Animals, 3rd edn, London: Harper Collins.

402

403   **DelPriore, D.J., Hill, S.E. Buss, D.M.,** (2012). Envy: Functional specificity and

404   sex-differentiated design features. *Personality and Individual Differences* 53: 317-

405   322.

406

407   **Dryden, W.** (1994). *Invitation to rational-emotive psychology*. London: Whurr

408   Publishers.

409

410   **Eysenck, S. B. G, Eysenck, H. J, Barrett, P.,** (1985). ‘A revised version of the

411   psychoticism scale.’ *Personality and Individual Differences* 6, 21-29.

412

413   **Gibbons, F. X, Buunk, B. P,** (1999). ‘Individual differences in social comparison:

414   development of a scale of social comparison orientation.’ *Journal of Personality and*

415   *Social Psychology* 76, 129-142.

416

417   **Hoelter, J.W.** (1983). The analysis of covariance structures: Goodness of fit

418   indices. *Sociological Methods & Research* 11, 325-344.

419

420   **Horn, J. L.** (1965). A rationale and test for the number of factors in factor analysis.

421   *Psychometrika*, 32, 179-185.

C-BRES: a new measure of envy

Hu, L.T. and Bentler, P.M. (1999), "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives," *Structural Equation Modeling*, 6 (1), 1-55.

IBM Corporation (2013). *IBM SPSS Statistics for Windows, Version 22.0*. Armonk, NY: IBM Corp.

Jordan, C., Chalder, T., (2013). 'Envy: the motivations and impact of envy.' *British Journal of Humanities and Social Sciences*, 9 (2), 9-22.

Krasnova, H., Wenninger, H. Widjaja, T., Buxmann, S., (2013)." Envy on Facebook: A hidden Threat to Users' Life Satisfaction?. 11th International conference wirtschaftsinfwmalik Leipzig. Germany.

Lazarus, Richard S. (1991). Progress on a cognitive-motivational-relational theory of Emotion. *American Psychologist*, 46(8), 819-834.

Linacre, J. M. (2004). Optimising rating scale category effectiveness . E.V. Smith Jr., R.M. Smith (Eds.), *Introduction to Rasch measurement: Theory, models, and applications*, JAM Press, Maple Grove, MN (2004), pp. 258–275

Linacre, J. M. (2015) *Facets computer program for many-facet Rasch measurement*, version 3.71.4. Beaverton, Oregon: Winsteps.com

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Muthén B, du Toit SHC, Spisic D (1997). Robust inference using weighted least squares and quadratic estimating equations in latent variable modelling with categorical and continuous outcomes. Unpublished technical report.

Muthén LK, Muthén BO (1998-2011). Mplus User's Guide, 6th Edn. Los Angeles, CA: Muthén & Muthén.

Novaco, R. W., (1994).” Anger as a risk factor for violence among the mentally disordered”. In Violence and mental disorder: developments in risk assessment (eds.) **Monahan, J, Steadman, H. J**, pp.21-59. Chicago: The University of Chicago Press.

Parrott, W. G, Smith, R. H., (1993). ‘Distinguishing the experiences of envy and jealousy.’ Journal of Personality and Social Psychology 64, 906-920.

Presaghi F., & Desimoni, M., (2014). random.polychor.pa: A Parallel Analysis With Polychoric Correlation Matrices. R package version 1.1.4-1. Retrieved from: <https://cran.r-project.org/web/packages/random.polychor.pa/random.polychor.pa.pdf>

Radloff, L. S., (1977). ‘The CES-D Scale: a self-report depression scale for research in the general population.’ Applied Psychological Measurement 1, 385-401.

C-BRES: a new measure of envy

Schaubroeck, J, Lam, S. S. K., (2004). ‘Comparing lots before and after: promotion rejectees’ invidious reactions to promotees.’ *Organizational Behavior and Human Decision Processes* 94, 33-47.

Silver, M., Sabini, J., (1978). ‘The social construction of envy.’ *Journal for the Theory of Social Behavior* 8, 313-332.

Smith, R. H, Kim, S. H., (2007). ‘Comprehending envy.’ *Psychological Bulletin* 133, 4664.

Smith, R. H., (2004). Envy and its transmutations. In **Leach, C. W. Tiedens, L.** (Eds.) *The social life of emotions* (pp.43-63). Cambridge, EN: Cambridge University Press.

Smith, R. H, Parrott, W. G, Diener, E. F., Hoyle, R. H. and Kim, S. H. (1999). ‘Dispositional Envy.’ *Personality and Social Psychology Bulletin* 25, 1007-1020.

Smith, R. H. Parrott, W. G. Ozer, D. and Moniz, A., (1994). ‘Subjective injustice and inferiority as predictors of hostile and depressive feelings in envy.’ *Personality and Social Psychology Bulletin* 20, 705-711.

Taciano, L. Milfont. L, Valdiney, V. Gouveia, E., (2009). “A Capital Sin: Dispositional Envy and its Relations to Wellbeing”. *Interamerican Journal of Psychology* 43(3)

C-BRES: a new measure of envy

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

497   **Van de Ven,N., Zeelenberg, M. Pieters, R.,** (2012). ‘Appraisal patterns of envy
498   and related emotions.’ Motivation and Emotion 36, 195-204.
499
500   **Vecchio, R.P.,** (2000).”Negative emotion in the work place”. Employees jealousy
501   and envy. International journal of stress management, 7, 161-179.

279x173mm (96 x 96 DPI)

Table 1: Demographic characteristics.

	n (%)
Gender	
<i>Males</i>	73 (36%)
<i>Females:</i>	130 (64%)
Age	
<i>16-21</i>	27 (13%)
<i>22-30</i>	112 (55%)
<i>31-40</i>	45 (22%)
<i>41⁺</i>	19 (10%)
Ethnicity	
<i>White</i>	110 (55%)
<i>Asian</i>	78 (38%)
<i>Other</i>	12 (6%)
Education	
<i>High school</i>	34 (17%)
<i>College</i>	122 (60%)
<i>Postgraduate:</i>	41 (24%)
<i>Professional</i>	6 (3%)
Marital status	
<i>Single</i>	83 (50%)
<i>In a relationship</i>	65 (32%)
<i>Married</i>	55 (27%)
Household income	
<i>> 10K</i>	79 (39%)
<i>10K-50K</i>	70 (35%)
<i>50K-100K</i>	37 (18%)
<i><100K</i>	9 (4%)
Housing	
<i>Owners</i>	87 (43%)
<i>Rental</i>	86 (42%)
<i>State rental</i>	3 (2%)
<i>Housing association</i>	19 (9%)

Table 2: EFA for categorical data solutions – Geomin rotated loadings and goodness of fit indices.

Item	Four factors – 22 items				Five factors – 22 items					Four factors – 19 items			
	1	2	3	4	IN	H	BR	MF	MAT	IN	H	BR	MF
01	0.89	0.03	-0.03	0.04	0.88	0.01	0.01	0.02	0.01	0.89	0.04	-0.03	0.01
02	0.91	0.07	0.03	-0.01	0.90	0.05	0.06	-0.03	0.03	0.93	0.06	0.03	-0.03
03	0.84	0.00	0.07	0.07	0.83	-0.01	0.12	0.06	0.00	0.86	-0.03	0.07	0.08
04	0.82	0.14	0.01	0.01	0.82	0.07	-0.04	0.01	0.13	0.86	0.11	-0.01	-0.01
07	0.03	0.73	-0.09	0.45	0.03	0.85	-0.05	0.13	0.05	0.04	0.89	-0.07	0.13
08	-0.01	0.74	0.03	0.33	-0.02	0.93	0.13	-0.08	0.00	-0.02	0.94	0.10	-0.07
09	0.08	0.63	0.06	0.34	0.08	0.70	0.04	0.09	0.13	0.10	0.73	0.07	0.09
10	0.11	0.54	0.43	-0.02	0.14	0.31	0.06	0.03	0.55	<i>(omitted)</i>			
11	0.02	0.62	0.59	-0.16	0.07	0.25	0.05	-0.03	0.76				
12	-0.08	0.44	0.55	0.05	-0.01	0.03	0.04	0.23	0.74				
14	0.10	0.18	0.14	0.60	0.12	0.04	-0.13	0.68	0.38	0.17	0.17	0.07	0.59
15	-0.06	0.04	0.33	0.53	-0.03	-0.07	0.19	0.57	0.25	-0.02	0.01	0.32	0.54
16	-0.05	0.01	-0.01	0.90	-0.06	0.10	0.05	0.83	-0.03	-0.10	0.12	-0.02	0.86
17	0.16	-0.06	0.03	0.78	0.16	-0.03	0.08	0.76	-0.02	0.14	-0.01	0.02	0.80
18	-0.15	0.15	0.78	0.11	-0.14	0.07	0.60	0.10	0.30	-0.07	0.05	0.79	0.09
19	0.14	0.01	0.57	0.26	0.12	0.07	0.57	0.20	0.03	0.13	0.01	0.59	0.24
20	0.04	-0.04	0.51	-0.02	0.04	-0.08	0.46	-0.01	0.10	0.06	-0.10	0.54	0.00
21	0.03	-0.03	0.96	-0.05	0.03	-0.09	0.79	-0.03	0.27	0.01	0.01	0.97	-0.09
22	0.04	-0.03	0.99	-0.03	0.02	-0.03	0.86	-0.07	0.21	-0.01	0.06	1.01	-0.13
23	-0.03	0.03	0.87	0.09	-0.06	0.11	0.81	-0.01	0.12	-0.03	0.03	0.90	0.04
25	0.10	0.01	0.65	0.18	0.06	0.17	0.71	0.05	-0.07	0.11	-0.02	0.68	0.16
26	0.14	-0.01	0.59	0.24	0.11	0.15	0.68	0.12	-0.11	0.13	-0.02	0.62	0.23
Goodness of fit indices													
Relative χ^2		2.10			1.70					1.70			
CFI		0.99			0.99					0.99			
RMSEA		0.074			0.057					0.058			
SRMR		0.032			0.024					0.025			

Key: injustice (IN), hostility (H), behavioural responses (BR), malicious feelings (MF) and malicious actions tendencies (MAT).

[Type here]

Table 3: Descriptives of C-BRES scores, Cronbach’s alpha, and gender comparison.

C-BRES	alpha	Complete sample (N=202)				Males (N=73)				Females (N=130)				Mann Whitney Test (genders)
		Mean	Median	SD	Range	Mean	Median	SD	Range	Mean	Median	SD	Range	
IN	0.95	8.2	9	5.2	0-16	8.8	10	5	0-16	7.8	9	5.4	0-16	U=4211.5, p=0.211
H	0.93	5	5	3.8	0-12	5.4	6	3.5	0-12	4.7	4	3.9	0-12	U=4211.0, p=0.209
BR	0.91	9.5	8	7.3	0-29	11.2	10	6.7	0-29	8.6	6	7.4	0-26	U=3500.5, p=0.002
MF	0.87	7.4	8	4.5	0-16	7.8	8	4.2	0-15	7.1	7	4.7	0-16	U=4241.0, p=0.240
MAT	0.90	3.3	2	3.7	0-12	4.5	3	4.1	0-12	2.6	1	3.3	0-12	U=3336.0, p<0.001
Total	0.96	33.3	30	20.8	0-76	37.7	34	19.9	5-76	30.8	28	20.9	0-76	U=3763.5, p=0.018

Key: C-BRES subscales: injustice (IN), hostility (H), behavioural responses (BR), malicious feelings (MF) and malicious actions tendencies (MAT).

Table 4: Spearmans's correlation coefficients among C-BRES scores and age.

C-BRES	Age	IN	H	BR	MF	MAT
IN	-0.1 (0.069)					
H	-0.2 (0.015)	0.7 (<0.001)				
BR	-0.1 (0.176)	0.6 (<0.001)	0.6 (<0.001)			
MF	-0.1 (0.043)	0.6 (<0.001)	0.7 (<0.001)	0.6 (<0.001)		
MAT	-0.2 (0.023)	0.7 (<0.001)	0.7 (<0.001)	0.7 (<0.001)	0.6 (<0.001)	
Total	-0.2 (0.020)	0.9 (<0.001)	0.9 (<0.001)	0.8 (<0.001)	0.8 (<0.001)	0.8 (<0.001)

Key: injustice (IN), hostility (H), behavioural responses (BR), malicious feelings (MF) and malicious actions tendencies (MAT).

Table 5: Spearmans’s correlation coefficients between C-BRES scores and other measures.

C-BRES	TS		H		IN		MAT		MF		BR	
Measures	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
DES	0.5	<0.001	0.4	<0.001	0.4	<0.001	0.5	<0.001	0.3	<0.001	0.4	<0.001
CES-D	0.5	<0.001	0.5	<0.001	0.4	<0.001	0.4	<0.001	0.4	<0.001	0.4	<0.001
NAS	0.5	<0.001	0.4	<0.001	0.4	<0.001	0.5	<0.001	0.4	<0.001	0.4	<0.001
EPQ-E	0.0	0.955	0.0	0.960	0.0	0.651	0.1	0.430	-0.1	0.404	0.1	0.477
EPQ-P	0.5	<0.001	0.5	<0.001	0.4	<0.001	0.5	<0.001	0.3	<0.001	0.5	<0.001
EPQ-N	0.4	<0.001	0.3	<0.001	0.4	<0.001	0.2	0.003	0.4	<0.001	0.3	<0.001
QoL	-0.3	<0.001	-0.3	<0.001	-0.3	<0.001	-0.3	<0.001	-0.3	0.002	-0.3	<0.001
INCOM	-0.1	0.167	-0.1	0.435	-0.1	0.172	-0.1	0.102	0.0	0.758	-0.1	0.234

Key: TS: total scale CBRES, injustice (IN), hostility (H), behavioural responses (BR), malicious feelings (MF) and malicious actions tendencies (MAT), DES: Dispositional Envy Scale, CES-D; Centre for Epidemiological studies Depression scale, NAS ; Novaco Anger Scale, QoL-AI; Quality of Life Activity Inventory, EPQ: Eysenck personality inventory (P) psychoticism (N) neuroticism, INCOM: Iowa-Netherlands Comparison Orientation Measure.

APPENDIX 1: Cognitive Behavioural Responses to Envy Scale

C-BRES scale	
01.	It is unfair that others have things that I would like
02.	It is unfair that other people are more attractive than I am
03.	It is unfair that other people are more fortunate than I am
04.	It is unfair that other people are cleverer than I am
07.	I feel hostile towards people who have what I want
08.	I feel hostile towards people who are attractive
09.	I feel hostile towards people who find things easy
10.	I have thoughts about destroying what the other person has
11.	I have thoughts about harming the other person who has what I want
12.	I have thoughts of taking what I want from the other person
14.	I feel bitter about someone else having what I want
15.	I feel angry about not having something I want
16.	I feel depressed at not having an attribute that some-one else has
17.	I feel inferior to others when they have something I want
18.	I have stolen something I have wanted that belongs to someone else
19.	I avoid fortunate people
20.	I mix with people less fortunate than myself
21.	I have caused harm to someone who has what I want
22.	I have physically hurt someone who has what I want
23.	I have damaged an object that belongs to someone

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

else but that I want
25. I have verbally disparaged someone I want to be like
26. I avoid seeing people who I perceive to have what I want
<i>Omitted items</i>
<i>05. I feel bad about myself because I don't have the attributes or talents of others</i>
<i>06. I feel bad about myself because I don't have the possessions of others</i>
<i>13. I have denigrating thoughts about the person who has what I want</i>
<i>24. I have verbally disparaged someone who has what I want</i>
<i>27. I try to mix with people who have the life I want</i>

APPENDIX 2: Final Cognitive Behavioural Responses to Envy Scale

C-BRES	0 Totally Disagree	1 Disagree very much	2 Disagree slightly	3 Agree slightly	4 Agree very much	5 Totally agree
01. It is unfair that others have things that I would like						
02. It is unfair that other people are more attractive than I am						
03. It is unfair that other people are more fortunate than I am						
04. It is unfair that other people are cleverer than I am						
07. I feel hostile towards people who have what I want						
08. I feel hostile towards people who are attractive						
09. I feel hostile						

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

towards people who find things easy						
10. I have thoughts about destroying what the other person has						
11. I have thoughts about harming the other person who has what I want						
12. I have thoughts of taking what I want from the other person						
14. I feel bitter about someone else having what I want						
15. I feel angry about not having something I want						
16. I feel depressed at not having an attribute that some-one else has						
17. I feel inferior to others when						

they have something I want						
18. I have stolen something I have wanted that belongs to someone else						
19. I avoid fortunate people						
20. I mix with people less fortunate than myself						
21. I have caused harm to someone who has what I want						
22. I have physically hurt someone who has what I want						
23. I have damaged an object that belongs to someone else but that I want						
25. I have verbally disparaged someone I want to be like						
26. I avoid						

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

seeing people who I perceive to have what I want						