

Assessment

Physical appearance as a measure of social ranking: The role of a new scale to understand the relationship between weight and dieting

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This study presents the development of a new self-report instrument to assess how an individual perceives himself as social agent within his group having physical appearance as a reference, the Social Comparison through Physical Appearance Scale (SCPAS). This scale adds to the existent measures by assessing the social ranking based on one's physical appearance, and not the tendency to make comparisons of the general physical appearance or specific body parts. Its psychometric characteristics are investigated in a sample of 828 female participants from normal population. Principal components analysis was conducted for each part of the instrument: the Part A: peers shows a 2-factor structure (Attractiveness/Rank and Group Fit) explaining 72.142% of the variance; the Part B: models presents a one-dimensional structure that explains 69.191% of the variance. Findings show very good internal consistency coefficients and test-retest reliability. The two parts of the SCPAS are significantly associated to social comparison and shame measures, to anxiety, depression and stress indicators, and to eating disorders symptomatology. The scale discriminates between a clinical sample of 91 patients with an eating disorder and a non-clinical sample of 102 participants. Regression analyses pointed out that social comparison through physical appearance with peers and models partially mediates the effect of the dissatisfaction with current weight on disordered eating, namely drive for thinness. Copyright © 2011 John Wiley & Sons, Ltd.

Key Practitioner Message:

- The SCPAS is a new self-report questionnaire for assessing social ranking evaluation through the subjective comparison of physical appearance with others.
- The SCPAS is a brief measure with very good internal consistency, test-retest reliability, convergent and divergent validity, and it shows a satisfactory accuracy for discriminating between eating disorder patients and non-clinical participants.
- Findings suggest that disordered eating, namely dieting and thinness seeking, does not directly result from body image dissatisfaction, and other processes, such as perceptions of a low social rank that derive from appearance-based comparisons, are probably involved.

Keywords: Social Comparison, Physical Appearance, Weight and Body Image Dissatisfaction, Disordered Eating

Social comparison is considered as a fundamental human social process (Buunk & Gibbons, 2007; Festinger, 1954). Gilbert, Price and Allan (1995) state that the need to compare self with others, also recognizable in other species, is an adaptive mechanism to estimate self-rank/status within the group. This process seems to focus on two

major evaluation dimensions: of relative strength, power and aggressiveness; and of social attractiveness and talent (Allan & Gilbert, 1995). Humans have always competed to be seen as attractive by others because those regarded as so were chosen in detriment of the less attractive ones, and had better access to advantageous social resources (e.g., support from others, allies and social partners) (Allan & Gilbert, 1995). Thus, the display of attractive features of the self often defines ones social rank (Barkow, 1980; Kemper, 1990). An individual has to be aware about the qualities that a group give high attractiveness ratings to (e.g., forms of beauty; Gilbert, 2002), in order to know

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how others see him as a social agent. And it is through the comparison with others that he perceives which domains are valued, and by which means he should adapt his behaviour and put an effort in those domains, to raise his own status. The perception of a low social rank acts as a threat of exclusion from the group, leading to negative consequences such as shame (Broucek, 1991; Gilbert, 1992; Kaufman, 1989), and it activates defensive responses (e.g., anxiety and anger) (Gilbert et al., 1995).

The female body shape has always been an indicator of social resources and reproductive potential (Abed, 1998; Gatward, 2007). Thus, for the majority of women, the physical appearance is a central self-evaluative dimension (Gilbert et al., 1995; Troop, Allan, Treasure, & Katzman, 2003). There is, in Western societies, a continuous emphasis in feminine attractiveness, focused in an extremely thin body shape. Also, social messages proclaim that thinness is linked to success, power and happiness (Strahan, Wilson, Cressman, & Buote, 2006). Thus, in this context, the control over eating, weight and body image emerge as a strategy to assure a certain social position and to compete for social advantages (Gatward, 2007; Burkle, Ryckman, Gold, Thornton, & Audesse, 1999). Therefore, social judgement of appearance seems partly responsible for unrealistic weight goals sought by women, leading to widespread tendencies to diet and attempts to lose weight (Conley & Boardman, 2007).

Social comparison conceptualizations state that individuals can engage in upward or downward comparisons. In upward comparisons, they preferentially choose superior comparison targets, i.e., that are in a more favourable position in the domain in which they are comparing themselves. Upward comparison probably occurs when the motive of self-improvement is salient (Buunk & Gibbons, 2007; Wood, 1989). Despite its adaptive function, negative emotions often arise in this type of comparison (Buunk & Gibbons, 2007). In contrast, in downward comparison, the target is someone perceived as being worse off on a particular dimension; which is self-enhancing and self-protective (Gibbons & McCoy, 1991; Wills, 1981; Wood, 1989). For women, the process of appearance-focused social comparison can also be performed concerning various distinct social targets. One of the preferential targets refers to media images of women with thin and slender bodies (e.g., models, actresses or other celebrities), which represent idealized patterns of physical attractiveness. Most of those media universe images have extremely low weight and measures, which are hardly attainable by common women. In fact, studies show that the feminine beauty ideal has become progressively thinner (Wiseman, Gray, Mosimann, & Ahrens, 1992; Sypeck et al., 2006), contrasting with the increase of the Western women's weight mean. Given such discrepancy, it would be expected that those unrealistic images were considered irrelevant social comparison targets. However, women

frequently compare with them (Engeln-Maddox, 2005; Strahan et al., 2006), even when that leads to negative emotional and behavioural consequences (Tiggemann & McGill, 2004; Heinberg & Thompson, 1995; Irving, 1990; Stice & Shaw, 1994). This type of upward comparison can be justified by the fact that it offers valid information to assess more precisely one's appearance and is useful for self-improvement (Buunk & Gibbons, 2007). There is, through the comparison and scrutiny of those superior comparison targets, people become more able to adapt their own behaviours in order to become more similar to those targets. Moreover, those media images seem to be chosen as comparison targets because they represent a sociocultural norm according to which women believe that others will evaluate them (Heinberg & Thompson, 1995). Nevertheless, physical appearance comparison targets can also be selected from the proximal everyday world (Jones, 2001). In fact, women feel a great pressure from peers to be thin, especially when such comparison is made in a social context (Irving, 1990). In this case, the thin peer can be particularly threatening by representing a pattern one should be able to attain (Krones, Stice, Batres, & Orjada, 2005).

Data concerning the development and maintenance of eating disorders have demonstrated a positive significant association between body mass index (BMI), body dissatisfaction (BD) and disordered eating behaviours (Williamson, Netemeyer, Jackman, & Anderson, 1995), such as dieting, which, in turn, has been linked to eating pathology vulnerability (Cachelin & Regan, 2006; Polivy & Herman, 2002). However, other variables, such as social comparison, seem to play an important role in that process (Stormer & Thompson, 1996). Actually, individuals who frequently compare their own bodily appearance to 'more attractive' others, such as models in the media, are at greater risk for feeling dissatisfied with their body image and developing an eating disturbance (e.g., Irving, 1990; Corning, Krumm, & Smitham, 2006; Dittmar & Howard, 2004; Tiggemann, Polivy, & Hargreaves, 2009). Accordingly, Halliwell and Harvey (2006) found that the process of social comparison led to thin ideal internalization, BD and disordered eating for both male and female adolescents. Troop et al. (2003) also demonstrated that there is a significant association between unfavourable social comparison perceptions and eating disorder symptoms. Other studies show the relevance of social comparison and low social rank perceptions among patients with eating disorders, who commonly refer perceptions of inadequacy, and that others are superior and more powerful than them (Butow, Beumont, & Touyz, 1993; Williams et al., 1993).

Considering the importance of the social comparison process for psychological functioning, Allan and Gilbert (1995) developed a scale to assess the perception of social rank, attractiveness, and of feeling different and being an outsider. This scale was developed using a semantic differential methodology (Osgood, Suci, &

Tannenbaum, 1957), presenting participants with an incomplete sentence ('In relationship to others I generally feel...') followed by a series of bipolar constructs that tap global evaluations for comparisons (e.g., 'inferior-superior', 'less competent-more competent', 'likeable-less likeable'). The factor analysis showed that in a normal population, the perception of social attractiveness plays a role in both social rank and group fit judgments, and in clinical group, the analysis suggested a three-factor solution with the attractiveness dimension emerging as a separate factor. The Cronbach's alpha was .88. The authors found that favourable social comparisons negatively correlate with psychopathology dimensions.

The study of the comparison with others in relation to the research field of BD and disordered eating has mainly been focused on the tendency to compare the appearance domain or to perform upward or downward appearance-focused comparisons, examining the detrimental consequences of each kind of comparisons. Such associations have been examined in correlational studies, which use self-report brief measures to assess physical appearance comparisons, and in experimental methodologies, which attempt to induce such comparisons by exposing participants to a comparison figure, using often instruments that may not be well validated (Myers & Crowther, 2009).

One of the questionnaires that has been applied the most in the study of appearance-focused comparisons is the Physical Appearance Comparison Scale (PACS; Thompson, Heinberg, & Tantleff, 1991). The PACS is a five-item scale ($\alpha=.70$) that measures the tendency to make personal physical appearance comparisons with others in various social situations (e.g., 'In social situations, I sometimes compare my figure to the figures of other people'). The Body Comparison Measure (Fisher, Dunn, & Thompson, 2002; Thompson, Covert, & Stormer 1999) assesses how often individuals compare specific body parts (e.g., legs, lips) and feelings about general body shape and form, with same sex peers. On the basis of those scales, Tiggemann and McGill (2004) developed the Specific Attributes Comparison Scale ($\alpha=.81$). Other researchers focused on adapting and developing a measure that assessed upward and downward physical appearance comparisons – Upward and Downward Appearance Comparison Scales (O'Brien et al., 2009).

All of these scales focus on the tendency to make comparisons of the general physical appearance, body shape or specific body parts, but they do not focus on the assessment of social ranking based on one's physical appearance in comparison with the appearance of others. Thus, we created the SCPAS to assess the way subjects perceive themselves as social agents within their group having physical appearance as a reference. In fact, although it is consensual that, for women, the physical appearance domain is a key aspect on how they compare themselves with others, until now, an instrument that

specifically focus social ranking evaluation through the subjective comparison of physical appearance with others did not exist. This issue needs to be addressed given the fact that an individual can make unfavourable evaluations of his appearance in comparison with the appearance of others, and that may not significantly affect his social ranking evaluation, nor make him feel inferior or highly disturbed. So, we hypothesize that the degree in which the discrepancy between one's actual physical appearance and the one perceived as ideal leads to risk behaviours for eating pathology, such as a dieting (e.g., Polivy & Herman, 2002), might be influenced by how one sees the physical appearance as a mean to enhance one's social status and feel accepted and valued by the social group.

The SCPAS was developed and adapted from the Social Comparison Rating Scale (SCRS; Allan & Gilbert, 1995), maintaining its structure and tapping also the judgments concerned with rank, attractiveness and how a person judges himself or herself to fit in with or be like others. But, in this new scale, the items measure those ranking dimensions taking into account the physical appearance domain (e.g., 'When I physically compare myself with friends, colleagues and other known girls/models, actresses or celebrities I feel... Inferior/Superior, Left out/Accepted, Devalued/Valued'), and not comparisons of physical appearance in social contexts, like the existent remaining scales of appearance-focused comparison are designed to do (e.g., PACS; Thompson et al., 1991). The SCPAS was developed with the purpose of studying this processes having as a social comparison target, in the first part, the proximal group (peers) and, in the second part, a distal group representative of an ideal pattern of physical attractiveness (models, actresses and celebrities).

This paper aims to present the development and validation of this new social comparison assessment instrument, in a female sample from general population and its psychometric properties. Finally, we further examine whether social comparison through physical appearance mediates the empirically known relationship between current weight dissatisfaction and disordered eating, particularly the tendency to diet and seek thinness. There is, we hypothesize that although body weight dissatisfaction has an impact in the tendency to seek thinness, a lot of this of this effect is further explained by the role of social comparison. The same is to say that there is a higher tendency to engage in dieting when an individual feel that his 'not-ideal' body somehow puts him down or lessens his status in the group. Thus, the diet arises as an attempt to strive to gain/maintain one's social rank.

Thus, we expect that the evaluation of one's social rank using physical appearance as the comparison domain (with peers or with models), improves the overall variance accounted for the regression models and statistically decreases the magnitude of the influence of current weight dissatisfaction on disordered eating.

METHOD

Participants

Participants in this study were 828 women from Portuguese general population, with 662 undergraduate female students (80.0%), from several educational degrees, and 166 women recruited from normal population (20.0%). The participants' age mean is 22.72 (standard deviation [SD]=9.09), and the years of education mean is 12.47 (SD=2.85). Of the normal population subjects, 11.1% have middle class professions ($n=92$). And 86.7% of the subjects are single ($n=718$). The subjects BMI mean is 21.73 (SD=3.16).

A clinical sample of 91 female patients with an eating disorder was further used in the discriminant analysis. They present a mean age of 23.55 (SD=7.63) and of 12.41 (SD=3.01) years of education. Of the patients, 55.4% are students ($n=51$) and 82.6% are single ($n=76$). The patients present a BMI mean of 21.31 (SD=6.98). The clinical diagnoses were established by a semi-structured interview (Eating Disorder Examination 16.0; Fairburn, Cooper, & O'Connor, 2008): 27 (29.67%) presented anorexia nervosa (18 [19.78%] of the restricting subtype and 9 [9.89%] of the binge/purge subtype); 29 (31.87%) bulimia nervosa (17 [18.68%] of the purging subtype and 12 [13.19%] of the non-purging subtype), and 35 (38.46%) presented eating disorder not otherwise specified. Overall, 40 participants (43.96%) are of a restricting subtype, and 51 (56.04%) are of a binge/purge subtype.

Measures

Participants completed a battery of self-report questionnaires designed to measure social comparison through physical appearance, social comparison, external shame, psychopathology and eating disorders' symptoms, and dissatisfaction with current weight.

Demographic Data

Information included age, educational status, marital and professional status.

Body Mass Index Discrepancy (Body Mass Index—Real/Ideal)

We used the difference between the real BMI and the perceived ideal BMI as an objective measure of the dissatisfaction with the current body weight. We calculated participant's real BMI dividing the current weight (in kg) by height squared (in m), and the ideal BMI dividing the perceived desired weight (in kg) by height squared (in m) (i.e., using the formula Wt/Ht^2).

Social Comparison through Physical Appearance Scale

This scale was based on the original scale developed by Allan and Gilbert (1995) to measure social comparison but was adapted in order to assess the subjective perception of one's attractiveness, social ranking and group fit, according to the way one compares himself with others, using physical appearance as a reference. The instrument instructions were adapted by the authors aiming at the purpose of this scale, namely the development of its parts focused on the assessment of such social comparison processes relative to proximal targets (friends, colleagues and other known girls), and distal targets (models, actresses and other celebrities). Some items presented in each part were derived from the original SCRS (Allan & Gilbert, 1995), and the authors generated the others. They focused on designing items that tapped the aimed constructs (the perception of being an attractive social agent with a high status, and accepted/valued in his group) and their relation to BD. In addition, the first two authors suggested items based on clinical experience capturing the centrality of the social comparison process in eating pathology. These items were also discussed with patients with an eating disorder and with high levels of BD asking them if the items reflected their experience. Items that appeared to focus merely on the appearance/body shape comparison domain (e.g., thinner/fatter) were excluded. Each part comprised 12 items.

The participants were instructed to select a number, using a Likert scale ranging from 1 to 10, which best translated the way they feel in relation to other people. In each part of the scale, they were asked to complete the sentence 'When I compare physically with my colleagues, friends or other known girls [part one]/models, actresses or other celebrities [part two] I feel' corresponding each item extreme to bipolar constructs. Higher scores represent more favourable comparisons.

When I physically compare myself with my colleagues, friends or other known girls, I feel:

Inferior	1	2	3	4	5	6	7	8	9	10	Superior
Unattractive	1	2	3	4	5	6	7	8	9	10	More attractive
Undesirable	1	2	3	4	5	6	7	8	9	10	More desirable

...

When I physically compare myself with models, actresses or other celebrities, I feel:

Inferior	1	2	3	4	5	6	7	8	9	10	Superior
Unattractive	1	2	3	4	5	6	7	8	9	10	More attractive
Undesirable	1	2	3	4	5	6	7	8	9	10	More desirable

...

Social Comparison Rating Scale (Allan & Gilbert, 1995; Portuguese version by Gato, 2003)

This scale was developed to measure self-perceptions of social rank and relative social standing. It is constituted by 11 items of bipolar constructs (e.g., inferior/superior),

using a semantic differential methodology. Participants make a global comparison of themselves in relation to others and rate themselves on a 10-point Likert scale. The scale comprises judgments concerned with rank, attractiveness and how well people think they 'fit in' their social group. It has good reliability, with Cronbach's alphas of between .88 and .96 with clinical populations, and between .90 and .91 with student populations (Allan & Gilbert, 1995). The Cronbach's alpha of the total scale for the present study is .89.

Eating Disorders Inventory (Garner, Olmsted, & Polivy, 1983; Portuguese version of Machado, Gonçalves, Martins, & Soares, 2001)

This scale is a self-report comprehensive methodology of behavioural and psychological eating disorders dimensions. It is one of the most used and rigorous scales for this purpose and can be used as a diagnostic measure. It comprises 64 items subdivided in eight subscales, assessing weight, shape and eating-related attitudes and behaviours, and psychological characteristics common in patients with eating disorders. Using a six-point Likert scale (ranging from 'always' to 'never'), respondents rate how much each item applied to them. In the current study, we focused on the drive for thinness (DFT), bulimia (BUL) and BD subscales, which present adequate internal consistency coefficients and are well validated (Garner et al., 1983). In the Portuguese version, they present good to very good internal consistency (DFT=0.91; BUL=0.81; BD=0.91) (Machado et al., 2001). The coefficient alphas for this sample were .80 (DFT), .58 (BUL) and .90 (BD).

Other as Shamer Scale (Goss, Gilbert, & Allan, 1994; Portuguese version by Matos, Pinto-Gouveia, & Duarte, 2011)

This scale was devised to measure external shame, that is, thinking that others look down on, and negatively evaluate the self (Goss et al., 1994). Participants are asked to rate the 18 items on a five-point Likert scale (0='never' to 4='almost always') according to the frequency they make certain evaluations about how others judge them. In the original study, the scale showed good reliability, with a Cronbach's alpha of .92 (Goss et al., 1994). In the present study, we obtained a value of .94.

Depression, Anxiety and Stress Scales (Lovibond & Lovibond, 1995; Portuguese version of Pais-Ribeiro, Honrado, & Leal, 2004)

This scale includes three subscales (of 14 items each) designed to measure levels of depression (DEP), anxiety (ANX) and stress (STR). The point is to obtain an estimate of how much the subjects experienced each symptom during the previous week in a four-point Likert scale. Higher results indicate higher levels of emotional distress. The Cronbach's alpha of the Portuguese version resembles

the original ones: .93 for DEP (.91 in the original version), .83 for ANX subscale (.84) and finally .88 for STR subscale (.90). In the present study, the Cronbach's alpha values were of .96, .92 and .94, respectively.

Eating Disorder Examination 16.0 (Fairburn et al., 2008; Psychometric studies by Ferreira, Pinto-Gouveia, & Duarte, 2010)

Eating Disorder Examination 16.0 is a standardized interview that can be used for diagnosing eating disorders based on the Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition, Text Revision (American Psychiatric Association, 2000) criteria, and allows the assessment of the frequency and intensity of behavioural and psychological aspects of eating disorders, such as restriction habits, eating concerns, and weight and shape concerns. It is considered a precise evaluation method with high values of internal consistency, of test-retest reliability and of discriminative and concurrent validity (see Fairburn (2008) for a review).

Procedure

Participants were fully informed about the purpose of the study, the procedures involved, that their cooperation was voluntary and that the data were confidential. The battery with the measures described above was administered by the authors and completed by the students at the end of a lecture, with previous knowledge and authorization of the professor in charge, and with the approval by the Ethics Committee of the educational institutions. The women from normal population comprised a convenience sample collected within the staff of different institutions and private corporations (e.g., schools, hospitals, and companies' staff). All the involved institutions' boards were contacted, the research aims were clarified and authorization was obtained so that the subjects could voluntarily participate.

The eating disorder sample was recruited in the University of Coimbra Hospitals, São Teotónio Hospital in Viseu and São João Hospital in Porto, Portugal (with previous consent of the respective Ethics Committee), and in private clinics. They also completed the same battery of self-report questionnaires and additionally participated in the Eating Disorder Examination 16.0 interview (Fairburn et al., 2008), which was administered by clinical researchers with previous training and supervision.

Analytic Strategy

Principal components factor analysis with varimax rotation was carried out on each part of the scale on the non-clinical population data. Internal consistency was evaluated by computing Cronbach's alphas for the Part A: peers and for the two factors obtained, and for the Part B: models. Also,

item-total correlations were computed for each of the items comprising the respective part of the scale. Concurrent and divergent validity of the SCPAS Part A: peers and B: models were assessed by computing Pearson product-moment correlation coefficients. Retest reliability was analysed by *t*-tests for dependent samples comparing the first and second administration mean values of the scale, and by Pearson product-moment correlations. The results for each of the clinical and non-clinical samples were compared using *t*-tests for two independent samples.

Finally, in the mediator analysis, the predictor variable was BMI—real/ideal; the dependent variable was DFT, as measured by Eating Disorders Inventory (EDI); and social comparison through physical appearance (with peers and models), measured by SCPAS, was assumed to be the mediator. Linear regression models were used to test the effects of the mediator on the relationship between the independent and the dependent variable.

RESULTS

Preliminary Data Analyses

Preliminary data analyses were performed to examine the violation of test assumptions. The normality of variables was assessed by the *Kolmogorov-Smirnov* Test. We also analysed the values of *Skewness* and *Kurtosis* obtained. Distribution of the variables scores was biased from normal curve, but the values of *Skewness* and *Kurtosis* were between -0.4 and 0.4 (with the exception of *Bulimia* subscale), which, according to Kline (1998), does not represent a serious bias. Also, the visual inspection of the distributions provided support for not considering the issue (Maroco, 2007; Tabachnick & Fidell, 2007).

Factor Structure of Social Comparison through Physical Appearance Scale

For the study of the dimensional structure of the Part A: peers, we used the same procedure as the authors of the original Social Comparison Rating Scale (SCRS; Allan & Gilbert, 1995), proceeding to principal component analysis, followed by varimax rotation. We confirmed the suitability of the data for posterior analysis using the Kaiser Meyer-Olkin Test (0.941) and the Bartlett's Test of sphericity ($\chi^2_{(66)}=7926.505$; $p \leq 0.001$). We further used the Kaiser-Guttman criteria, and also the Catell's Scree Test. The results revealed two factors with eigenvalues greater than one. Furthermore, we used the Scree Test, considered as a more reliable measure to choose the number of factors, which revealed a clear structure of two factors, labelled *Attractiveness/Rank* and *Group Fit*.

The principal component analysis showed that all items present communalities above 0.50. All items loaded on to

Table 1. Factor analysis—Social Comparison through Physical Appearance Scale part A: peers ($n=828$)

Items	1	2	h^2
Attractiveness/Rank			
2. Unattractive—more attractive	0.871	0.280	0.838
1. Inferior—superior	0.859	0.181	0.771
11. Less elegant—more elegant	0.824	0.243	0.738
3. Undesirable—more desirable	0.812	0.356	0.786
5. Ugly—beautiful	0.724	0.393	0.679
4. Unconfident—more confident	0.712	0.429	0.690
12. Despised—envied	0.627	0.324	0.498
10. Less popular—more popular	0.623	0.460	0.599
Group Fit			
7. Left out—accepted	0.347	0.851	0.844
6. Different—same	0.188	0.807	0.686
8. Devalued—valued	0.402	0.803	0.807
Eigenvalues	6.882	1.054	

h^2 = communalities values.

the respective factor with loadings of 0.45 or above, except item 9 ('ignored—looked up') that loaded onto the two factors with a difference inferior to 0.15, and was excluded from further analysis. Table 1 gives the items and factor loadings from the structure matrix.

The two-factor structure explains 72.142% of the variance, with the first factor—*Attractiveness/Rank*—explaining 62.560%, and the second—*Group Fit*—explaining 9.582%.

For the study of the dimensional structure of the SCPAS Part B: models, we used the same procedure and took into account the same criteria used in the previous analysis. Kaiser Meyer-Olkin Test (0.949) and the Bartlett's Test of Sphericity ($\chi^2_{(66)}=9422.039$; $p \leq 0.001$) also confirmed that factor analysis could proceed. The Kaiser-Guttman criteria pointed out the existence of one factor. Moreover, the Scree Test clearly pointed to a one-dimensional structure, which was confirmed by the matrix that revealed that all items had factor loadings superior to 0.73.

Table 2 gives the items and factor loadings from the structure matrix of SCPAS Part B: models. The one-dimensional structure explains a total of 69.191 % of the variance.

Reliability Analysis

Table 3 presents the means, standard deviations and the internal reliability coefficients of the SCPAS. Results show a very good internal reliability (Nunnally & Bernstein, 1994). In the Part A: peers, the two dimensions show internal reliability values of 0.933 for *Attractiveness/Rank* and 0.855 for *Group Fit*. All items in this part present item-total correlation coefficients of 0.63 or above, pointing out the quality and suitability of the items for each subscale. In fact, were obtained values that vary between 0.627 (item 6: 'different—same') and 0.863 (item

Table 2. Factor analysis—Social Comparison through Physical Appearance Scale part B: models ($n=828$)

Items	1	h^2
3. Undesirable—more desirable	0.882	0.778
2. Unattractive—more attractive	0.875	0.766
9. Ignored—looked up	0.855	0.731
4. Unconfident—more confident	0.850	0.723
7. Left out—accepted	0.846	0.716
8. Devalued—valued	0.846	0.715
5. Ugly—beautiful	0.843	0.711
11. Less elegant—more elegant	0.836	0.699
1. Inferior—superior	0.822	0.676
12. Despised—envied	0.819	0.671
10. Less popular—more popular	0.766	0.587
6. Different—same	0.729	0.531
Eigenvalues	8.303	

h^2 = communalities values.

Table 3. Means and standard deviations, and reliability ($n=828$)

	M	SD	α	Test-retest (r) ($n=57$)
Social Comparison through Physical Appearance Scale	64.66	14.63	.936	0.720**
Part A: peers				
Attractiveness/rank	45.25	10.65	.933	0.771**
Group fit	19.41	5.09	.855	0.530**
Part B: models				
Social Comparison through Physical Appearance Scale	58.41	17.10	.958	0.823**

** $p < 0.001$.

2: 'unattractive—more attractive'). All single items are associated with the totality of each subscale, with values that vary between 0.638 and 0.863 (for the dimension *Attractiveness/Rank*) and 0.627 and 0.809 (for the dimension *Group Fit*). Pearson product-moment correlation coefficients showed that those subscales are moderately and positively correlated ($r=0.689$; $p < 0.01$).

Results reveal a very good internal reliability for the Part B: models. All of the items present values ranging from 0.684 (item 6: 'different—same') and 0.851 (item 3: 'undesirable—more desirable').

Retest Reliability

Fifty-seven participants, randomly selected from the original sample, completed the retest of Part A and Part B after a 4-week interval. Both parts of the scale had good test-retest reliability (Table 3).

Social Comparison through Physical Appearance Scale in Relation To Other Measures

The concurrent and divergent validity of the SCPAS Part A: peers and B: models were evaluated with measures of

social comparison, external shame, depression, anxiety and stress symptoms, and eating disorders symptoms.

The results given in Table 4 show that the *Attractiveness/Rank* and *Group Fit* subscales and the total scale of the Part A: peers were positively correlated, with moderate to high magnitudes, with SCRS and the respective subscales *Rank* and *Group Fit*. They were negative and moderately correlated with external shame. And they were also negatively correlated, in low to moderate magnitudes, with DEP, ANX and STR symptoms. They negatively correlated to DFT and BUL and, with a higher magnitude, to BD.

The SCPAS Part B: models revealed positive moderate correlations with SCRS total and its subscales *Attractiveness* and *Group Fit*. It was negative and moderately correlated with external shame (OAS). Negative correlations were found, ranging from low to moderate, with DEP, ANX and STR. The scale was also negatively correlated with DFT, BUL, and, in a higher magnitude, with BD.

The two parts of the scale, and the subscales of the Part A: peers, are negatively correlated with the dissatisfaction with current weight.

Social Comparison through Physical Appearance Scale in Eating-Disorders Patients

We compared the values obtained by a smaller sample from general population ($n=102$, randomly selected from the original sample) with those obtained by a clinical

Table 4. Correlations (2-tailed Pearson r) between Social Comparison through Physical Appearance Scale peers and models and Social Comparison Rating Scale, Other as Shamer Scale, Depression, Anxiety and Stress Scales subscales, Eating Disorders Inventory subscales and body mass index—real/ideal ($n=828$)

Factors	Attractiveness/ rank	Group fit	Part A: peers	Part B: models
SCRS	0.729**	0.688**	0.769**	0.558**
SCRS (Rank)	0.682**	0.525**	0.678**	0.534**
SCRS (Group Fit)	0.510**	0.697**	0.614**	0.399**
OAS	-0.493**	-0.490**	-0.523**	-0.418**
DASS42 (DEP)	-0.447**	-0.457**	-0.481**	-0.410**
DASS42 (ANX)	-0.294**	-0.296**	-0.315**	-0.269**
DASS42 (STR)	-0.341**	-0.326**	-0.359**	-0.342**
EDI (DFT)	-0.284**	-0.169**	-0.265**	-0.333**
EDI (BUL)	-0.213**	-0.159**	-0.210**	-0.191**
EDI (BD)	-0.480**	-0.300**	-0.454**	-0.451**
Body mass index— real/ideal	-0.275**	-0.175**	-0.257**	-0.243**

DASS42 = Depression (DEP), Anxiety (ANX) and Stress (STR) Scales. EDI = Eating Disorder Inventory. DFT = Drive for Thinness. BUL = Bulimia. BD = Body Dissatisfaction. OAS = Other as Shamer. SCRS = Social Comparison Rating Scale.

** $p < 0.001$.

sample of 91 patients with an eating disorder (Table 5). The two samples did not significantly differ in what concerns the referred demographic variables.

The eating disorder patients perform social comparisons through physical appearance that are significantly more unfavourable, comparatively with subjects from normal population, in both Part A: peers, and its subscales, and Part B: models.

Additionally, we compared the scores of the Restricting ($n=40$) and the Binge/Purging ($n=51$) subtypes of the eating disorder sample. There are no significant differences between the two samples in the SCPAS: peers and SPCAS: models.

The Mediator Effect of Social Comparison through Physical Appearance on the Relationship Between the Dissatisfaction with Current Weight and Drive for Thinness

To better understand the contribution of the SCPAS for the conceptualization of disordered eating, we sought to explore the mediational function of social comparison through physical appearance (with peers and models) on the relationship between the dissatisfaction with current weight (BMI—real/ideal) and DFT. Taking into account that disordered eating occurs in a continuum from general population to cases of clinical significance, we decided to gather the clinical and the non-clinical sample ($n=919$) to conduct such analyses. The distribution of variables scores was biased from normal curve, but the values of *Skewness* and *Kurtosis* ranged between -0.5 and 0.7 , which are acceptable values (Kline, 1998).

A series of tests were also carried out to examine the suitability of the current data for regression analyses. The analyses of residuals scatter plots (which provides a test of assumptions of normality, linearity and homoscedasticity between dependent variable scores and errors of prediction) showed that the residuals were normally distributed, had linearity and homoscedasticity. Also, the independence of the errors were analysed and validated through graphic analysis and the value of *Durbin-Watson* (values were between 1.470 and 1.598). There was no evidence of the presence of multicollinearity or singularity among the variables, because the Variance Inflation Factor

(VIF) values indicated the absence of β estimation problems ($VIF < 5$). Overall, the results indicated that these data are adequate for regression analyses.

Analysis testing for the mediating effect of social comparison through physical appearance followed the linear regression model by Baron and Kenny (1986). According to them, a variable functions as a mediator when it meets the following conditions: (i) dissatisfaction with current weight (predictor variable) significantly regresses with DFT (dependent variable); (ii) dissatisfaction with current weight (predictor variable) significantly regresses with social comparison through physical appearance (peers and models) (mediator); and (iii) dissatisfaction with current weight (predictor variable) and social comparison through physical appearance (mediator) significantly regress on the outcome (DFT). The final step of the mediation should demonstrate a significant reduction in the predictive relation of dissatisfaction with current weight on DFT, after accounting for the variance attributed to social comparison through physical appearance, when it is added to the model. We further analysed the amount of mediation—indirect effect—using the Sobel Test, which determines the significance of the indirect effect of the predictor variable on the outcome, through its effect on the mediator.

A regression analysis was conducted with BMI—real/ideal as the independent variable and DFT as the dependent variable. The model was significant ($F[1,916]=91.245$; $p \leq 0.001$), accounting for 9.0% of DFT ($\beta = .301$; $p \leq 0.001$). We further examined whether BMI—real/ideal predicted SCPAS peers. The model was also significant ($F[1,916]=64.772$; $p \leq 0.001$) with $\beta = -.257$ ($p \leq 0.001$). Finally, a regression analysis was performed to determine whether the proposed mediator significantly predicted DFT. We entered with BMI—real/ideal and with SCPAS peers as the independent variables and with DFT as the dependent variable. The final model was significant ($F[1,915]=193.722$; $p \leq 0.001$), accounting for 24.8% of DFT. These results indicated that when the mediator is added in the model, β reduces for .195 ($p \leq 0.001$). The indirect effect of BMI—real/ideal on DFT (through its effects on SCPAS peers) was tested using the Sobel Test that indicated that SCPAS peers partially mediates the relationship between BMI—real/ideal and DFT ($z = -7.84$; $p \leq 0.001$) (Table 6).

Table 5. Means, standard deviations and t -test differences between general population and Eating Disorder sample; and between the restricting and binge/purging subtype of the Eating Disorder sample

	General population		Eating Disorder sample		t	p	Restricting		Binge/purging		t	p
	$(n=102)$		$(n=91)$				$(n=40)$		$(n=51)$			
	M	SD	M	SD			M	SD	M	SD		
Part A: peers	65.22	13.84	39.65	17.72	11.075	0.000	43.13	18.65	36.92	16.63	1.674	0.098
Attractiveness/rank	45.75	10.25	27.51	12.61	10.945	0.000	29.83	12.91	25.69	12.18	1.567	0.121
Group fit	19.47	5.06	12.14	5.84	9.338	0.000	13.30	6.31	11.24	5.34	1.690	0.095
Part B: models	59.65	15.66	32.32	18	11.191	0.000	36.15	19.67	29.31	16.14	1.821	0.072

We further explored whether BMI—real/ideal significantly predicted SCPAS models. The model was significant ($F[1,916]=57.295; p \leq 0.001$) with $\beta = -.243$ ($p \leq 0.001$). Also, we conducted a regression analysis to determine if SCPAS models (mediator) significantly predicted DFT, following the previous procedures. The final model was significant ($F[1, 915]=230.495; p \leq 0.001$), accounting for an additional 27.2% of DFT. Results showed that when the mediator is added in the model, β reduces for .194 ($p \leq 0.001$). Sobel Test was significant ($z = -8.01; p \leq 0.001$) also indicating that SCPAS models partially mediates the effect of BMI—real/ideal on DFT (see Table 6).

In further regression analyses, we included SCRS as a covariate and results showed that considering the beta values and semi-partial correlations, in the first analysis ($F[3,912]=101.115; p \leq 0.001$) when SCRS is controlled for, SCPAS peers remains the best global predictor of DFT ($\beta = -.408; p \leq .001; Sr = -0.227$), followed by BMI—real/ideal ($\beta = .197; p \leq 0.001; Sr = 0.189$), and SCRS was non-significant ($\beta = -.004; p = 0.939; Sr = -0.002$); in the second analysis ($F[3,912]=117.453; p \leq 0.001$), when SCRS is controlled for, SCPAS models remains the best global predictor of DFT ($\beta = -.382; p \leq 0.001; Sr = -0.284$), followed by BMI—real/ideal ($\beta = .196; p \leq 0.001; Sr = 0.191$), and SCRS presented the lowest predictive power ($\beta = -.089; p = 0.017; Sr = -0.067$).

DISCUSSION

It is recognized that social comparison is a fundamental process for human beings, enabling the knowledge of one's relative social rank (Buunk & Gibbons, 2007; Festinger, 1954; Gilbert et al., 1995). Clinical and empirical data show that an unfavourable social comparison plays an important role in psychological functioning, and also in the eating disorders process (e.g., Butow et al., 1993; Williams et al., 1993; Troop et al., 2003). Thus, the

evaluation of the process of social comparison through physical appearance becomes a crucial aspect for research and clinical practice in the eating disorders' field. This study aimed at developing a measure of Social Comparison through Physical Appearance, a self-report scale that enables, in a brief, valid and reliable way, to access how subjects perceive themselves in a social context, having as a reference their physical appearance. It intended to further explore its association with social comparisons and with levels of external shame, psychopathology indicators, eating disorders' symptomatology and dissatisfaction with current weight.

In what concerns the psychometric qualities of the SCPAS, a study was conducted in a large female sample from general population. The first part of the scale (Part A: peers) revealed a factorial structure similar to the one found by Gilbert et al. (1995) in the development of the SCRS. This study produced two factors, accounting for 72.142% of the variance, with the first one—*Attractiveness/Rank*—accounting 62.560% and the second one—*Group Fit*—accounting 9.582%. The first factor comprises eight items that measure the perception of attractiveness and ranking within the group, and the second one comprises three items and refers to the perception of fitting and being valued in the group one belongs to. The second part (Part B: models) emerged as a one-dimensional structure, constituted by 12 items that accounted 69.191% of the variance. The difference between the factor structure in each part of the scale can be understood considering that upward comparison with a superior and distant target do not imply a judgement in terms of fitting or not in the group the target belongs to (e.g., models, celebrities) but gives an ideal measure of physical attractiveness valued by Western societies (Heinberg & Thompson, 1995). Thus, in the factorial analysis of the scale's part measuring social ranking when physically comparing with models, actresses or celebrities (i.e., an upward and

Table 6. Mediation effect of social comparison through physical appearance (mediator) in the relationship between dissatisfaction with current weight and drive for thinness ($n=919$)

	β	t	p	F	p	Adjusted R^2	ΔR^2
Body mass index—real/ideal (VD=DFT)	0.301	9.552	0.000	91.245	0.000	0.090	
Body mass index—real/ideal (VD=SCPAS peers)	-0.257	-8.048	0.000	64.772	0.000	0.065	
Body mass index—real/ideal SCPAS peers (VD=DFT)	0.195 -0.412	6.579 -13.918	0.000 0.000	193.722	0.000	0.248	0.159
Body mass index—real/ideal (VD=SCPAS models)	-0.243	-7.569	0.000	57.295	0.000	0.059	
Body mass index—real/ideal SCPAS-Models (VD=DFT)	0.194 -0.441	6.679 -15.182	0.000 0.000	230.495	0.000	0.272	0.183

DFT = drive for thinness. SCPAS = Social Comparison through Physical Appearance Scale.

distal social group) the Group Fit factor, as expected, did not appear as a salient dimension.

Internal reliability coefficients in the Part A: peers and its subscales, and in the Part B: models, were high, indicating that this instrument has a good reliability. Furthermore, the correlation study between the two subscales (Attractiveness/Rank and Group Fit) of the Part A: peers, show that they positively correlate, with a moderate magnitude, reflecting related but distinct constructs.

Convergent reliability studies with various measures of social ranking and psychopathology allowed us to verify positive significant associations between Part A: peers and Part B: models and the measure of social comparison, and negative significant associations with shame, general psychopathology measures (DEP, ANX and STR), of eating disorders (DFT, BUL and BD) and dissatisfaction with current weight. These findings are in accordance with the research focusing on the social comparison process and its association to negative affect and psychopathology (e.g., Gilbert et al., 1995), and on the role that perceiving the self as less attractive than others, plays in the eating disorders' process (Troop et al., 2003).

The sensitivity of the scale (Part A: peers and its subscales and Part B: models) in discriminating between a group of patients with an eating disorder and a group of participants from general population, was established, revealing significant differences between them. In fact, the patients presented more unfavourable social comparisons through physical appearance, either with peers, or with images that represent an ideal pattern for physical appearance, as social comparison targets. Additionally, we tested the existence of differences between the Restricting and Binge/Purging subtype of the eating disorder sample, and data show that the two subtypes do not significantly differ in the assessed dimensions, which support the assumption that, overall, eating disorder patients perceive themselves as being in an inferior social ranking when comparing themselves with others (either with proximal or distant comparison targets). This result can be understood given that the overvaluation of body image and the disproportional use of the physical appearance as a measure of one's self-worth are fundamental characteristics of patients diagnosed with eating disorders, regardless of their typology (Fairburn, 2008).

Finally, SCPAS shows a good temporal stability.

In addition, this study sought to verify this new scale contribute in the research on disordered eating. Thus, we aimed to explore the mediator effect of social comparison through physical appearance on the relationship between the dissatisfaction with current weight and disordered eating, namely dieting behaviours (DFT). Given the role that the perception of a lower social ranking plays in psychopathology, particularly among eating disorders' patients (e.g., Troop et al., 2003), we predicted that the inclusion of this construct would improve the overall

accounted variance and decrease the magnitude of the influence of the dissatisfaction with current weight on DFT. That is, we aimed at understanding if the appearance-based social ranking perceptions would influence how the dissatisfaction with current weight affects DFT.

Our findings empirically supported such assumption. In fact, the mediator analyses showed that a perception of a high discrepancy between one's current weight and the desired weight was associated with a higher tendency to DFT, via how physical appearance is taken as a salient domain to establish one's social rank. These results were corroborated by further analysis that showed that this construct adds above and beyond a global measure of social ranking in predicting DFT, and suggest that the dissatisfaction with the current weight does not necessarily lead to disordered eating, and that other processes, such as the attribution of a social status based specifically on the physical appearance, are likely involved in such relation. This adds to the existent knowledge (e.g., Williamson et al., 1995) by confirming, therefore, that the extent in which disordered eating derives from weight and BD is further explained by the meaning attributed to physical appearance as a defining variable of the place one occupies and how one fits in the social group. However, one important limitation of this study is its cross-sectional nature, which cannot allow us to assume a causality effect between the studied variables.

Because this is the first study of the factorial structure of this new measure in a large sample of female participants from Portugal, further work is needed to validate the scale and corroborate the present results. Besides, recognizing the inherent limitations underlying an exploratory factorial analysis, it becomes essential that new studies validate the scale using general samples and confirmatory factor analysis to investigate whether the factor structure identified in the two parts of this scale is stable. Also, these results allowed us to confirm that physical appearance is, for women, one of the salient dimensions in determining their relative social rank (Butow et al., 1993; Williams et al., 1993; Troop et al., 2003). However, given that the sample used in this study is mostly constituted by student, young and single women, the validity of generalizations of these results is reduced. Thus, we find important that future studies explore whether this dimension emerge with the same relevance degree in social comparison between women from different age ranges and other cultures. Furthermore, we consider that although this scale was designed and developed for female samples, it could be adapted, with minor modifications, and applied to male samples. Thus, the structure should be maintained, but the instructions could be adapted (e.g., 'When I physically compare myself with my colleagues, friends or other known men, I feel' [Part A], 'When I physically compare myself with actors, athletes and other famous men, I feel' [Part B]).

In summary, SCPAS is a brief and valid measure that allows the assessment of how individuals perceive themselves in a social context, having as a reference their physical appearance, even when they compare themselves with a proximal comparison target (friends, colleagues and other known girls) or a distal one (models, actresses or other celebrities). We consider that this construct may be particularly useful to investigate the relation between contextual and cultural variables, and personal vulnerabilities to eating disorders.

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