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

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

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## C-BRES: a new measure of envy

**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 50 Contemporary research has identified a further affective component to this emotion;  
4  
5 51 an increase in motivation to move up to gain the desired attribute. Several studies  
6  
7  
8 52 have found that this distinct dimension of envy is associated with heightened  
9  
10 53 performance (Lange et al, 2015) and an increase in personal effort to obtain the  
11  
12 54 desired object (Schaubroeck et al, 2004, Van de Ven et al, 2012, Crusius et al, 2012,  
13  
14  
15 55 2015).

16  
17 56  
18  
19 57 These varying dimensions of envy are clearly connected to distinct cognitive and  
20  
21 58 behavioural responses which can be broadly categorised into either malicious or  
22  
23  
24 59 benign versions of this emotion. Many recent research studies support this  
25  
26 60 distinction with malicious envy being characterised by thoughts and behaviour  
27  
28 61 aimed at dragging the envied other down whilst in contrast benign envy promotes  
29  
30 62 motivation to move up to gain the envied attribute (Van de Ven et al, 2012). The  
31  
32  
33 63 nature of malicious envy shows some similarity to unhealthy anger in that both  
34  
35 64 emotions are associated with thoughts of injustice and aggressive behaviour. It  
36  
37  
38 65 seems logical that the experience of malicious envy may lead to unhealthy anger as  
39  
40 66 the individual recognises that they do not have that which they desire and attributes  
41  
42 67 this to an unfair distribution of advantage or privilege.  
43  
44  
45 68

46  
47 69 Most scales that have been introduced to measure envy have focused on historical  
48  
49 70 conceptualisations of malicious envy and have been designed to assess an  
50  
51 71 individual's predisposition to experiencing it (Smith et al, 1999, Gold et al, 1996,  
52  
53  
54 72 Lange et al 2015). For example, the disposition envy scale (DES), is an 8 item self-  
55  
56 73 report measure which focuses on thoughts about inadequacy, unfairness and the  
57  
58 74 success of others (Smith et al, 1999). It correlates with negative psychological  
59  
60

## C-BRES: a new measure of envy

1  
2  
3 75 outcomes such as low self- esteem, depression, neuroticism and resentment. The  
4  
5 76 York enviousness scale focuses on the emotional facets of resentment and ill will  
6  
7  
8 77 and is linked to higher levels of anger and hostility (Gold et al, 1996). In contrast,  
9  
10 78 the recently developed benign malicious envy scale (BeMaS) contains items  
11  
12 79 relating to the appraisals and emotional aspects of both types of envy. The five Items  
13  
14 80 which are indicative of benign envy are centred on thoughts of increasing personal  
15  
16  
17 81 effort to obtain the envied object or attribute and show's an association with  
18  
19 82 increased inspiration and hopefulness for the future. The five Items suggestive of  
20  
21 83 malicious envy concentrate on feelings of ill will towards the envied person and a  
22  
23  
24 84 wish to see them fail and is linked to an increased fear of personal failure (Lange et  
25  
26 85 al, 2015).

27  
28 86  
29  
30  
31 87 In order to measure malicious envy each of these scales has focused on a differing  
32  
33 88 and narrow range of cognitions and emotions indicative of this emotional  
34  
35 89 experience. There is a notable absence of items relating to the antisocial motivations  
36  
37  
38 90 and behaviours empirically linked to and often included in theoretical definitions of  
39  
40 91 this emotion (Delpriore et al, 2012). Within the workplace several studies have  
41  
42 92 observed behaviours which include employees spreading malicious rumours,  
43  
44 93 providing misinformation and verbally disparaging their rival to colleagues, all with  
45  
46  
47 94 the sole intention of harming their envied colleagues reputation or performance  
48  
49 95 (Vecchio et al, 2000, Cohen-Charash et al, 2009).

50  
51 96  
52  
53  
54 97 While aggressive envy-related behaviour is frequently identified in the empirical  
55  
56 98 literature two studies have also identified a tendency for malicious envy to  
57  
58 99 demotivate behaviour. One study found avoidance or withdrawal from the envy  
59  
60

## C-BRES: a new measure of envy

1  
2  
3 100 provoking situation to be a commonly reported behavioural response (Jordan et al  
4  
5 101 2013), whilst the other noted a decrease in goal directed behaviour (Lange et al,  
6  
7  
8 102 2015).

9  
10 103  
11  
12 104 The absence of items relating to these core behavioural tendencies of malicious envy  
13  
14 105 on contemporary measures may have important implications for effective  
15  
16  
17 106 measurement and understanding of this emotion. Over the last 200 years,  
18  
19 107 researchers from Charles Darwin (1872) to Richard Lazarus (1991) have proposed  
20  
21 108 models of emotion which recognise that affective states have distinguishable and  
22  
23  
24 109 consistent motivational dynamics (Lang et al, 1995). The ability to distinguish,  
25  
26 110 measure and correlate the emotional experience of malicious envy may therefore be  
27  
28 111 improved by a scale which contains items which capture its core cognitive and  
29  
30 112 behavioural responses.

31  
32  
33 113  
34  
35 114 The aim of this paper was to develop a new valid and reliable measure of malicious  
36  
37 115 envy (C-BRES) which included items which represented the cognitive, emotional  
38  
39  
40 116 and behavioural responses empirically associated with this emotion (Van De Ven,  
41  
42 117 2012). Our approach involved generating a set of candidate items based on the  
43  
44 118 findings of a qualitative questionnaire study previously carried out by the authors  
45  
46 119 (Jordan et al, 2013), in combination with a review of the wider literature.

47  
48  
49 120  
50  
51 121 The goals of this study were to assess a) which of the items from the initial pool  
52  
53 122 should be retained b) the factor structure of the C-BRES and c) the concurrent  
54  
55  
56 123 construct validity (convergent and discriminant) of the C-BRES.

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## C-BRES: a new measure of envy

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3 125 We hypothesised that (1) the Cognitive – Behavioural responses to envy scale (C-  
4  
5 126 BRES) would have good reliability and internal consistency (2) the C-BRES scores  
6  
7  
8 127 would be correlated with the dispositional envy scale scores (3) high C-BRES scores  
9  
10 128 would be associated with high levels of depression, neuroticism, psychoticism,  
11  
12 129 anger, and low levels of self-esteem and a reduced quality of life.  
13  
14  
15 130

## 18 131 **2. Materials and methods**

### 21 132 **2.1 Design of the scale**

23 133 Firstly, we generated a set of candidate items based on the findings of a previous  
24  
25 134 study conducted by the authors (Jordan et al, 2013). This study explored the lived  
26  
27  
28 135 experience of malicious envy from the envious' perspective and provided detailed  
29  
30 136 information on the specific cognitive, emotional and behavioural components of this  
31  
32 137 dimension of envy as reported by 50 participants. These included perceived  
33  
34  
35 138 unfairness, inferiority and sense of loss/failure as well as hostile thoughts, harming  
36  
37 139 behaviours, verbal disparagement and avoidance.  
38  
39 140

41 141 Between one and three items were created for each category and were phrased as a  
42  
43  
44 142 behaviour or thinking a person might experience when feeling envious. For  
45  
46 143 example, the category of perceived inferiority was tapped by item 17 "I feel inferior  
47  
48 144 to others when they have something I want". Item 10 (I try to mix with people who  
49  
50 145 have the life I want) was reversed to break tendencies towards a response set.  
51  
52 146

55 147 The reluctance of people to admit to feeling envy was addressed by items designed  
56  
57  
58 148 to assess solely the thoughts and behaviour which reflect envy. For example, item  
59  
60

## C-BRES: a new measure of envy

1  
2  
3 149 5 “I feel bad about myself because I don’t have the attributes or talents of others”.

4  
5 150 As such, the word “envy” was avoided.

6  
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8 151  
9  
10 152 Responses for this measure rated the extent to which it accurately described the  
11  
12 153 individual’s thoughts and behaviours toward the object or person. Items were rated  
13  
14 154 on a 6-point Likert scale, ranging from 0 (totally disagree) to 5 (totally agree), a  
15  
16  
17 155 higher score being indicative of a greater level of envy. The initial pool of items is  
18  
19 156 presented in Appendix 1.  
20  
21  
22 157

## 23 24 25 158 **2.2 Participants and procedure**

26  
27 159 A sample of 203 people participated, recruited through a circular email to the staff  
28  
29 160 and students of a London based university, a social networking site and an  
30  
31 161 advertisement placed on the notice board of a hostel in London, UK. Concurrently  
32  
33 162 with the C-BRES, the participants were asked to complete either on-line or in a pen-  
34  
35 163 and-paper format the *Dispositional Envy Scale* (DES; Smith et al., 1999), the *Centre*  
36  
37 164 *for Epidemiological studies Depression scale* (CES-D; Radloff, 1977), the *Novaco*  
38  
39 165 *Anger Scale* (NAS; Novaco, 1994), the *Quality of Life Activity Inventory* (QoL-AI;  
40  
41 166 Albert et al, 1996), and Eysenck personality inventory (EPQ; Eysenck et al, 1985)  
42  
43 167 and the *Iowa-Netherlands Comparison Orientation Measure* (Gibbons et al, 1999).  
44  
45 168 These measures were selected for evaluating the validity of C-BRES, as they were  
46  
47 169 justified in the literature to have a theoretical or empirical link to envy. Ethical  
48  
49 170 approval for this study was granted by King’s College London- PNM/11/12-66.  
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### 172 **2.3 Analysis**

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

185  
186 The reliability (internal consistency) of the factors and the total scale was evaluated  
187 using Cronbach's (1951) alpha. Evidence towards the concurrent construct validity  
188 (convergent and discriminant) of the C-BRES are reported in relation to other  
189 measures using non parametric methods, namely the Spearman's correlation  
190 coefficient and the Mann-Whitney test.

191  
192 The reliability and the validity assessment were conducted using the Statistical  
193 Package for the Social Sciences (version 22; IBM, 2013). The evaluation of the  
194 rating scale was carried out using the Facets software (Linacre, 2015). EFA was  
195 conducted in Mplus (Muthén & Muthén, 1988-2011) and parallel analysis was

## C-BRES: a new measure of envy

1  
2  
3 196 carried out using the ‘random.polychor.pa’ *R* package (Presaghi & Desimoni,  
4  
5 197 2014).

6  
7  
8 198

9  
10 199 **3. Results**

11  
12  
13 200 **3.1 Descriptive Characteristics**

14  
15 201 The demographic characteristics of the final sample are presented in Table 1. No  
16  
17  
18 202 significant differences emerged between genders in any of the demographic  
19  
20 203 characteristics ( $p>0.10$  in all cases).

21  
22  
23 204

24 205 **About here: Table 1: Demographic characteristics.**

25  
26 206

27  
28  
29 207

30  
31 208 **3.2 Exploratory factor analysis for categorical data**

32  
33 209 The inspection of the frequencies of the items revealed that the responders tended  
34  
35  
36 210 not to choose the last category (5: “totally agree”). In fact, the absolute frequency  
37  
38 211 of this category did not exceed 5 in any of the items. In order to have sufficient data  
39  
40 212 (per cell) to proceed with item factor analysis the last two categories were merged.

41  
42  
43 213

44  
45 214 EFA for categorical items was conducted and four eigenvalues above one (16.2, 2.2,  
46  
47 215 1.5, 1.2) were present. However adequate fit was achieved when the number of  
48  
49  
50 216 factors was increased to five (relative  $\chi^2= 1.9$ , CFI=0.99, RMSEA=0.068 and  
51  
52 217 SRMR=0.034). The results of this initial analysis were used for item selection. In  
53  
54 218 particular, items that did not load (Geomin rotation) sufficiently in any of the factors  
55  
56 219 (item 27) or had large loadings in more than one factors (items 5, 6, 13 and 24)  
57  
58  
59 220 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  
3 247 categories. The initial scaling was found indeed to be suitable as no distorted  
4  
5 248 thresholds were present in any of the factors (please see Linacre, 2004 for details).  
6  
7  
8 249 This is illustrated graphically in Figure 1; the 6 categories smoothly follow the  
9  
10 250 expected order, with lower categories (for instance responses “1”) being placed at  
11  
12 251 lower levels of hostility (to the left) and vice versa. Each category (response option)  
13  
14 252 takes its peak at a point where the probability of this response is higher than all other  
15  
16  
17 253 responses. Therefore, the 6-point rating scale is recommended even if for the needs  
18  
19 254 of the analysis solely, low frequency categories might need to be merged in some  
20  
21  
22 255 samples.

23  
24 256  
25  
26 257  
27 258 **About here: Figure 1: Response options probabilities – Hostility dimension**

29 259  
30  
31 260

### 3.4 Descriptive indices and reliability

32  
33 261  
34  
35  
36 262 Table 3 presents the descriptive indices of the factors and the total score for the total  
37  
38 263 sample and separately for each gender. All scores were skewed to the right which  
39  
40 264 indicates a reluctance for participants to report the most extreme levels of envy and  
41  
42  
43 265 is congruent with previous research indicating people are often reluctant to admit to  
44  
45 266 feeling envy and try to conceal it (Silver at al 1978). Further, envy may need to be  
46  
47 267 present and in operation for the participants to be able recall their most envious  
48  
49  
50 268 thoughts or desires. The internal consistency (reliability) was satisfactory in all  
51  
52 269 cases, even in factors constituted by three items such as H and MAT (Table 3).  
53  
54 270 Males scored higher than females in MAT and BR factors, leading to an increased  
55  
56  
57 271 total score. Age correlated negatively and weakly with the factors and total scores

C-BRES: a new measure of envy

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

274

275

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

278

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

281

282

### 283 **3.5 Evidence towards validity**

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

292

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

295

## 296 **4. Discussion**

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

## C-BRES: a new measure of envy

1  
2  
3 299 characterised by five dimensions, four illustrating key cognitive responses (thoughts  
4  
5 300 of injustice - IN), hostility (H), maliciousness (MF) and malicious actions (MAT)  
6  
7 301 and one highlighting primarily harming behaviours (BR) (e.g., *I have caused harm*  
8  
9 302 *to someone who has what I want*). The items indicative of these factors possess clear  
10  
11 303 content validity as each has been consistently empirically linked to the experiential  
12  
13 304 content of malicious envy (Smith et al, 1999, Vecchio et al, 2000, Cohen-Charash  
14  
15 305 et al, 2009). The reliability of the scale was satisfactory in all cases, even in factors  
16  
17 306 constituted by three items such as Hostility and Malicious action tendencies.  
18  
19  
20  
21  
22 307

23  
24 308 A measure of the scale's concurrent validity was obtained through the comparison  
25  
26 309 of participants scores on the C-BRES and DES (Smith et al, 1999). A significant  
27  
28 310 relationship between all five factors of the C-BRES and the DES was identified  
29  
30 311 which suggests that the measures are tapping a common underlying factor.  
31  
32

33 312  
34  
35 313 The C-BRES for the most part, correlated in empirically compatible ways with  
36  
37 314 psychological measures providing evidence of construct validity. Correlation  
38  
39 315 coefficients point to a strong positive association with depression, anger,  
40  
41 316 psychoticism and neuroticism and a negative association with quality of life (Smith  
42  
43 317 et al 1999, Parrott et al 1993).  
44  
45  
46

47 318  
48  
49 319 Neuroticism is typified by negative affect and a tendency to interpret ordinary  
50  
51 320 situations in an extreme way. It is consistently linked to a range of negative mental  
52  
53 321 health outcomes. Psychoticism is associated with hostility, being achievement  
54  
55 322 orientated and dogmatic. These personality traits therefore overlap with envy in  
56  
57 323 experiential content and an association between them would be predicted (Eysenck  
58  
59  
60



## C-BRES: a new measure of envy

1  
2  
3 324 et al, 1976). Envy does not however share any features with extraversion such as  
4  
5 325 being sociable or irresponsible. The absence of a relationship between this sub scale  
6  
7  
8 326 on the EPQ and the C-BRES would be therefore be expected and provides some  
9  
10 327 support for the discriminant validity of the C-BRES (Eysenck et al, 1976).

11  
12 328

13  
14  
15 329 In contrast to previous studies, no relationship was found between envy as measured  
16  
17 330 by C-BRES and the tendency to make social comparisons. This is unexpected but  
18  
19 331 understandable on closer scrutiny of the items comprising the INCOM (Gibbons et  
20  
21 332 al, 1999). This measure sets out a range of social situations in which comparison  
22  
23  
24 333 might occur, for example considering how someone else might react in a similar  
25  
26 334 situation. According to our results this may not be pertinent to the experience of  
27  
28  
29 335 envy. The absence of a relationship between the C-BRES and INCOM may  
30  
31 336 therefore reflect the ability of the C-BRES to distinguish the specific cognitive and  
32  
33 337 behavioural responses of envying from the process of general social comparison.  
34  
35 338 This may be further evidence of the discriminant validity of this measure (Gibbons  
36  
37  
38 339 et al, 1999).

39  
40 340

41  
42 341 When examining the relationship with socio-demographic variables and envy, it is  
43  
44 342 apparent that males score higher than females for malicious action tendencies and  
45  
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47 343 behavioural responses. Although this may be a consequence of it being more  
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49 344 socially acceptable for men than women to admit to and engage in aggressive or  
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51 345 hostile behaviours (Burton et al, 2007), it also suggests that envy motivates a  
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54 346 different response in men and women. Several studies have previously detected  
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56 347 differences in the situations or attributes provoking envy for men and women. It is  
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58 348 also possible that gender motivates different action tendencies (Delpriore et al,  
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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.

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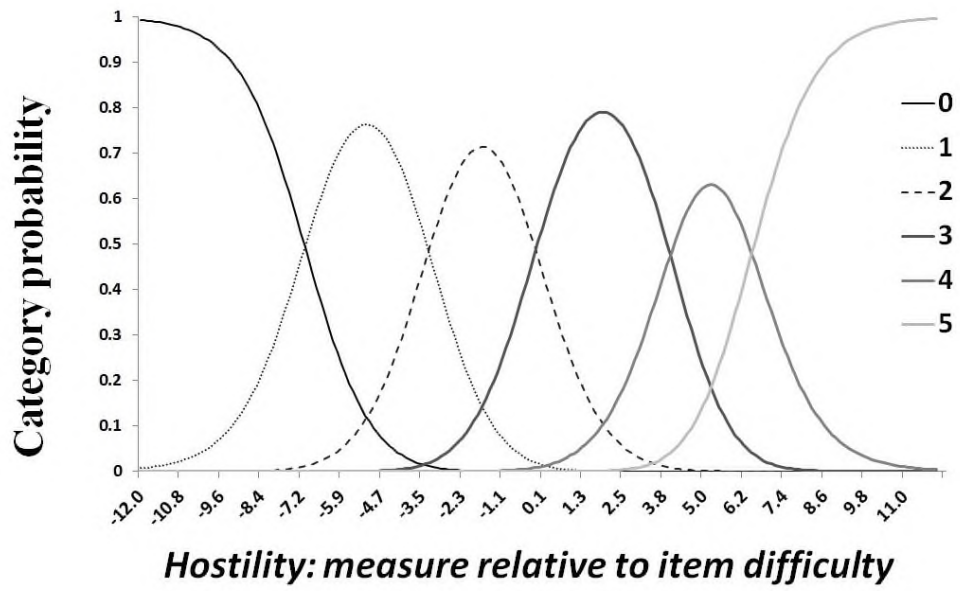
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**Table 1: Demographic characteristics.**

	n (%)
<b>Gender</b>	
<i>Males</i>	73 (36%)
<i>Females:</i>	130 (64%)
<b>Age</b>	
<i>16-21</i>	27 (13%)
<i>22-30</i>	112 (55%)
<i>31-40</i>	45 (22%)
<i>41+</i>	19 (10%)
<b>Ethnicity</b>	
<i>White</i>	110 (55%)
<i>Asian</i>	78 (38%)
<i>Other</i>	12 (6%)
<b>Education</b>	
<i>High school</i>	34 (17%)
<i>College</i>	122 (60%)
<i>Postgraduate:</i>	41 (24%)
<i>Professional</i>	6 (3%)
<b>Marital status</b>	
<i>Single</i>	83 (50%)
<i>In a relationship</i>	65 (32%)
<i>Married</i>	55 (27%)
<b>Household income</b>	
<b>&gt; 10K</b>	79 (39%)
<b>10K-50K</b>	70 (35%)
<b>50K-100K</b>	37 (18%)
<b>&lt;100K</b>	9 (4%)
<b>Housing</b>	
<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	<b>0.89</b>	0.03	-0.03	0.04	<b>0.88</b>	0.01	0.01	0.02	0.01	<b>0.89</b>	0.04	-0.03	0.01
02	<b>0.91</b>	0.07	0.03	-0.01	<b>0.90</b>	0.05	0.06	-0.03	0.03	<b>0.93</b>	0.06	0.03	-0.03
03	<b>0.84</b>	0.00	0.07	0.07	<b>0.83</b>	-0.01	0.12	0.06	0.00	<b>0.86</b>	-0.03	0.07	0.08
04	<b>0.82</b>	0.14	0.01	0.01	<b>0.82</b>	0.07	-0.04	0.01	0.13	<b>0.86</b>	0.11	-0.01	-0.01
07	0.03	<b>0.73</b>	-0.09	<b>0.45</b>	0.03	<b>0.85</b>	-0.05	0.13	0.05	0.04	<b>0.89</b>	-0.07	0.13
08	-0.01	<b>0.74</b>	0.03	<b>0.33</b>	-0.02	<b>0.93</b>	0.13	-0.08	0.00	-0.02	<b>0.94</b>	0.10	-0.07
09	0.08	<b>0.63</b>	0.06	<b>0.34</b>	0.08	<b>0.70</b>	0.04	0.09	0.13	0.10	<b>0.73</b>	0.07	0.09
10	0.11	<b>0.54</b>	<b>0.43</b>	-0.02	0.14	<b>0.31</b>	0.06	0.03	<b>0.55</b>	<i>(omitted)</i>			
11	0.02	<b>0.62</b>	<b>0.59</b>	-0.16	0.07	0.25	0.05	-0.03	<b>0.76</b>				
12	-0.08	<b>0.44</b>	<b>0.55</b>	0.05	-0.01	0.03	0.04	0.23	<b>0.74</b>				
14	0.10	0.18	0.14	<b>0.60</b>	0.12	0.04	-0.13	<b>0.68</b>	<b>0.38</b>	0.17	0.17	0.07	<b>0.59</b>
15	-0.06	0.04	<b>0.33</b>	<b>0.53</b>	-0.03	-0.07	0.19	<b>0.57</b>	0.25	-0.02	0.01	<b>0.32</b>	<b>0.54</b>
16	-0.05	0.01	-0.01	<b>0.90</b>	-0.06	0.10	0.05	<b>0.83</b>	-0.03	-0.10	0.12	-0.02	<b>0.86</b>
17	0.16	-0.06	0.03	<b>0.78</b>	0.16	-0.03	0.08	<b>0.76</b>	-0.02	0.14	-0.01	0.02	<b>0.80</b>
18	-0.15	0.15	<b>0.78</b>	0.11	-0.14	0.07	<b>0.60</b>	0.10	<b>0.30</b>	-0.07	0.05	<b>0.79</b>	0.09
19	0.14	0.01	<b>0.57</b>	0.26	0.12	0.07	<b>0.57</b>	0.20	0.03	0.13	0.01	<b>0.59</b>	0.24
20	0.04	-0.04	<b>0.51</b>	-0.02	0.04	-0.08	<b>0.46</b>	-0.01	0.10	0.06	-0.10	<b>0.54</b>	0.00
21	0.03	-0.03	<b>0.96</b>	-0.05	0.03	-0.09	<b>0.79</b>	-0.03	0.27	0.01	0.01	<b>0.97</b>	-0.09
22	0.04	-0.03	<b>0.99</b>	-0.03	0.02	-0.03	<b>0.86</b>	-0.07	0.21	-0.01	0.06	<b>1.01</b>	-0.13
23	-0.03	0.03	<b>0.87</b>	0.09	-0.06	0.11	<b>0.81</b>	-0.01	0.12	-0.03	0.03	<b>0.90</b>	0.04
25	0.10	0.01	<b>0.65</b>	0.18	0.06	0.17	<b>0.71</b>	0.05	-0.07	0.11	-0.02	<b>0.68</b>	0.16
26	0.14	-0.01	<b>0.59</b>	0.24	0.11	0.15	<b>0.68</b>	0.12	-0.11	0.13	-0.02	<b>0.62</b>	0.23
<b>Goodness of fit indices</b>													
<b>Relative <math>\chi^2</math></b>	<b>2.10</b>				<b>1.70</b>					<b>1.70</b>			
<b>CFI</b>	<b>0.99</b>				<b>0.99</b>					<b>0.99</b>			
<b>RMSEA</b>	<b>0.074</b>				<b>0.057</b>					<b>0.058</b>			
<b>SRMR</b>	<b>0.032</b>				<b>0.024</b>					<b>0.025</b>			

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

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**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)				<i>Mann Whitney Test (genders)</i>
		Mean	Median	SD	Range	Mean	Median	SD	Range	Mean	Median	SD	Range	
<b>IN</b>	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
<b>H</b>	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
<b>BR</b>	0.91	9.5	8	7.3	0-29	11.2	10	6.7	0-29	8.6	6	7.4	0-26	<b>U=3500.5, p=0.002</b>
<b>MF</b>	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
<b>MAT</b>	0.90	3.3	2	3.7	0-12	4.5	3	4.1	0-12	2.6	1	3.3	0-12	<b>U=3336.0, p&lt;0.001</b>
<b>Total</b>	0.96	33.3	30	20.8	0-76	37.7	34	19.9	5-76	30.8	28	20.9	0-76	<b>U=3763.5, p=0.018</b>

*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.**

<b>C-BRES</b>	<b>Age</b>	<b>IN</b>	<b>H</b>	<b>BR</b>	<b>MF</b>	<b>MAT</b>
<b>IN</b>	-0.1 (0.069)					
<b>H</b>	-0.2 (0.015)	0.7 (<0.001)				
<b>BR</b>	-0.1 (0.176)	0.6 (<0.001)	0.6 (<0.001)			
<b>MF</b>	-0.1 (0.043)	0.6 (<0.001)	0.7 (<0.001)	0.6 (<0.001)		
<b>MAT</b>	-0.2 (0.023)	0.7 (<0.001)	0.7 (<0.001)	0.7 (<0.001)	0.6 (<0.001)	
<b>Total</b>	-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 Measures	TS		H		IN		MAT		MF		BR	
	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
<b>DES</b>	0.5	<0.001	0.4	<0.001	0.4	<0.001	0.5	<0.001	0.3	<0.001	0.4	<0.001
<b>CES-D</b>	<b>0.5</b>	<b>&lt;0.001</b>	<b>0.5</b>	<b>&lt;0.001</b>	<b>0.4</b>	<b>&lt;0.001</b>	<b>0.4</b>	<b>&lt;0.001</b>	<b>0.4</b>	<b>&lt;0.001</b>	<b>0.4</b>	<b>&lt;0.001</b>
<b>NAS</b>	0.5	<0.001	0.4	<0.001	0.4	<0.001	0.5	<0.001	0.4	<0.001	0.4	<0.001
<b>EPQ-E</b>	0.0	0.955	0.0	0.960	0.0	0.651	0.1	0.430	-0.1	0.404	0.1	0.477
<b>EPQ-P</b>	0.5	<0.001	0.5	<0.001	0.4	<0.001	0.5	<0.001	0.3	<0.001	0.5	<0.001
<b>EPQ-N</b>	0.4	<0.001	0.3	<0.001	0.4	<0.001	0.2	0.003	0.4	<0.001	0.3	<0.001
<b>QoL</b>	-0.3	<0.001	-0.3	<0.001	-0.3	<0.001	-0.3	<0.001	-0.3	0.002	-0.3	<0.001
<b>INCOM</b>	-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.*

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### APPENDIX 1: Cognitive Behavioural Responses to Envy Scale

<b>C-BRES scale</b>
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

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3	else but that I want
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5	25. I have verbally disparaged someone I want to be
6	like
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8	26. I avoid seeing people who I perceive to have what
9	I want
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12	<b><i>Omitted items</i></b>
13	
14	<i>05. I feel bad about myself because I don't have the</i>
15	<i>attributes or talents of others</i>
16	
17	<i>06. I feel bad about myself because I don't have the</i>
18	<i>possessions of others</i>
19	
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21	<i>13. I have denigrating thoughts about the person who</i>
22	<i>has what I want</i>
23	
24	<i>24. I have verbally disparaged someone who has what</i>
25	<i>I want</i>
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28	<i>27. I try to mix with people who have the life I want</i>
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### APPENDIX 2: Final Cognitive Behavioural Responses to Envy Scale

<b>C-BRES</b>	<b>0 Totally Disagree</b>	<b>1 Disagree very much</b>	<b>2 Disagree slightly</b>	<b>3 Agree slightly</b>	<b>4 Agree very much</b>	<b>5 Totally agree</b>
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						

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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						

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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						

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seeing people who I perceive to have what I want						
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