



Empirical Articles

Social Comparison in Parents of Children With Chronic Conditions: Results From the Portuguese Version of the Iowa-Netherlands Comparison Orientation Measure

Resultados da versão Portuguesa do Iowa-Netherlands Comparison Orientation Measure (INCOM) com pais de crianças com condições crónicas

Teresa Mendes*^a, Carla Crespo^b, João Marôco^c, Abraham Buunk^d, Joan Austin^e

[a] Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra, Coimbra, Portugal. [b] Faculdade de Psicologia da Universidade de Lisboa, Lisboa, Portugal. [c] Psychology and Health Research Unit, Instituto Superior de Psicologia Aplicada (ISPA-IU), Lisboa, Portugal. [d] Department of Psychology, University of Groningen, Groningen, The Netherlands. [e] Indiana University School of Nursing, University of Indiana, Indianapolis, USA.

Abstract

Aim: The Iowa-Netherlands Comparison Orientation Measure (INCOM) is a measure for assessing individual differences in social comparison orientation. Despite the relevance of social comparison orientation in understanding adult patients' adjustment responses to chronic health conditions, the impact of parental social comparison processes in the context of chronic pediatric conditions remains unexplored. This study's main goal was to examine the psychometric properties of the Portuguese version of the INCOM with parents of children with chronic health conditions.

Method: Two samples of parents of children with chronic pediatric conditions (asthma, epilepsy, diabetes and obesity) were used (test sample, N = 301; validation sample, N = 192). Parents completed self-reported measures of social comparison orientation, anxiety and depression symptoms and neuroticism.

Results: Regarding factorial validity, results supported the unidimensionality of a revised INCOM scale, comprised of nine items. Results also supported the reliability of the measure, and provided evidence of concurrent validity: parents with higher social comparison orientation presented more anxiety and depressive symptoms, and higher neuroticism scores, consistent with what was theoretically expected.

Conclusion: This study opens an important door in the field of pediatric chronic conditions, supporting the relevance of examining parents' social comparison differences in future research, and the utility of the INCOM in the assessment of those differences.

Keywords: INCOM, social comparison orientation, pediatric chronic conditions, parents, psychometric properties

Resumo

Objetivo: O Iowa-Netherlands Comparison Orientation Measure (INCOM) é uma medida para avaliar as diferenças individuais na orientação para a comparação social. Na compreensão do ajustamento psicossocial de doentes adultos com condições crónicas de saúde, os processos de comparação social tem-se relevado importantes determinantes. Permanece por explorar a importância destes processos no contexto das condições crónicas pediátricas. O principal objetivo deste estudo consiste em analisar as propriedades psicométricas da versão Portuguesa do INCOM com pais de crianças com condições crónicas de saúde.

Método: Foram utilizadas duas amostras de pais de crianças com condições crónicas pediátricas (asma, diabetes, epilepsia e obesidade) (amostra teste, N = 301; amostra de validação, N = 192). Os pais preencheram questionários de comparação social, neuroticismo e sintomatologia ansiosa e depressiva.

Resultados: Os resultados apoiam a unidimensionalidade da versão revista da INCOM, composta por 9 itens, a fiabilidade da escala, e a respetiva validade concorrente: pais com níveis superiores de comparação social evidenciam maior sintomatologia ansiosa e depressiva, e níveis superiores de neuroticismo, consistente com o esperado teoricamente.

Conclusão: Este estudo abre oportunidades de investigação futura ao atestar a relevância de examinar as diferenças na orientação para a comparação social entre os pais de crianças com condições crónicas pediátricas, e a utilidade da INCOM na avaliação dessas diferenças.

Palavras-Chave: INCOM, orientação para a comparação social, condições crónicas pediátricas, pais, propriedades psicométricas

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*Corresponding author at: Faculdade de Psicologia e Ciências da Educação, Universidade de Coimbra, Rua do Colégio Novo, Apartado 6153, 3001-802 Coimbra, Portugal. E-mail: teresapmendes@gmail.com



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Social comparisons are considered a central source of information concerning the self, which allow people to assess their abilities and the accuracy of their thoughts and behaviors (Gibbons & Buunk, 1999). When faced with situations of prolonged uncertainty and high stress, people show an increased tendency to make social comparisons and to relate their own situation to the situation of others who they regard as similar or who are facing similar life circumstances (Buunk et al., 2012; Gibbons & Buunk, 1999). Social comparisons can be used for self-improvement, as an aid in identifying appropriate responses to challenging situations or as an important mean to increase emotional well-being (Bennenbroek, Buunk, van der Zee, & Grol, 2002). However, social comparisons can also have negative affective consequences, for instance when people perceive themselves as worse off than similar others, or fear that they may end up like others worse off than themselves (Bennenbroek et al., 2002; White, Langer, Yariv, & Welch, 2006). In the context of chronic health conditions, extensive research has shown that adult patients actively seek first-hand information from fellow patients, which impacts on how they feel about and evaluate their personal situation, namely in terms of severity, prognosis or coping ability (e.g., Arigo, Suls, & Smyth, 2014; Davison, Pennebaker, & Dickerson, 2000).

Despite wide recognition of social comparison as a critical component of all social behaviors and interactions in health contexts, applications in the pediatric field remain largely unexplored. It is estimated that between 13 and 27% of the children in western countries show a chronic health condition (e.g., epilepsy, asthma, diabetes, obesity; Bethell, Read, Blumberg, & Newacheck, 2008). There are substantial communalities in the concerns and challenges faced by families across disease entities (Stein, Bauman, Westbrook, Coupey, & Ireys, 1993). Irrespective of their child's diagnosis, parents are at the front line for effective daily management of their child's chronic condition, which include tasks like: administration of medication, following dietary prescriptions, implementing lifestyle modifications, imposing activity restrictions, guaranteeing attendance at routine clinic appointments or active participation in decision making with the healthcare team (American Academy of Pediatrics, 2003). Treatment requirements may imply changes in the roles and responsibilities within the family system and may interfere with the daily life patterns and routines of individual family members and families as a whole (Mendes, Crespo, & Austin, 2016). Moreover, a substantial number of children who live with a chronic illness, and their family members, are at increased risk of experiencing emotional and social difficulties (Wallander & Varni, 1998). Meeting their child's special health needs represents a source of additional burden and uncertainty for parents (Mendes et al., 2016). Under these challenging circumstances, parents may actively or inadvertently engage in comparison processes when waiting for their children's clinical appointments, during conversations with their children's pediatrician, when consulting internet sites and educational materials, or when talking to other parents (Hodges & Dibb, 2010). Searching for and listening to comparison information from fellow fami-

lies enables parents to evaluate the seriousness of their child's current and future health status, or how well they are dealing with their child's illness and treatment (Buunk et al., 2012; Hodges & Dibb, 2010). But while some comparisons may give hope for the future, they may also be upsetting, especially when the parents believe that their child will never do as well as those with whom the comparisons are made (Blanchard, Blalock, DeVellis, DeVellis, & Johnson, 1999; Hodges & Dibb, 2010). The identification of individual variables that influence adjustment outcomes of family members across pediatric chronic illnesses may be particularly useful for health care providers since it allows the identification of high-risk populations (Wallander & Varni, 1998).

Previous research shows that people in general differ in the extent to which, and the frequency with which, they compare themselves with others (Gibbons & Buunk, 1999). This personality disposition has been labeled as social comparison orientation. This notion led Gibbons and Buunk (1999) to develop the Iowa-Netherlands Comparison Orientation Measure (INCOM), a short measure comprising 11 items. The original validation studies of the INCOM were performed simultaneously in the Netherlands and the USA. Cronbach alphas ranged from .78 to .85 across 22 samples (Gibbons & Buunk, 1999). The validity of the measure was supported by moderate significant relationships with measures of self-monitoring, public and private self-consciousness, neuroticism, and social anxiety in the English and Dutch language versions, as well as in a Spanish language version (Buunk, Belmonte, Peiró, Zurriaga, & Gibbons, 2005; Gibbons & Buunk, 1999). Yet, while the INCOM has been used in studies in different areas of knowledge (e.g., organizational, educational, adult chronic health conditions) and in diverse western and eastern cultural and linguistic contexts (e.g., Buunk et al., 2005; Kim, Jang, Kim, Choi, & Park, 2011; Schneider & Schupp, 2014), there is scarce reporting of its psychometric proprieties.

One shortcoming in extant psychometric studies lies in the inconsistent findings regarding the dimensionality of the INCOM. Classic social comparison theory would suggest that social comparison orientation is a bidimensional construct encompassing the comparison of abilities and of opinions (Festinger, 1954). This theoretical assumption found some support in the original validation studies of the INCOM (Gibbons & Buunk, 1999), with abilities comprising six items and accounting for 34-38% of the total variance and opinions comprising five items and accounting for 10-14% of the total variance. However, the two-factor solution of the INCOM raised discriminant validity concerns given the high correlations found between the ability and opinion factors (Gibbons & Buunk, 1999). This led Gibbons and Buunk to conclude about the plausibility of both a unidimensional and bidimensional factorial solution for the INCOM, while cautioning against using the two subscales separately. So far, most of the studies using INCOM exclusively report the total scale score. Addressing the dimensionality of the INCOM will allow researchers to better understand meaningful relationships with other clinical/psychosocial variables and outcomes. To our knowledge, the INCOM has never been used with the population of parents of children with chronic health conditions. The availability of measures with adequate psychometric qualities to assess social comparison orientation differences among parents of children with chronic health conditions may give an important contribution to this promising area of research.

The Current Study

The current study sought to examine the psychometric proprieties of the Portuguese version of the INCOM in two samples of parents of children with chronic health conditions, such as asthma, diabetes, epilepsy and obesity. More specifically, we aimed to examine 1) the factorial validity of the INCOM; 2) the invariance of the INCOM in two samples of parents of children with chronic conditions; 3) the reliability (internal consistency) and concurrent validity of the INCOM via negative correlations with neuroticism and depression and anxiety symp-

Table 1

Sociodemographic and Clinical Characteristics of the Test and Validation Samples

Variable	Test sample					Validation sample
	Epilepsy (<i>n</i> = 61)	Asthma (<i>n</i> = 88)	Diabetes (<i>n</i> = 63)	Obesity (<i>n</i> = 89)	Global (<i>N</i> = 301)	Epilepsy (<i>N</i> = 192)
Parent sex, <i>n</i> (% of mothers)	53 (86.9)	75 (85.2)	55 (87.3)	82 (92.1)	265 (88.0)	163 (84.4)
Parent age ^a , <i>M</i> (<i>SD</i>)	40.27 (6.1)	39.93 (7.3)	41.02 (6.4)	39.27 (6.2)	40.03 (6.6)	41.7 (5.7)
Parent marital status, <i>n</i> (%)						
Married / Living together	50 (82.0)	70 (79.5)	49 (77.8)	69 (77.5)	238 (79.1)	161 (83.9)
Separated / Divorced / Wid.	11 (18.0)	18 (20.5)	14 (22.2)	20 (22.5)	63 (20.9)	31 (16.1)
Parent education ^a , <i>n</i> (%)						
≤ 6	15 (24.6)	21 (23.9)	9 (14.3)	22 (24.7)	16 (22.3)	43 (21.4)
7-12	25 (57.4)	52 (59.1)	37 (58.8)	56 (62.9)	161 (53.5)	103 (53.6)
> 12	11 (18.1)	15 (17.1)	17 (27.0)	11 (12.4)	45 (14.9)	46 (24.4)
Socioeconomic status, <i>n</i> (%)						
Low	38 (62.3)	69 (78.4)	36 (56.1)	76 (85.4)	219 (72.8)	105 (54.7)
Med./ High	23 (37.7)	19 (21.6)	27 (42.9)	13 (14.6)	82 (27.2)	87 (45.3)
Child sex, <i>n</i> (% of female)	28 (45.9)	32 (36.4)	28 (44.4)	36 (40.4)	124 (41.2)	92 (47.4)
Child age ^a , <i>M</i> (<i>SD</i>)	11.25 (4.2)	11.68 (3.5)	11.40 (4.2)	10.42 (2.4)	11.16 (3.6)	12.2 (3.2)
Time ^a since child's diagnosis, <i>M</i> (<i>SD</i>)	4.36 (3.6)	6.89 (3.9)	4.21 (3.0)	3.03 (2.4)	4.67 (3.6)	4.46 (3.6)

^aIn years.

toms. Based on previous conceptual understanding and empirical research, the analysis of the factorial structure of the Portuguese version of the INCOM was made within a confirmatory factor analysis (CFA) framework. Two alternative models, unidimensional and bidimensional, were tested. Additionally, we aimed at comparing parents' social comparison orientation levels across pediatric chronic conditions. Given the exploratory nature of this research goal, no specific predictions were made regarding these differences.

Method

Participants

In the current study, two samples of parents of children with chronic health conditions were used. Sample 1 (test sample) was composed of 301 parents of children with asthma (29.2%), diabetes (20.9%), epilepsy (20.3%), and obesity (29.6%). Participants in Sample 2 (validation sample) were 192 parents of children with chronic epilepsy. There were no significant differences between the two samples in terms of the participants' main socio-demographic characteristics (age and sex of the children and parents) or their clinical data (time since diagnosis). In both samples, the majority of the parents were mothers, which were married or living together with a partner, and who had a low socioeconomic status (SES), which is representative of the population that receives medical care in Portuguese public health institutions. However, Sample 2 (epilepsy specific) had a relatively larger proportion of families with a middle/high socioeconomic background, $\chi^2(1) = 16.99, p < .001$. Table 1 shows more detailed sociodemographic information for each of the samples.

Procedure

Following the recommendations of [Hambleton and colleagues \(2004\)](#) regarding transcultural adaptation of psychological measures, the INCOM items were independently translated to Portuguese by two independent researchers who were native Portuguese speakers and who were also fluent in English, with both translations being compared to detect discrepancies. Afterwards, a native English speaker, who was also fluent in Portuguese and unaware of the original version of the instrument, performed the back translation of the Portuguese version to English. Next, the original and the back-translated versions were compared. To ensure semantic and content equivalence between both versions, some wordings of the items were slightly altered, after considering the specificities of the Portuguese culture and language. The next step consisted of presenting this preliminary Portuguese version of the INCOM to a pilot group of 8 family caregivers (seven mothers, one father) of children with chronic conditions (epilepsy, $n = 3$; diabetes, $n = 2$; asthma, renal condition, cardiac condition, $n = 1$ each). Parents were questioned regarding the clarity and comprehensibility of the items. This procedure resulted in minor changes to the wording, thus enabling agreement to be reached upon a final version to be administered in the Portuguese context.

The criteria for inclusion in the present study were as follows: (1) parent of a child of 19 years of age or younger with a diagnosis of asthma, epilepsy, obesity, or diabetes for at least six months; (2) absence of major developmental delays in the child; and (3) parent referred to as the primary care provider for health-related issues. Participants were recruited consecutively at the pediatric outpatient services of four Portuguese public hospitals. Formal authorizations were obtained from the hospitals' Boards of Directors. Potential participants were invited to take part while waiting for their child's scheduled medical appointment, provided they met the inclusion criteria. Between January 2012 and February 2013 sample collection included parents of children with one of the four chronic conditions considered (Sample 1), and from March 2013 to September 2014 it was limited to parents of children with epilepsy (Sample 2). These two samples were collected as part of a larger project aimed at examining the adaptation processes and outcomes of family members within the context of pediatric epilepsy. A researcher explained the study's aims and procedures to the families. Parents were informed that their participation was voluntary, and in no way would affect the hospital care and/or level of support services their child received. Informed consent was obtained from those who agreed to participate. Parents completed self-reported measures in a room designated for research purposes. Clinical information was self-reported by the parents and, if necessary, further checked in the medical files.

Measures

The social comparison orientation was assessed using the Portuguese version of the INCOM ([Gibbons & Buunk, 1999](#)). The INCOM comprises 11 items in which the participants state to what extent they agree with statements concerning social comparison habits, ranging from 1 (*I disagree strongly*) to 5 (*I agree strongly*). [Table 2](#) shows all the items. The two reversed items, items 6 and 10, were recoded before running the analyses. The higher the total score, the more the person compares him or herself with others and the more he is affected by social comparisons ([Gibbons & Buunk, 1999](#)).

Neuroticism was assessed using the neuroticism subscale of the Portuguese version of the Eysenck Personality Questionnaire (EPQ; [Eysenck & Eysenck, 1975](#); Portuguese version: [Castro-Fonseca, Eysenck, & Simões, 1991](#)). This consists of 18 items (e.g., "Are you a worrier?") with a dichotomous type of response (*yes* or *no*).

Table 2

Descriptive Statistics of the Items of the INCOM

Nr.	Item	<i>M</i>	<i>Mdn</i>	<i>Mo</i>	<i>SD</i>	<i>Sk</i>	<i>Ku</i>	Min-Max
1	I often compare myself with others with respect to what I have accomplished in life.	2.55	2	2	1.08	0.23	-0.97	1-5
2	If I want to learn more about something, I try to find out what others think about it.	2.82	3	2	1.10	0.08	-1.18	1-5
3	I always pay a lot of attention to how I do things compared with how others do things.	2.92	3	2	1.09	0.13	-0.98	1-5
4	I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing.	3.00	3	4	1.10	-0.07	-0.98	1-5
5	I always like to know what others in a similar situation would do.	3.13	3	4	0.97	-0.29	-0.76	1-5
6	I am not the type of person who compares often with others. ^a	2.36	2	2	1.05	0.73	-0.11	1-5
7	If I want to find out how well I have done something, I compare what I have done with how others have done.	2.62	2	2	0.99	0.29	-0.71	1-5
8	I often try to find out what others think who face similar problems as I face.	3.34	4	4	0.95	-0.58	-0.44	1-5
9	I often like to talk with others about mutual opinions and experiences.	3.95	4	4	0.73	-1.50	4.20	1-5
10	I never consider my situation in life relative to that of other people.^a	2.77	3	2	1.09	0.22	-0.80	1-5
11	I often compare how I am doing socially (e.g., social skills, popularity) with other people.	2.41	2	2	1.03	0.47	-0.57	1-5

Note. Ability items: 1, 3, 4, 6, 7 and 11 (normal typeface); Opinion items: 2, 5, 8, 9, 10 (bold typeface).

^aReverse coded item

Individuals high in neuroticism tend to be moody and worried and to experience guilt, loneliness, and sadness. In the present sample, the Cronbach's alpha coefficient value was .86.

Symptoms of depression and anxiety were evaluated using the Portuguese version of the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983, Portuguese version: Pais-Ribeiro, Silva, Ferreira, Martins, Meneses, & Baltar, 2007), consisting of two subscales: Anxiety ($n = 7$ items; e.g., "I am restless and can't keep still") and Depression ($n = 7$ items; e.g., "I feel as though I am slowed down"). Each item is answered on a 4-point scale, ranging from 0 (*not at all/only occasionally*) to 3 (*most of the time/a great deal of time*). Higher scores represent higher levels of symptoms. In the present sample, the Cronbach's alpha coefficient values were .83 (Anxiety) and .77 (Depression).

The socioeconomic status (SES) was determined using a classification system for the Portuguese context, based on parents' jobs and educational level (Simões, 1994).

Data Analyses

Data analyses were performed using IBM-SPSS Statistics v.21.0 (SPSS an IBM company, Chicago, IL, USA) and AMOS 21.0. While Sample 1 was used in all the statistical analyses performed, Sample 2 was used for cross-validation purposes only. Missing data that were random and less than 5% of the values were handled by replacement of the individual mean scores for each scale (except for sociodemographic and clinical variables). Absolute skewness and kurtosis values of over three and seven, respectively, were used as reference values for determining substantial non-normality (Marôco, 2014).

In order to analyze the factorial validity of the INCOM, two alternative models – unidimensional and bidimensional – were examined against each other using confirmatory factor analysis (CFA) procedures, with Maximum Likelihood (ML), after assessing normality assumptions (Brown, 2015). The main goodness-of-fit indexes considered to evaluate the overall model fit were: χ^2 statistics, Comparative Fit Index (CFI), and Root Mean Square

Error of Approximation (RMSEA), with its associated 90% Confidence Interval, and the Standardized Root Mean Square Residuals (SRMR; Byrne, 2010). Criteria for good model fit were a non-significant χ^2 ($p > .05$), CFI $\geq .95$, RMSEA $\leq .06$ and SRMR $\leq .08$ and criteria for acceptable fit were CFI $\geq .90$, and RMSEA and SRMR $\leq .10$ (Hu & Bentler, 1999; Marôco, 2014). The fit of the original measurement models was improved (i.e., respecified) following modification indices (MI) greater than 11, $p < .001$, and only when theoretically justifiable (Byrne, 2010). The χ^2 difference test was used to calculate significant improvements over competing models (Brown, 2015). Additionally, in order to compare the relative fit of the competing non-nested models, Akaike Information Criterion (AIC) was used, with smaller values indicative of a better fit. In the examination of the local fit of the model values $\geq .50$ of the standardized factor loading (λ) of each item with its respective factor were regarded as significant (Marôco, 2014). The convergence of items into the proposed factors was evaluated with the factor's average variance extracted (AVE) and composite reliability (CR), as described by Fornell and Larcker (1981). AVE greater than .50 and CR greater than .70 were indicative of an item's convergence (Brown, 2015). Evidence for a factor's discriminant validity was found when the squared Pearson correlation between factors was larger than the AVE for each factor (Fornell & Larcker, 1981). Additionally, Pearson correlation coefficients were calculated between the INCOM and measures of neuroticism, depression, and anxiety symptoms. Regarding reliability, two estimates were considered: Cronbach's alpha coefficient and Composite Reliability (CR), the latter being regarded as a more robust estimate for latent factor models with correlated error terms and unequal factor loadings items (non-tau equivalent; Farrell, 2010; Raykov, 1998). In order to verify the stability of the factor solution elected as most adequate, cross-validation was performed in a second independent sample (Byrne, 2010).

Results

Factorial Validity

The data from both Sample 1 and Sample 2 were first checked for normality (see Table 2). The analysis of skewness and kurtosis' absolute values indicated that none of the items posed a considerable bias to normal distribution that would recommend against using ML for estimation ($-1.50 < |Sk| < 0.73$; $1.18 < |Ku| < 4.20$). Using Sample 1 we began by fitting a two-factor model (Model 1). The initial two-factorial model exhibited a less than ideal fit to the data, $\chi^2(43) = 225.32$, $p < .001$; CFI = .79, RMSEA = .12; SRMR = .09; AIC = 271.317. All factor loadings were statistically significant ($p < .01$), however for items 6 and 10 (the two reversed coded items), standardized factor loadings were under the .50 recommended threshold. The examination of the MI suggested that the errors belonging to items 1 and 11, and to items 8 and 9 might be correlated. Because these pairs of items had similar content and belonged to the same dimension, their measurement errors were allowed to correlate. This type of model respecification is frequently necessary and is justified when there is item content overlap (Byrne, 2010). The respecified Model 1 showed acceptable fit to the data, $\chi^2(41) = 135.87$, $p < .001$; CFI = .89; RMSEA = .088; SRMR = .069, which was significantly better than the original model, $\Delta\chi^2(2) = 89.45$, $p < .001$; AIC = 105.87. However, problems of local fit persisted (e.g., low standardized factorial weights of items 6, 9 and 10). At the same time, the two-factor solution suggested discriminant validity issues. More precisely, the correlation between the latent factors was above .80 ($r_{ab,op} = .88$; Brown, 2015) and the Average Variance Extracted (AVE) of each factor was lower than the square of correlation between factors ($AVE_{ability} = .35$; $AVE_{opinion} = .23$; $r^2_{ability, opinion} = .77$; Fornell & Larcker, 1981).

Next, we tested the unidimensional model of the INCOM (Model 2). Goodness-of-fit indices showed poor fit indicators, $\chi^2(44) = 267.38$, $p < .001$; CFI = .74; RMSEA = .13; SRMR = .09; AIC = 311.05. All the standardized factor loadings were significant, however, items 6, 9, and 10 had standardized factorial weights below the recommended threshold. Following examination of MI, errors belonging to items 1 and 11, 8 and 9, and 6 and 10 were correlated since, they belonged to the same theoretical factor and have similar content. The respecified Model 2 showed a good fit, $\chi^2(40) = 103.33$, $p < .05$; CFI = .93; RMSEA = .07; SRMR = .06; AIC = 153.334, which was significantly better than the original model, $\Delta\chi^2(2) = 89.45$, $p < .001$. However, problems with the low factor loadings of items 6, 9, and 10 persisted.

In third place, we tested the possibility of developing a better fitting unidimensional model, by deleting problematic items. The two reverse-coded items (6 and 10) were prime candidates for deletion, given that the covariation between their error terms most likely reflects not the influence of a distinct latent dimension, but an artifact of response styles associated with the negative wording of the items (Brown, 2015). We decided to retain item 9 because its deletion caused a substantive drop in the goodness-of-fit indices, $\Delta\chi^2(6) = 5.376$, $p > .05$. We performed a CFA of the unidimensional model, after taking out items 6 and 10 (model 3). The initial 9 items one-factor model showed poor fit indicators, $\chi^2(27) = 200.12$, $p < .001$; CFI = .78; RMSEA = .15; SRMR = .09 and AIC = 236.18. After correlating pairs of error terms (1 and 11; 8 and 9), goodness-of-fit indices of the respecified model indicated an acceptable fit to the data, $\chi^2(25) = 68.199$, $p < .001$; CFI = .94; RMSEA[HI90%] = .076[.098]; SRMR = .055; AIC = 108.199. The factor loadings for these items ranged from .49 to .72, except for item 9. The CR value calculated from the factor loadings was .804, and the Cronbach's alpha was .81. Comparing both solutions (Model 2 respecified and Model 3 respecified), the latter proved to have a significantly better fit to the data, $\Delta\chi^2(15) = 35.331$, $p < .05$, and lower AIC. These results were replicated in a second validation sample.

INCOM Invariance Across Samples

Statistic stability of the best fitting model (respecified Model 3) was further assessed by a multigroup analysis, comparing the estimates in the test sample ($n = 301$) with those obtained in another independent validation sample ($n = 192$). Chi-square differences between the models with equally constrained estimates and free estimates revealed no statistically significant differences in either the measurement weights, $\Delta\chi^2(8) = 9.366$, $p = .312$, or the structural covariances, $\Delta\chi^2(9) = 9.868$, $p = .361$.

Relationships Between INCOM and Other Constructs

INCOM total scores ($M = 2.98$, $DP = 0.64$) presented weak to moderate positive correlations with the scales of neuroticism ($r = .22$, $p < .001$), depression ($r = .12$, $p = .046$), and anxiety ($r = .19$, $p = .001$), which are in line with previous evidence and as theoretically expected. These correlations support the concurrent validity of the INCOM.

Social Comparison Orientation Among Parents of Children With Chronic Health Conditions: Mean Comparisons

Prior to examining differences in social comparison orientation between parents of children with asthma, diabetes, epilepsy and obesity, these four groups were compared at the level of their major socio-demographic and clinical characteristics using Chi-square tests and ANOVAs. No significant differences were found, except for

SES, $\chi^2(3) = 19.71$, $p < .001$, and length of time since diagnosis, $F(3, 292) = 9.41$, $p < .001$. Families with a child with obesity showed a higher proportion of low SES (85.4%; $n = 76$), comparatively to families with a child with asthma (78.4%; $n = 69$), epilepsy (62.3%; $n = 38$) and diabetes (56.1%; $n = 36$). Children with asthma had been diagnosed for a significantly longer period of time ($M = 6.89$; $DP = 3.81$), in comparison with obesity ($M = 3.03$; $DP = 2.41$), diabetes ($M = 4.21$; $DP = 3.03$) and epilepsy ($M = 4.36$; $DP = 3.61$). Next, we performed an ANCOVA, controlling for SES and time since diagnosis, with social comparison orientation as the dependent variable and health condition as the independent variable. No significant multivariate effect for health condition group was found, $F(3, 290) = .24$, $p = .868$.

Discussion

Parents very much need and want information about their child's chronic conditions. However, the examination of social comparison processes, namely the role played by parents' social comparison orientation differences in the context of these families remains unexplored. This study examined the psychometric properties of the Portuguese version of the INCOM in parents of children with chronic conditions. Particular emphasis was placed on the examination of the factorial structure of the INCOM.

Contrary to previous studies, where a straightforward two-factor solution was found (e.g., Gibbons & Buunk, 1999; Schneider & Schupp, 2014), the results from our sample of parents of children with chronic conditions suggested an overlap between the previous "abilities" and "opinions" factors. Grounded on theoretical and empirical evidence, the examination of the discriminant validity between these two factors challenged the acceptability of the two-factor solution. The CFA studies supported the adoption of a single-factor solution, with exclusion of the two reverse-coded items. The negative formulation of the two reversed items might have hindered understanding, thus preventing the use of the possible range of response values. These results were replicated in a second validation sample. The difficulties in the global fit of a two-factor structure of the INCOM were also reported in cross-cultural adaptation studies conducted in Spain and Germany (Buunk et al., 2005; Schneider & Schupp, 2014). It is possible that the inconsistencies in the results related to the INCOM dimensionality, may be related to specific characteristics of the samples, such as mean age. In fact, studies in support of the original two-factor structure of the INCOM (Gibbons & Buunk, 1999) were all conducted in populations of older adolescents and college students, with the exception of Schneider and Schupp's research. The argument that people in different age groups may posit themselves differently when faced with the precise wording of the INCOM items is in line with past research showing that older people tend to compare their abilities and opinions with others less often than younger people do (Callan, Kim, & Matthews, 2015; Schneider & Schupp, 2014). In future research, it might be important to clarify the motives behind social comparison activity, at various developmental stages, and their correlates in terms of social comparison activity.

In terms of reliability, our results provide support for the INCOM as a reliable measure to use with this population of parents. Regarding concurrent validity, our results showed that parents with higher social comparison orientation presented more anxiety and depressive symptoms, and higher neuroticism scores. The direction and strength of the correlations were as expected and consistent with previous research (e.g., Buunk et al., 2005; Gibbons & Buunk, 1999; Schneider & Schupp, 2014; White et al., 2006). Our results suggest that higher social comparison orientation may be considered a risk factor for poorer parental psychological adjustment (Bennenbroek et al., 2002; Hodges & Dibb, 2010). This constitutes an important contribution of the study given

that identifying targets in greatest need for limited intervention resources and guaranteeing more individualized care constitute major goals for psychology research. This link should be further examined in future research in this field of research.

In our study, no differences were found in social comparison orientation between parents of children with different chronic conditions. This result is in line with a noncategorical perspective of the impact of pediatric illness on family members (Stein et al., 1993). According to this perspective, variability in the psychosocial impact of chronic health conditions on children and their families may be more related to individual and contextual variables of the children and their families, and the way these variables interact with generic dimensions of diseases (e.g., severity, course), rather than to the medical diagnosis of the child, per se (Stein et al., 1993). Future studies should address generic characteristics of the chronic health conditions (e.g., condition severity), as well as possible interactions of these characteristics with parents' social comparison orientation.

The findings of this study should be interpreted in the context of some limitations. Although in accordance with the relative prevalence of each of these conditions, the convenience sampling method used in the data collection was restricted to four pediatric chronic conditions, which may have prevented representativeness of all families, potentially limiting external validity, namely to other chronic conditions. Secondly, sample restrictions precluded examination of the invariance of the INCOM across child's chronic condition and caregiver's sex. Also, it is important to recognize, to some extent, that parents might have responded differently to the items of the INCOM, in case those addressed comparisons directly involving their child.

Future research should address these shortcomings and a more diverse population of parents of children with chronic health conditions should be considered.

In conclusion, the results from the Portuguese cross-cultural adaptation of the INCOM with two samples of parents of children with chronic conditions supported the factorial validity, reliability, and concurrent validity of the measure, comprising 9 items, measuring a unidimensional construct. The briefness and generic stance of the INCOM makes it particularly useful for both clinical and research purposes. These results open an important door in the field of pediatric chronic conditions research, enabling the consideration of parents' social comparison orientation differences in future research, and suggesting possible links with parents' psychological adjustment outcomes. Parents, especially those with higher social comparison orientation, may need assistance in order to use social comparison information more constructively. In the development of materials (informative leaflets, videos, internet sites) or in the design of practical interventions (e.g., awareness campaigns, self-help groups), health professionals face the challenge of optimizing comparative processes in order to promote adjustment of family caregivers.

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Competing Interests

The authors have declared that no competing interests exist.

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