

Assessing indirect aggression in aggressors and targets: Spanish adaptation of the Indirect Aggression Scales

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In recent years, there has been increasing interest in indirect aggression as the most common aggressive behaviour in adulthood. Despite this interest, there are not a great many instruments for measuring this behaviour in adults. The aim of our study was to develop the Spanish adaptation of one of the few instruments that does exist: the Indirect Aggression Scale, in its aggressor and target versions. The analysis of these scales in a sample of 935 university students showed that the aggressor and target versions of the scales had good reliabilities, but that a one-factor structure seemed more feasible than the three-factor structure initially proposed. Taking this one-dimensionality, we developed short versions of the scales, which also showed good reliabilities. The aggressor version presented good convergent validity with direct aggression and impulsivity measures. Finally, none of the scales showed differences associated with sex.

Evaluando la agresividad indirecta en agresores y víctimas: adaptación española de las Escalas de Agresividad Indirecta. En los últimos años se ha producido un creciente interés en la agresividad indirecta debido a que es la forma de agresividad más frecuente en la edad adulta. A pesar de ello no existe un gran número de instrumentos de medida para adultos de la misma. El principal objetivo del presente estudio es desarrollar una adaptación en español de uno de los pocos instrumentos disponibles: las Escalas de Agresividad Indirecta en sus versiones de agresor y víctima. El análisis de dichas escalas en una muestra de 935 estudiantes universitarios mostró que ambas formas presentan una buena fiabilidad pero que en ambos casos la estructura factorial de las mismas es unidimensional, en lugar de la estructura de tres factores propuesta por los autores. Teniendo esto en cuenta se plantea la posibilidad de desarrollar una escala reducida de un menor número de ítems. La versión para agresores presentó una buena validez convergente con otras medidas de agresividad y de impulsividad. Finalmente, no se observaron diferencias asociadas al sexo en ninguna de las escalas.

Traditionally the study of aggressive behaviour has focused on direct aggression. However, in recent years, there has been increasing interest in other kinds of aggressive behaviour that are not usually directly manifested against the attacked person. These forms of aggression involve a sort of social manipulation in which the aggressor acts on the people around the attacked person with the sole aim of harming him without having to face him directly (Bjorkqvist, Osterman, & Kaukiainen, 1992). This kind of aggression — also known as indirect, social or relational aggression (depending on slight nuances)— appears during the socialization process of individuals, so that the physical or verbal aggression types typical in children and adolescents turn into other kinds of aggression in adults (Vaillancourt, 2005). So, while physical aggression reaches a peak at around 30 months of age, after which it shows a progressive decrease, indirect aggression begins

during childhood and progressively increases until it peaks during adolescence and adulthood (Bjorkqvist et al., 1992; Tremblay, 2005; Cangas, Gázquez, Pérez-Fuentes, Padilla, & Miras, 2007).

Although indirect, relational and social aggressions have many common elements, certain nuances differentiate one from the other. In indirect aggression the aggressor remains hidden and tries to harm the other either in an undercover manner by, for example, gossiping, spreading rumours or inciting the members of the group to exclude him/her, or physically, by wrecking or stealing his/her property. Relational aggression is characterized by acts that harm the individual's social relations, circle of friends, etc. Finally, social aggression aims to harm the self-esteem and social status of the person attacked (Archer, 2001; Coyne, Archer, & Eslea, 2006). Despite these differences, they tend to be grouped under the term indirect aggression, so this is the term that we shall use here bearing in mind that it refers to the three types described above.

The initial research carried out on this type of aggression considered it to be typically «feminine» and that men showed a greater tendency to commit physical aggression. Numerous studies have demonstrated that men show higher levels of physical aggression than women (see, for example, Archer's meta-analysis, 2004), differences that are present from childhood to elderly (Morales-Vives & Vigil-Colet in press), and this has been shown to

be due to true differences and not to measurement instrument bias (Condon, Morales-Vives, Ferrando, & Vigil-Colet, 2006). Although a variety of studies have demonstrated higher levels of indirect aggression in women, others have found no significant differences, especially in adults (Archer, 2004). So although there is sufficient evidence to suggest that in childhood girls have higher levels of indirect aggression than boys, it seems that in adulthood both sexes use this type of aggression equally. All this seems to imply that the differences in indirect aggression that have been attributed to sex seem to reflect the different rates at which boys and girls socialize, and that in adulthood levels of indirect aggression are the same (Lagerspetz & Björkqvist, 1994).

One of the main factors that explains the spate of interest in this type of aggression is that it occurs frequently, particularly in comparison to physical aggression. In this regard, it seems that this type of aggressive behaviour receives less social reprobation than the direct type which prompts adults to channel their aggressiveness by this means. In fact, authors such as Björkqvist (1994) are of the opinion that this type of aggression predominates in adulthood. Furthermore, indirect aggression seems to play a key role in processes of great social repercussion like bullying or mobbing (Björkqvist, Österman, & Hjelt-Bäck, 1994; Björkqvist, Österman, & Lagerspetz, 1994; Coyne, Archer, & Eslea, 2006; Garandau & Cillessen, 2006).

Although a great deal of research points to the importance of this type of aggression, problems of assessment and measurement limit the number of instruments available for this purpose. In particular, these problems are due to the fact that the subtlety of such behaviours makes them far more difficult to assess than the direct type of aggression. Also, as Forrest, Eatough, & Shevlin (2005) point out, although there are some instruments for assessing indirect aggression in children and adolescents very few have been designed for adults (with the exception of the scales specific for the work place), which makes it more difficult to comprehend and assess this type of aggression in adults. And while a series of consistent predictors have been established for direct aggression —such as impulsivity or deficits in social problem solving— hardly any studies have been made about the predictor variables of indirect aggression.

Many of the instruments for assessing indirect aggression are not specific tests; rather they are subscales of general aggression tests that do not analyse its component elements. This is the case, for example of one of the first questionnaires developed in this field: the direct/indirect aggression scale by Björkqvist, Österman, & Lagerspetz (1992), one of the few questionnaires that has been adapted to Spanish (Toldos, 2005). Other authors have taken this scale as a starting point and have tried to develop scales that assess indirect aggression, relational aggression and social aggression. This is the case of the indirect/social/relational aggression scale by Coyne et al., (2006). Nevertheless, most of these scales have been developed to analyse this type of aggression framework in children and adolescents, and the structure of indirect aggression in adults has only been studied in the workplace (Richardson & Green, 1999).

In this context, we felt that the Indirect Aggression Scales (IAS) specifically developed for adults by Forrest et al., (2005) were particularly promising. These scales introduced two new aspects that should be emphasised. First, the scales had two versions (aggressor and target), which provide a measurement of an individual's tendency to practise this type of aggression or suffer it. Second, they were developed only with items of indirect aggression, unlike other scales that mixed items of both direct and indirect aggression.

When Forrest et al., analysed the factorial structure, they found a three-factor structure for both versions, comprising items of social exclusion, guilt induction and malicious humour. Nevertheless, we consider that there are some methodological limitations that may question the dimensionality of these scales. Firstly, to determine the number of retained factors they used the Kaiser rule (1970), which tends to overestimate the number of factors. Furthermore, the extraction was carried out using a Pearson correlation matrix when polychoric correlation matrixes are more advisable when factorizing items in a Likert response format. Secondly, they applied an orthogonal rotation procedure although it is difficult to assume that the different forms of indirect aggression are independent. In this regard, their loadings matrix reveals that many items showed high loadings on two or more factors.

Taking these limitations into account, the present study aims, first, to make a Spanish adaptation of the indirect aggression scales for target (IAS-t) and aggressor (IAS-a) and determine their dimensionality and factorial structure. Secondly, we aim to analyze the relations between indirect aggression, direct aggression, and impulsivity, because of the well-established relationship between impulsivity and aggressive behaviour and within both forms of aggression (Card, Stucky, Sawalani, & Little, 2008; Vigil-Colet, Morales-Vives, & Tous, 2008). The analysis of the relationships between indirect aggression scales, and aggression scales and impulsivity will be used as an indicator of the convergent and divergent validity of IAS because it is assumed that direct aggression and impulsivity will be related with the aggressor form of IAS but not with the target form.

Finally, we aim to use IAS scores to verify the hypothesis stated above that in adulthood there are no differences in indirect aggression due to sex.

Method

Participants

The participants were 935 university students (434 men and 501 women) aged between 17 and 50 years old (mean= 23.47; standard deviation= 6.74), belonging to different faculties of the Rovira and Virgili University, Tarragona (Spain)

Instruments

Indirect Aggression Scales: The scales proposed by Forrester et al., 2005 were adapted to Spanish using the back-translation procedure described by Hambleton (2005). Two members of the Language Service of the Rovira i Virgili University, with previous experience in adapting psychological tests, made the translations. First, a native Spanish speaker translated the original tests from English to Spanish, and then a native English speaker translated this text back into English. Finally, the back translated version and the original version were compared, and no lack of equivalence was found. Table 1 shows the resulting items of the Spanish version of IAS-a and IAS-t.

Dickman's Impulsivity Inventory (IID). We used the Spanish adaptation of this inventory (Chico, Tous, Lorenzo-Seva, & Vigil-Colet, 2003). It consists of two scales: functional impulsivity (IF) and dysfunctional impulsivity (DF) with reliabilities of 0.78 and 0.76, respectively. Its factorial structure is equivalent to the original English version.

Table 1
ITEMS of the IAS-a and IAS-t scales, item loadings, descriptive statistics, and item-total scale correlations (r_{it})

Test	Item	Loading	Mean	s.d.	r_{it}
IAS-a	He utilizado mi relación con otros para intentar que cambien una decisión	.45	2.14	0.95	.34
	He utilizado el sarcasmo para insultarlos	.50	2.19	1.03	.50
	He intentado influenciarlos para que se sintieran culpables	.60	1.74	0.89	.50
	Les he ocultado información que el resto del grupo sabía	.47	1.85	0.87	.37
	Les he excluido de actividades adrede	.71	1.37	0.64	.52
	He hecho que los demás no les hablaran	.81	1.08	0.33	.41
	Les he excluido de un grupo	.73	1.13	0.39	.42
	Me he aprovechado de sus sentimientos para coaccionarles	.68	1.26	0.58	.42
	He hecho comentarios despectivos sobre su aspecto	.54	1.74	0.84	.48
	He utilizado bromas privadas para excluirles	.71	1.31	0.63	.49
	Les he hecho chantaje emocional	.58	1.50	0.76	.45
	Les he imitado delante de otras personas	.54	1.81	0.92	.45
	He hecho correr rumores sobre ellos	.62	1.22	0.55	.33
	Les he hecho una broma pesada	.57	1.44	0.72	.36
	He hecho algo para que parecieran estúpidos	.75	1.27	0.56	.57
	He simulado estar dolido / enfadado con ellos para que se sintieran mal	.55	1.56	0.73	.39
	Les he hecho sentir que no encajaban	.77	1.24	0.53	.52
	He hecho que pasaran vergüenza delante de otros	.63	1.27	0.56	.47
	He dejado de hablarles	.49	1.67	0.86	.35
	Les he sometido a presiones innecesarias	.66	1.28	0.58	.39
	Les he excluido de conversaciones adrede	.71	1.27	0.57	.54
	Me he burlado de ellos en público	.67	1.31	0.62	.51
Les he insultado	.57	1.56	0.78	.45	
Les he criticado en público	.59	1.71	0.83	.55	
He puesto otras personas en su contra	.77	1.22	0.55	.53	
IAS-t	Han hecho que los demás no me hablen	.55	1.43	0.72	.39
	Me han ocultado información que el resto del grupo sabía	.57	1.84	0.86	.46
	Me han hecho pasar vergüenza delante de otros	.60	1.65	0.79	.52
	Me han excluido de un grupo	.61	1.30	0.63	.44
	Me han insultado	.66	1.49	0.77	.52
	Han dejado de hablarme	.68	1.42	0.68	.51
	Han utilizado su relación conmigo para intentar que cambie una decisión	.58	1.63	0.84	.48
	Se han aprovechado de mis sentimientos para coaccionarme	.73	1.47	0.76	.55
	Se han burlado de mí en público	.72	1.31	0.61	.54
	Han simulado estar dolidos y/o enfadados conmigo para que me sintiera mal	.71	1.50	0.77	.59
	Han puesto a otras personas en mi contra.	.74	1.49	0.75	.63
	Me han hecho sentir que no encajaba	.58	1.51	0.75	.48
	Han hecho correr rumores sobre mí	.65	1.55	0.77	.49
	Me han hecho chantaje emocional	.66	1.52	0.76	.53
	Me han criticado en público	.73	1.41	0.67	.56
	Han utilizado bromas privadas para excluirme	.70	1.24	0.57	.47
	Me han sometido a presiones innecesarias	.58	1.60	0.82	.32
	Han utilizado el sarcasmo para insultarme	.66	1.34	0.65	.43
	Me han hecho una broma pesada	.56	1.56	0.82	.34
	Han hecho comentarios despectivos sobre mi aspecto	.63	1.34	0.67	.39
	Me han excluido de conversaciones adrede	.69	1.27	0.55	.54
	Me han imitado delante de otras personas	.57	1.37	0.66	.41
Me han excluido de actividades adrede	.71	1.25	0.53	.54	
Han hecho algo para que pareciera estúpido	.67	1.25	0.56	.48	
Me han intentado influenciar para que me sintiera culpable	.72	1.46	0.70	.59	

Buss and Perry Aggressiveness Questionnaire: We used the reduced Spanish version of the questionnaire (Vigil-Colet, Lorenzo-Seva, Codorniu-Raga, & Morales, 2005), consisting of four scales; physical aggression (PA), verbal aggression (VA) anger (AN) and hostility (HO) with reliabilities of 0.92, 0.75, 0.79 and 0.75, respectively. This adaptation presents a good fit to the four-factor model proposed initially by Buss and Perry (1992) and is free of sex bias (Morales-Vives, Codorniu-Raga, & Vigil-Colet, 2005; Condon et al., 2006).

We analysed the data using SPSS 17.0 and FACTOR (Lorenzo-Seva & Ferrando, 2006). We used FACTOR in addition to SPSS for Exploratory Factor Analysis (EFA) because it enabled us to use polychoric correlation matrices and make complementary analyses such as parallel analysis (Horn, 1965).

Procedure

Two professional psychologists administered the tests to groups of between 15-30 individuals in their classrooms. Each individual was randomly assigned one of the scales to answer: IAS-a or IAS-t. In addition, 220 individuals answered the AQ questionnaire and DII. There were two main reasons for applying only one of the IAS forms to individuals. The first was that, in an applied setting, psychologists will probably be interested in one of the two forms of IAS to assess a possible aggressor or a victim of indirect aggression, so it is advisable to analyze the psychometric properties of IAS in the same situation, when only one form is administered. The second reason was that IAS-a and IAS-t are made up of almost the same items, varying only if the individual is the aggressor or the target. In this situation the administration of both forms may introduce carry-over effects, which may disturb subsequent statistical analysis.

Data analysis

Data analysis was performed in two steps. In the first one we analyzed the factorial structure of IAS-a and IAS-t. Taking into account the lack of multivariate normality that is usually related to Likert-type items we used specific methods (Unweighted Least Squares as the extraction method and the polychoric correlation matrix). The dimensionality of the inventories was assessed using parallel analysis. In the second step we analyzed the psychometric properties (reliability and convergent validity) of IAS and sex effects on IAS scores.

Results

Before carrying out the EFA, we computed the values of the Kaiser-Meyer-Olkin index, which were .91 and .93 for IAS-a and IAS-t, respectively, indicating that the correlation matrixes were suitable for factor analysis. The multivariate kurtosis coefficients were 994 and 949, and the corresponding significance tests ($Z=79.1$ and 74.6 $p<0.01$) indicated that the multivariate distribution significantly deviated from a normal multivariate distribution. In this situation, a factor analysis method that assumes normal multivariate distribution is not advisable. For this reason we used Unweighted Least Squares (ULS) as the factor extraction method. Furthermore, in this case the Pearson correlation matrix was not appropriate either so we performed EFA on the polychoric correlation matrix (Muthén & Kaplan, 1985; 1992).

The scree tests (Cattell, 1966) shown in Figure 1 suggested that both scales were one-dimensional. The variance accounted for by these factors was 42.34% and 45.21% for IAS-a and IAS-t, respectively. Parallel analysis (Lattin, Carroll, & Green, 2003) was also computed and the dimensionality for both scales proved to be

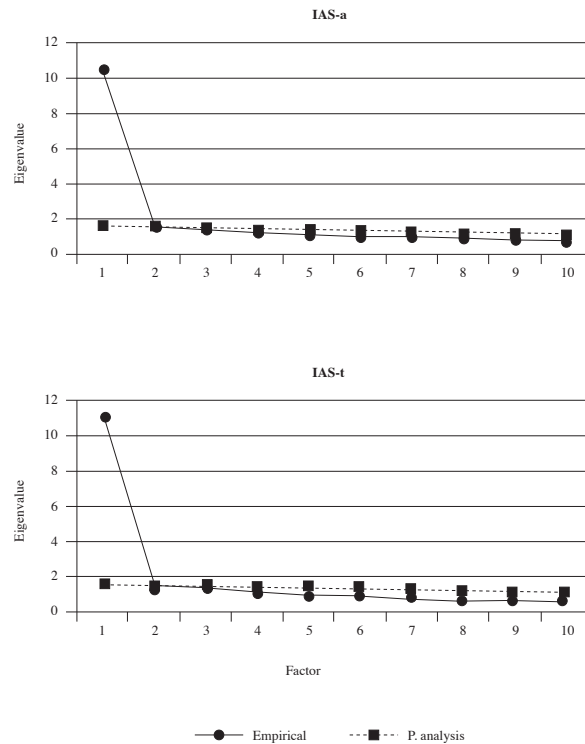


Figure 1. Scree-test and parallel analysis for aggressor and target versions of IAS

the same because the eigenvalue of the second factors were below the values that would be expected by chance.

Table 1 shows descriptive statistics for the items of IAS-a and IAS-t and their factorial loadings. As can be seen, all the loadings are greater than 0.40 and the item-total correlations fall in the .30 - .60 interval so there is no need to remove any items because of low loadings or inappropriate item-total relationship. Nevertheless, taking into account their good psychometric properties, 25 items may be excessive for a one-dimensional questionnaire so we also developed a short version of the scales by selecting the 10 items with highest loadings on IAS-a and IAS-t. Table 2 shows descriptive statistics for the full IAS-a and IAS-t scales and for the short scales for men and women. A group of t-tests showed that none of the sex differences was significant either for the full ($t_{(425)} = 1,333$ $p > 0.05$ and $t_{(450)} = 1,58$ $p > 0.05$ for aggressor and target forms respectively) or the short scales ($t_{(425)} = 1,46$ $p > 0.05$ and $t_{(450)} = 0,13$ $p > 0.05$).

Table 3 shows the reliabilities (Cronbach's alpha) for the full and short scales. As can be seen, all the scales showed high reliabilities and the use of short forms did not lead to any significant decrease, so short forms may be a good alternative to the scales initially proposed.

Table 4 shows the Pearson product-moment correlations between the IAS scales, AQ and DII. The aggressor version of IAS showed significant and moderate relationships with all aggression scales and with dysfunctional impulsivity. As was expected, IAS-t had no relationship with impulsivity and aggression measures with the exception of a slight but significant relationship with the AQ hostility scale.

Table 2
Descriptive statistics of full and short IAS versions for men, women and overall sample

	IAS - a		IAS - as		IAS - t		IAS - ts	
	Mean	S. D.	Mean	S. D.	Mean	S. D.	Mean	S. D.
Men	37.05	10	13.02	3.85	31.11	8.10	13.81	4.66
Women	35.37	7.91	12.33	3.10	32.15	8.24	14.05	4.11
Total	35.89	8.63	12.56	3.34	31,73	8,18	13.97	4.45

Table 3
Reliabilities (a) and 95% confidence interval for full and short versions of IAS-a and IAS-t

IAS-a	.875	.855 - .893
IAS-as	.818	.788 - .845
IAS-t	.898	.885 - .910
IAS-ts	.849	.830 - .867

Table 4
Product moment correlations between indirect aggression, impulsivity and Aggression Questionnaire scales

	Function- nal	Dysfunc- tional	Physical	Verbal	Anger	Hostility	AQ Total
IAS-a	.102	.301	.342	.325	.286	.359	.462
IAS-t	-.080	.048	.122	.048	-.012	.196	.179

p < 0.01; p < 0.05

The results reported above show that the Indirect Aggression Scales provide a reliable measure of indirect aggression in Spanish from both the aggressor and target perspectives. The most prominent difference between our results and the initial proposal made by Forrest et al., (2005) is the dimensionality of the scales. Scree-test and parallel analysis showed that our data has a quite clear one-dimensional structure for both IAS-a and IAS-t. Forrest et al., however, proposed a three-factor structure comprising social exclusion, guilt induction and malicious humour. As we have pointed out above, the methodology they used may have led them to extract too many factors (for example, Kaiser's rule often overestimates the number of retained factors and polychoric correlations are more advisable than Pearson's correlation matrix). The orthogonal loadings matrix of their factorial solution shows that many items have complex loadings, which may indicate that they share a common factor. However, the authors do not provide the correlation matrix between the resulting scales so it is not possible to test this hypothesis. Furthermore, the variance accounted for by their three factors was above 45 per cent, which is the same amount of variance accounted for by our one-dimensional solution.

A possible explanation of the differences between both studies may be that one of the three factors proposed by Forrest et al., accounted for much more variance than the remaining two factors thus giving the scree test the shape of a one-dimensional solution. Nevertheless, this cannot be the case in our study, because the loadings of all items on the factor of indirect aggression are quite similar across the three kinds of items that are supposed to reflect social exclusion, guilt induction and malicious humour. In fact, the ten highest loadings are on a mixture of items.

Another source of evidence that suggests that the scales are one dimensional is that in other indirect aggression scales, such as the Direct and Indirect Aggression Scales (Björkqvist et al., 1992; Toldos, 2005), the Indirect / Social / Relational Aggression Scale (Coyné et al., 2006), or the EXPAGG scale (Tapper & Boulton, 2000) the structure of indirect aggression items was also one-dimensional. Taking all this into account, it seems that indirect aggression items reflect the variability of one latent variable related to indirect aggression and not three independent (orthogonal) latent variables. Nevertheless, further studies in new samples are needed to verify this.

As other studies have shown (for a revision see Archer, 2004), it seems that there are no sex differences in indirect aggression in adulthood, at least at the age range of this study. Nevertheless, future studies with elderly and non university samples will have to generalise this lack of difference because of the specificity of the sample used here. On the other hand, and alternative explanation to this lack of differences is that sex bias in the IAS may be hiding true sex differences so, future research would have to assess the absence or presence of this effect.

The relationships between IAS scales, AQ and DII give the first evidence of IAS validity. Various studies have shown that direct and indirect aggression are related: that is, aggressive individuals seem to present both kinds of aggression (Toldos, 2005; Card et al., 2008). Therefore, a measure of indirect aggression such as IAS-a should be related to a measure of direct aggression such as AQ, which is the kind of relationship found in our study. What is not clear is which determinants make aggressive individuals use direct or indirect aggression. In this regard, situational factors may be

key to understanding why individuals use one form of aggression or another and further research using such methods as three-way component analysis (which take into account situational aspects in psychometric measures) may be helpful (Lorenzo-Seva, Morales-Vives, & Vigil-Colet, 2010).

On the other hand, IAS-t does not show the same pattern of relationships with direct aggression measures, which is what was expected taking into account that it is a measure of suffering aggression not a measure of aggressive behaviour. The only relationship found was with the Hostility scale of AQ which may be explained by the fact that this scale measures a mixture of resentment and mistrust and it seems logical for people who have been suffering aggression to have increased levels of resentment.

IAS-a showed a significant relationship with dysfunctional impulsivity. This is important information because, as Vaillancourt (2005) pointed out, very few studies have examined indirect aggression correlates and there is no previous evidence of

relationships between impulsivity and indirect aggression. Many studies have shown that impulsivity, and more specifically dimensions such as dysfunctional impulsivity, highly associated with inhibition deficits are related to direct aggression (Barrat, 1991, 1994; Vigil-Colet et al., 2008). The existence of a positive relationship between impulsivity and indirect aggression seems to show that impulsivity is not only related to primary forms of aggression such as impulsive aggression but also to more sophisticated and less immediate forms of aggression such as indirect aggression. From this viewpoint, impulsivity seems to be a predictor of all forms of aggression and not just specific forms of aggression.

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