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Adaptation, validity, and reliability of the Interaction with Disabled Persons Scale in Spanish population

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ABSTRACT

Purpose: To adapt the Interaction with Disabled Persons Scale (IDP) into Spanish and examine its factor structure.

Methods: A forward and back translation of the IPD was performed by professional translators of scholarly articles. Spanish-speaking professional translators provided modifications in order to develop the final version of the scale. Participants filled in the Spanish version of the IDP, Positive and Negative Affect Schedule (PANAS), Multidimensional Attitudes Scale toward persons with disabilities (MAS), and Semantic Differential Technique (SDT).

Results: A total of 523 persons (62.6% women), with a mean age of 29.22 ($SD = 14.03$) ranking from 18 to 81. The confirmatory factor analysis showed a reliable brief version of the IDP with adequate psychometric properties and two factors: ($\chi^2_{(19)} = 28.98$, $p < 0.001$, CFI = 0.94, TLI = 0.91, RMSEA (90% IC) = 0.05 (0.01, 0.08), SRMR = 0.06). The first factor solution was Coping/Succumbing Framework and the second factor was Discomfort in Social Interaction. The internal consistency reliability for the first factor was 0.63 and for the second 0.66.

Conclusions: Our findings provide evidence of the psychometric properties of the IDP as a brief measure of attitude toward individual with special needs in Spanish population.

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KEYWORDS

Disability; individual with special needs; intellectual disabilities; persons with disabilities; psychometric properties; validity

► IMPLICATIONS FOR REHABILITATION

- The Interaction with Disabled Persons Scale (IDP) was successfully translated into Spanish language.
- The Spanish version of IDP Scale has a good acceptability, acceptable internal consistency, and high test-retest reliability.
- The Spanish version of IDP can be used to assist the clinicians, educators, and researchers in identifying the attitudes of the Spanish population toward persons with functional diversity in Spanish.
- Identifying the attitudes will permit to improve the inclusion policy and to design social programs toward greater inclusion.

Introduction

Disability is a global, complex, and growing phenomenon of the twenty-first century that can result from a varied range of injuries and diseases affecting an extensive proportion of the population [1]. According to World Health Organization [1], which utilizes the International Classification of Functioning Disability and Health as its conceptual starting point, the term disability can be understood “as a dynamic interaction between health conditions and contextual factors, both environmental and personal” [2]. The World Health Organization (2011) describes disability as an “umbrella term for impairments, activity limitation and participation restrictions, referring to the negative aspects of the interaction between an individual (with a health condition) and contextual factors (personal and environmental factors)” [1]. In this research, disability is described in accordance with the above-mentioned International Classification of Functioning Disability and Health description and with a new approach proposed in Spain by Palacios and Románach [3,4]. The authors proposed a

vision based on human rights and considers the work on the field of bioethics a basic tool to achieve dignity for persons who are discriminated on the basis of their disability. They proposed changing the “disability” by the term “functional diversity.”

The first ever World Report on Disability, produced jointly by the World Health Organization and The World Bank has estimated that more than one billion people, namely 15% of the world population, live with some form of functional diversity, and by 2050, more than 23.8% people may be living with a functional diversity [1].

During the recent years, the social inclusion and accommodation practices of persons with functional diversity in mainstream society have gained growing importance within disability policy [5–8]. It has been seen not only as a right but also as a way of counteracting economic poverty, social exclusion, and lower education achievements of poorer health variables [1]. Despite legislative measures as the Convention on the Rights of Persons with Disabilities, other initiatives are implemented to increase social inclusion and to counteract discrimination and exclusion of

persons with disabilities [9]. In the last few years, several studies has suggested that there are different barriers that stand in the approach of a complete social inclusion, such as discriminating, prejudice, or negative attitudes, inaccessible environments and lack of information [10–12].

Attitudes create the main key barriers to improve opportunities and community inclusion for persons with functional diversity. Negative attitudes and behaviors toward persons with functional diversity as avoidance, dislike, or prejudiced may be assessed by diverse tools. A recent scoping review of instruments exploring attitudes toward persons with functional diversity has identified more than 30 instruments [13]. A total of 10 instruments were identified that measure attitudes toward persons with functional diversity in general such as the Attitude toward Disabled Persons Scale or the Interactions with Disabled Persons Scale [13]. The Interaction with Disabled Persons Scale (IDP) was developed to overcome some problems with the Attitude toward Disabled Person Scale, including date language (e.g., failure to use person first language), and its one-dimensionality in light of arguments regarding the multidimensional nature of attitudes toward persons with functional diversity [14,15]. The IDP reflects a multidimensional theory of attitudes, having been “designed to measure reactions, motivations and emotions that underlie negative attitudes liked with discomfort that some individuals experience in actual or anticipated social interaction with an individual with functional diversity” [14,15]. Since its development, the IDP has been used to measure and compare attitudes amongst numerous groups in previous published articles [16–18]. In this line, prior studies have suggested that several factors including age, gender, and previous experiences of contact with people with functional diversity are linked with the attitudes toward this collective.

Published studies had described gender such as a relevant factor related to attitudes toward persons with functional diversity and their inclusion in society [19–22]. A systematic review analyzed 13 studies addressing peer attitudes and concluded that gender appeared to be associated with attitudes, with females having more positive attitudes than males [19]. Such a benevolent attitude on the part of females may be attributed to their designated role in the society, as they are expected to be more sensitive and protective than males. Concerning age, there are studies evidencing that younger persons who had regular contact or lived with persons with disability have a tendency to have more positive attitudes toward them than the community in general [5,23–26]. They were likely to believe in eugenic explanations for disability, and more likely to support social inclusion. A systematic review of 35 studies found that there was a positive association between individuals who have contact with persons with disabilities and their attitudes toward them [24].

To our concern, with the prevalence rates of disability rising globally, there has been a growing interest in studying attitudes toward persons with functional diversity. In this context, reliable instruments into Spanish culture are necessary to identify community attitudes toward persons with functional diversity, which will allow for the design and implementation of programs to improve social inclusion. The purpose of this study was to adapt the IDP into Spanish and examine its factor structure.

Materials and methods

Ethics statement

The investigation was approved by the Experimentation Ethics Committee of the University (965/CEIH/2019) and all participants signed the corresponding written informed consent.

Design

This is an instrumental design aiming to adapt and validate the IDP Scale according to the standards for the development and review of instrumental studies [27]. The study population was the general population using the “snowball” technique.

Translation procedure

A direct-back translation of the original items was performed according to the guidelines of Beaton et al. [28]. Two professional translators of scholarly articles with extensive mastery of the source language working independently made the translation from English to Spanish. Later, a consensus meeting was held by these translators to discuss the differences between the two versions in order to obtain a unique Spanish version. Back-translations from Spanish to English were performed by two independent professional bilingual translators different from those involved in the forward translation. These translators were blind to the original scale.

The items were qualitatively evaluated through expert judgment [27,29]. The evaluation was conducted by three experts (one expert in the construction of scales and two who were familiar with the construct to be evaluated). The task of the experts was to assess the writing of each item qualitatively, as to whether they were understandable. Based on these assessments, modifications were made to the scale. A modification was made in six items (5, 6, 10, 15, 16, and 19) according to the dynamic and constructive paradigm beyond disability and impairment proposed in Spain by Palacios and Románach [3,4,30], the word “disability” was changed to the term “functional diversity.” A final Spanish version was made and its psychometric properties were assessed (see [Supplementary Appendix I](#)).

Sample and procedure

The participants were sampled via the “snowball” technique: the questionnaires were given to a group of students and research assistants who asked classmates, friends, acquaintances, and family members to complete them. Each participant’s consent was obtained after a short, mostly technical, explanation of the procedure involved. The final sample was composed of 523 people (62.6% women), with a mean age of 29.22 ($SD = 14.03$) ranking from 18 to 81. This sample was split in two random subsamples to perform the exploratory and confirmatory analyses: the first subsample was formed by 269 people (62.8% women), with a mean age of 29.31 ($SD = 14.06$) ranking from 18 to 81; the second subsample was formed by 254 people (61.8% women), with a mean age of 29.11 ($SD = 14.04$) ranking from 18 to 74.

Measures

Interaction with Disabled Persons Scale

The IDP Scale is a versatile and comprehensive instrument used to measure the amount of discomfort that the respondent would feel in interacting with the person with functional diversity on a personal level (14). This scale has been applied in various population such as midwives (17), health professionals from Greece (18), and general population from Urdu (19). The IDP Scale consists of 20 statements grouped into six factors (Discomfort in Social Interaction, Coping/Succumbing Framework, Perceived Level of Information, Vulnerability, Coping, and again Vulnerability), where respondents indicate on a six-point scale from 1 (*Very much agree*) to 6 (*Very much disagree*) how true each statement is of them.

There is no neutral point on the scale. Three of the items are reverse scores (items 10, 14, and 15). Higher scores indicate greater discomfort in social interactions with people with disabilities. According to prior studies, test-retest reliability coefficients ranging from 0.51 to 0.82 were obtained in eight administrations of the instrument, and the internal reliability of the IDP factors ranges from 0.74 to 0.86 [14,15]. Recently, the IDP Scale has been translated and validated into Greek using a sample of health professionals showing excellent internal consistency ($0.87 < \alpha < 0.95$) [18]. However, in Spain, no study has been reported to translate the IDP and to evaluate its psychometric properties among Spanish community.

Positive and Negative Affect Schedule (PANAS)

The version of PANAS validated by Sandín et al. was used. This questionnaire has 20 items, 10 to positive affect (e.g., enthusiastic; $\alpha = 0.87$) and 10 to negative affect (e.g., scared; $\alpha = 0.75$). Participant responded to each item on a five-point Likert-type scale ranging from 0 (*Very slightly or not at all*) to 4 (*Extremely*) [31].

Multidimensional Attitudes Scale toward persons with disabilities (MAS)

The version of MAS validated by Stevens et al. [32] was included. This scale is a 34-item self-reported questionnaire intended to measure explicit attitudes toward people with visible disabilities (i.e., affects, cognitions, and behaviors). It utilizes a social scenario vignette describing an interaction between "José" or "Claudia" and someone in a wheel chair. Respondents are asked to rate their reactions, using a five-point Likert scale ranging from 1 (*Not at all*) to 5 (*Very much*). High scores represent negative affects ($\alpha = 0.83$), cognitions ($\alpha = 0.91$), and behaviors ($\alpha = 0.85$).

Semantic Differential Technique (SDT)

The semantic differential technique was developed by Osgood [31,33] to measure the meaning of attitudes and beliefs about a concept, phenomenon, or object through a set of opposite adjectives that are used to evoke a subject's feeling about, or evaluation of, the concept. We used 18 pairs of adjectives with item responses that may range from 1 to 7, so higher scores suggest

more positive attitudes toward people with disabilities ($\alpha = 0.96$). Semantic differential technique has been used previously to identify attitude toward people with disabilities in Spanish sample [34].

Sociodemographic Questionnaire

Participants were asked to provide sociodemographic information including age, gender, and previous contact with a person with functional diversity.

Analysis

Statistical analyses have been conducted using R software (R Foundation for Statistical Computing, Vienna, Austria) [35]. Particularly, analyses were made by appropriate the psychometric properties and factor structure of the scale, the internal consistency reliability, and the construct validity. Thus, descriptive statistics, Cronbach's alpha, exploratory and confirmatory factor analyses, Pearson's bivariate correlations, and mean difference analyses (Student's *t*-test) were computed.

Results

Psychometric properties and factor structure

We conducted an exploratory factor analysis (EFA) with the first random sub-sample. The Kaiser-Meyer-Olkin test of sampling adequacy was 0.74 and Bartlett's test of sphericity was significant ($\chi^2 = 370.32$, $p < 0.001$) indicating that the data were well-suited for factor analysis, although it is noteworthy that the patterns of correlation were not as compact as expected given KMO's median values. Once proved the adequacy of the data, a parallel analysis was computed [36]; it suggested a number of five factors. Thus, an EFA looking for five factors was computed using maximum-likelihood with Oblimin rotation (following the same method than with the original scale) [14]. The mean, standard deviation, skew, kurtosis, item-total correlation, Cronbach's alpha without the item, communality, and factor loadings in the five factors are presented in Table 1.

The exploratory analysis factorization showed a different pattern of grouping than in the original scale. Furthermore, some

Table 1. Statistical analysis of the items and factor structure of the IDP.

Items	<i>M</i>	<i>SD</i>	Skew	Kurtosis	R IT-c	α without item	h^2	Factor loadings				
								F1	F2	F3	F4	F5
1	1.39	0.96	3.20	10.97	0.62	0.70	0.69	0.82	-0.09	-0.01	-0.09	0.02
2	1.77	1.16	1.85	3.29	0.50	0.71	0.59	0.69	-0.01	0.09	0.15	0.05
3	2.47	1.43	0.76	-0.30	0.34	0.72	0.44	0.59	0.15	-0.13	0.23	-0.14
4	2.99	1.63	0.50	-0.84	0.12	0.74	0.89	-0.01	-0.03	0.02	0.95	0.01
5	2.48	1.58	0.93	-0.25	0.26	0.73	0.28	0.27	0.02	-0.07	0.37	-0.06
6	3.59	1.77	0.07	-1.37	0.33	0.73	0.38	0.15	0.27	0.10	0.12	-0.45
7	2.95	1.91	0.47	-1.31	0.24	0.73	0.99	0.00	-0.01	1.00	0.00	-0.02
8	3.27	1.90	0.27	-1.43	0.07	0.74	0.07	0.00	-0.03	0.22	0.11	-0.05
9	4.61	1.52	-0.90	-0.33	0.55	0.71	0.41	-0.12	0.57	-0.03	-0.03	-0.13
10	2.09	1.24	1.10	0.60	0.38	0.72	0.35	0.17	0.03	-0.07	0.14	0.49
11	4.22	1.57	-0.49	-0.92	0.40	0.72	0.35	-0.09	0.55	0.09	0.06	0.10
12	3.97	1.58	-0.32	-0.97	0.49	0.71	0.54	0.11	0.72	0.06	-0.07	-0.10
13	1.50	1.06	2.72	7.48	0.48	0.71	0.51	0.64	0.03	0.08	-0.04	0.19
14	3.93	1.85	-0.20	-1.44	0.21	0.73	0.04	-0.07	0.08	0.01	-0.11	-0.07
15	2.13	1.38	1.30	0.98	0.42	0.72	0.36	0.24	-0.06	-0.05	0.03	0.47
16	5.36	1.23	-2.22	4.33	0.38	0.72	0.28	-0.35	0.36	-0.11	0.09	0.16
17	5.11	1.53	-1.70	1.55	0.44	0.72	0.28	-0.20	0.46	-0.09	0.06	0.02
18	5.39	1.14	-2.26	4.65	0.62	0.70	0.39	-0.23	0.48	0.04	0.02	-0.14
19	3.02	1.64	0.45	-0.93	0.12	0.74	0.27	0.18	0.48	0.00	-0.02	0.24
20	3.84	1.84	-0.24	-1.35	0.30	0.73	0.34	0.00	0.34	0.39	0.10	0.09
Explained variance (%)								13	11	7	6	5

Factor loading > 0.30 in bold.

items presented psychometric properties that did not conform to expectations. Therefore, we decided to remove the items that did not meet a minimum following common recommendation [37,38]. We retain items that (1) had coefficients exceeding 0.40 on the target factor, (2) loaded at least twice as strongly on the target factor as on the next highest loading factor, (3) did not load more than 0.30 on multiple factors, and (4) had communalities exceeding 0.20. We were left with a pool of 13 items that loaded onto three factors.

Taking the pool of 13 items, we used the second random subsample to perform a confirmatory factor analysis (CFA) [36]. However, since we had retained only 13 of the original 20 items, another EFA was previously performed. The Kaiser–Meyer–Olkin test of sampling adequacy (0.70) and Bartlett’s test of sphericity ($\chi^2=300.47$, $p < 0.001$) indicated the adequacy of the data to perform the analysis, it is worth noting that once again the KMO test showed median values indicating that the patterns of correlations were not as compact as expected. In this occasion, a parallel analysis suggested two factors. Another EFA looking for two factors was computed using maximum-likelihood with Oblimin rotation. The mean, standard deviation, skew, kurtosis, item-total correlation, Cronbach’s alpha without the item, communality, and factor loadings in the two factors are presented in Table 2.

Following previous recommendations, we retained a poll of eight items that loaded onto two factors (see Table 3). As data showed multivariate skewness (Mardia’s normalized coefficients of 105.34), we conducted a CFA using maximum-likelihood estimation with robust estimation (Satorra-Bentler scaling corrections) [39]. The two-factor model demonstrated excellent fit to the data ($\chi^2_{(19)}=28.98$, $p < 0.001$, CFI = 0.94, TLI = 0.91, RMSEA (90% IC)=0.05 (0.01, 0.08), SRMR = 0.06). The final items are presented in Table 3.

Internal consistency and construct validity

Both samples were collapsed for the following analyses. First, the internal consistency reliability for the first factor was 0.63 and for the second 0.66. Second, in order to prove the construct validity, Pearson’s zero-order correlations between the two factors of the scale and the other related measures and age were calculated (see Table 4). The two factors of the IDP did not correlate showing that both factors are independent. The first factor, Coping/Succumbing Framework, presented negative correlations with positive and negative affect, with MAS feelings and thoughts, and with attitudes evaluated with the SDT. This means that higher scores in Coping/Succumbing Framework are related to less

Table 2. Statistical analysis of the items and factor structure of the IDP.

Items	M	SD	Skew	Kurtosis	R IT-c	α without item	Factor loadings		
							h^2	F1	F2
1	1.31	0.70	2.78	9.83	0.37	0.53	0.32	-0.17	0.54
2	1.76	1.07	1.50	1.89	0.20	0.57	0.37	0.01	0.61
3	2.49	1.38	0.61	-0.48	0.26	0.55	0.32	0.29	0.48
4	3.12	1.57	0.29	-0.94	0.23	0.56	0.19	0.19	0.40
7	2.92	1.79	0.47	-1.18	0.35	0.53	0.11	0.28	0.17
9	4.65	1.48	-0.83	-0.48	0.65	0.45	0.47	0.68	-0.03
10	2.20	1.27	1.10	0.69	0.41	0.52	0.13	-0.23	0.28
11	4.21	1.56	-0.54	-0.87	0.54	0.48	0.24	0.49	-0.05
12	4.00	1.53	-0.33	-1.01	0.60	0.47	0.47	0.68	0.12
13	1.53	1.07	2.58	6.77	0.27	0.55	0.19	-0.04	0.43
17	5.17	1.48	-1.84	2.19	0.49	0.50	0.15	0.38	-0.08
18	5.38	1.18	-2.14	3.90	0.55	0.48	0.31	0.46	-0.32
19	2.87	1.55	0.53	-0.67	0.19	0.57	0.06	0.09	0.22
Explained variance (%)								14	12

Factor loading > 0.30 in bold.

negative attitudes, cognitions, and affect toward people with disabilities, although it does not mean more positive affect toward them. The second factor, Discomfort in Social, presented a positive relationship with positive affect and negative with negative affect, a positive relation with thoughts and negative with behaviors, and a positive relation with attitudes evaluated with the SDT. In other words, higher scores in Discomfort in Social Interaction were related to positive affect, behaviors, and attitudes, but also to negative affect and thoughts. Finally, both factors presented a negative relation with age; that is, younger people present less discomfort with people with functional diversity.

As for gender, no significant differences appeared in either of the two factors, while for previous contact those with previous contact presented lower scores in the second factor ($M = 4.44$, $SD = 1.07$; $t = 3.18$, $p = 0.002$) than those without previous contact ($M = 4.92$, $SD = 0.94$). In other words, those with no previous contact with people with disabilities presented more discomfort in social interactions.

Discussion

The purpose of this study was to adapt the IDP Scale into Spanish and examine its psychometric properties and its factor structure on data from a Spanish sample. The results showed that neither the items nor the proposed structure matched the data from the Spanish sample. Therefore, an attempt was made to reduce the items based on psychometric parameters in search of a structure that would fit the data.

In a first step, the IDP Scale was translated into Spanish and back into English. The translators aimed for conceptual rather than literal translation of the instrument. It means that at some arguments original Spanish terms were used instead of the exact conversion of the original words. After performing an EFA and a CFA retaining the items that showed the best properties, the results showed a brief and easy Spanish version of IDP with satisfactory psychometric properties. However, a total of 12 items were deleted as they were shown to be problematic validity in terms of their relevance in measuring attitudes toward persons with functional diversity [37,38].

Table 3. Final items for the Spanish version of the IDP.

Item no.	Item
<i>Factor 1: Coping/Succumbing Framework</i>	
1	It is rewarding when I am able to help
2	It hurts me when they want to do something and can't
4	Contact with a disabled person reminds me of my own vulnerability
13	I admire their ability to cope
<i>Factor 2: Discomfort in Social Interaction</i>	
9	I feel uncomfortable and find it hard to relax
11	I can't help staring at them
12	I feel unsure because I don't know how to behave
17	I am afraid to look at the person straight in the face

Table 4. Means, standard deviations, and correlations involving all variables.

	1	2	M	SD
1. IDP F1			1.92	0.79
2. IDP F2	-0.04		4.49	1.08
3. PANAS positive	-0.20***	0.14**	1.80	0.91
4. PANAS negative	-0.10*	-0.27***	0.53	0.40
5. MAS feelings	-0.11*	-0.06	1.97	0.57
6. MAS thoughts	-0.25***	0.22***	3.83	0.74
7. MAS behaviors	-0.05	-0.10*	1.70	0.73
8. SDT	-0.21***	0.11**	5.29	1.11
9. Age	-0.13**	-0.17***	29.22	14.03

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The final Spanish version of IPD was composed of two factors, four less than the original version due to cultural diversity [14,15]. The two factors were identified using EFA. Our first factor solution was Coping/Succumbing Framework, this was composed by four items (1, 2, 4, 13) and the second factor was Discomfort in Social Interaction, this was composed by four items (9, 11, 12, 17). According to Kline's criterion [40], our results exposed that the internal reliability coefficient was acceptable for both factors ($\alpha = 0.63$; $\alpha = 0.66$). An acceptable internal reliability coefficient depends on factors such as number and type of items, testing procedures, and variability in the sample [41]. It is possible that the reason why the internal reliability coefficient for two factors was below 0.7 may be that there are a small number of contained items into each factor [37].

The CFA was performed to confirm the factorial structure with two factors: Coping/Succumbing Framework and Discomfort in Social Interaction. For research purposes, it is recommended that cut points for these indices were used guidelines for evaluating goodness of fit: $\chi^2/df < 3.0$, the CFI, TLI > 0.9 while the RMSEA < 0.08 and SRMR ≤ 0.08 [37,42,43]. Based on the results, the χ^2/df , CFI, TLI, RMSEA, and SRMR for the two-factor model all met the criteria. The overall CFA results provided support for the two-factor structure for the Spanish adaptation of the IDP.

Regarding external validity, the two factors of the Spanish IDP showed to be independent. The first factor, Coping/Succumbing Framework, presented a negative relationship with positive and negative affect, with MAS feelings and thoughts, and with attitudes evaluated with the SDT. The second factor, Discomfort in Social, presented an association with positive and negative affect, with thoughts, behaviors, and with attitudes evaluated with the SDT. Finally, both factors presented a negative relation with age and positive relation with no previous contact with persons with functional diversity. Our finding is in consonance with previous studies, which described that younger people present less discomfort toward persons with functional diversity [44–48]. Authors reported significant differences between younger and older persons in the attitudes toward persons with functional diversity. Finally, we detect that no previous contact with persons with functional disability presented more discomfort in social interactions and no different between gender were found.

Limitations

This study had some limitations to be addressed. The main limitation of this study was using a type of non-probability sampling technique to collect the participants. Participants for this study were collected using the "snowball" technique using group of students and research assistants who asked classmates, friends, acquaintances, and family members to complete them. Consequently, since a representative sample was not achieved and the selection of participants was based on convenience, the generalizability of the results is not guaranteed. Additionally, this study may include a social desirability-related respondent bias because it was based on a self-reported survey and, because it was conducted using the "snowball" technique, the researchers had no control over the conditions under which the survey was completed. Thus, we are not sure that the participants accurately reported their beliefs and attitudes toward persons with functional diversity. In fact, it is possible that the use of the term "functional diversity" instead of "disability" may have affected by generating more desirability. It should also be noted that this study assessed the subjective perception of the attitudes toward

persons with functional diversity, not the attitudes or actual behaviors themselves.

Conclusions

In the present study, it demonstrates that the Spanish IDP Scale is an acceptable, reliable, and validated tool to assess attitude of Spanish population toward social interactions with persons with functional diversity. The analysis of construct validity through EFA and CFA presents a satisfactory model, thus the Spanish IDP Scale can be implanted as a useful tool for the assessment of attitudes toward persons with functional diversity in Spanish speaking people. However, minor adjustment and further evaluation of some items could be considered if reconsidering or improving the psychometric soundness for future use in Latin American speech communities. Therefore, this tool will be a much-needed, useful, and appropriate aid to assess the attitudes toward persons with functional diversity of general population.

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References

- [1] World Health Organization. Summary world report on disability. World Health Organization; 2011. p. 1–24 [cited 2021 Mar 18]. Available from: www.who.int/about/licensing/copyright_form/en/index.html%0Ahttp://www.larchetoronto.org/wordpress/wp-content/uploads/2012/01/launch-of-World-Report-on-Disability-Jan-27-121.pdf
- [2] World Health Organization. How to use the ICF: a practical manual for using the International Classification of Functioning, Disability and Health (ICF). Geneva; 2013.
- [3] Palacios A, Romañach J. El modelo de la diversidad: la bioética y los derechos humanos como herramientas Para alcanzar la plena dignidad en la diversidad funcional. *Diversitas*. 2006;1:13–27.
- [4] Palacios A, Javier R. Diversity approach: a new view on bioethics from the functionally diverse (disabled) people. *Diversitas*. 2007;1:1–14.
- [5] Simplican SC, Leader G, Kosciulek J, et al. Defining social inclusion of people with intellectual and developmental disabilities: an ecological model of social networks and community participation. *Res Dev Disabil*. 2015;38:18–29.
- [6] Bigby C. Social inclusion and people with intellectual disability and challenging behaviour: a systematic review. *J Intellect Dev Disabil*. 2012;37(4):360–374.

- [7] Mason C, Weber J. What predictors are associated with the social inclusion of people with disabilities? A comparison of community-based rehabilitation participants to the general population in Vietnam. *Disabil Rehabil.* 2021;43(6): 815–822.
- [8] Corthouts J, Thibaut E, Breuer C, et al. Social inclusion in sports clubs across Europe: determinants of social innovation. *Innovation.* 2020;33:21–51.
- [9] United Nations. Convention on the rights of persons with disabilities; 2006 [cited 2021 Mar 18]. Available from: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>
- [10] García-González JM, Gutiérrez Gómez-Calcerrada S, Solera Hernández E, et al. Barriers in higher education: perceptions and discourse analysis of students with disabilities in Spain. *Disabil Soc.* 2021;36(4):579–595.
- [11] Requero B, Santos D, Paredes B, et al. Attitudes toward hiring people with disabilities: a meta-cognitive approach to persuasion. *J Appl Soc Psychol.* 2020;50(5): 276–288.
- [12] Khayat-zadeh-Mahani A, Wittevrongel K, Nicholas DB, et al. Prioritizing barriers and solutions to improve employment for persons with developmental disabilities. *Disabil Rehabil.* 2020;42(19):2696–2706.
- [13] Palad YY, Barquia RB, Domingo HC, et al. Scoping review of instruments measuring attitudes toward disability. *Disabil Health J.* 2016;9(3):354–374.
- [14] Gething L, Wheeler B. The Interaction with Disabled Persons Scale: a new Australian instrument to measure attitudes towards people with disabilities. *Aust J Psychol.* 1992;44(2):75–82.
- [15] Gething L. The Interaction with Disabled Persons Scale. *J Soc Behav Personal.* 1994;9:23–42.
- [16] Wallymahmed AH, McKay-Moffat SF, Cunningham CC. The Interaction with Disabled Persons Scale: a validation with UK midwives. *Soc Behav Pers.* 2007;35(8):1049–1060.
- [17] Thomas A, Palmer JK, Coker-Juneau CJ, et al. Factor structure and construct validity of the Interaction with Disabled Persons Scale. *Educ Psychol Meas.* 2003;63(3): 465–483.
- [18] Bania TA, Antoniou A-S, Theodoritsi M, et al. The Interaction with Disabled Persons Scale: translation and cross-cultural validation into Greek. *Disabil Rehabil.* 2019;0: 1–8.
- [19] Hutzler Y. Attitudes toward the participation of individuals with disabilities in physical activity: a review. *Quest.* 2003; 55(4):347–373.
- [20] Reina R, Hutzler Y, Iniguez-Santiago MC, et al. Student attitudes toward inclusion in physical education: the impact of ability beliefs, gender, and previous experiences. *Adapt Phys Activ Q.* 2019;36(1):132–149.
- [21] Vornholt K, Uitdewilligen S, Nijhuis FJN. Factors affecting the acceptance of people with disabilities at work: a literature review. *J Occup Rehabil.* 2013;23(4):463–475.
- [22] Tervo RC, Azuma S, Palmer G, et al. Medical students' attitudes toward persons with disability: a comparative study. *Arch Phys Med Rehabil.* 2002;83(11):1537–1542.
- [23] Armstrong M, Morris C, Abraham C, et al. Children's contact with people with disabilities and their attitudes towards disability: a cross-sectional study. *Disabil Rehabil.* 2016; 38(9):879–888.
- [24] Macmillan M, Tarrant M, Abraham C, et al. The association between children's contact with people with disabilities and their attitudes towards disability: a systematic review. *Dev Med Child Neurol.* 2014;56(6): 529–546.
- [25] Penny NH, Kasar J, Sinay T. Student attitudes toward persons with mental illness: the influence of course work and level I fieldwork. *Am J Occup Ther.* 1990;28: 217–220.
- [26] Yazbeck M, McVilly K, Parmenter TR. Attitudes toward people with intellectual disabilities. *J Disabil Policy Stud.* 2004; 15(2):97–111.
- [27] Carretero-Dios H, Pérez C. Standards for the development and review of instrumental studies: considerations about test selection in psychological research. *Int J Clin Health Psychol.* 2007;7:863–882.
- [28] Beaton DE, Bombardier C, Guillemin F, et al. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine.* 2000;25(24):3186–3191.
- [29] Carretero-Dios H, Pérez C. Normas Para el desarrollo y revisión de estudios instrumentales. *Int J Clin Health Psychol.* 2005;5:521–551.
- [30] Palacios A, Románach J, Ferreira MAV, et al. Functional diversity, bioethics and sociological theory: a new approach to disability. *Rev Soc Pens Crít.* 2012;6:115–130.
- [31] Sandín B, Chorot P, Lostaos L, et al. Escalas PANAS de afecto positivo y negativo: validación factorial y convergencia transcultural [The PANAS scales of positive and negative affect: factor analytic validation and cross-cultural convergence]. *Psicothema.* 1999;11:37–51.
- [32] Stevens LF, Getachew MA, Perrin PB, et al. Factor analysis of the Spanish Multidimensional Attitudes Scale toward persons with disabilities. *Rehabil Psychol.* 2013;58(4): 396–404.
- [33] Osgood CE. The nature and measurement of meaning. *Psychol Bull.* 1952;49(3):197–237.
- [34] Jenaro C, Flores N, López-Lucas J. Using the Semantic Differential Technique to assess stereotypes toward individuals with disabilities: the relevance of warmth and competence. *Univ Psychol.* 2018;17:1–12.
- [35] R Core Team. R: a language and environment for statistical computing. Vienna (Austria): R Foundation for Statistical Computing; 2019.
- [36] Horn JL. A rationale and test for the number of factors in factor analysis. *Psychometrika.* 1965;30:179–185.
- [37] Child D. The essentials of factor analysis. 3th ed. London: Continuum; 2006.
- [38] Tabachnick BG, Fidell L. Using multivariate statistics. 6th ed. California: Pearson; 2013.
- [39] Satorra A, Bentler PM. A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika.* 2001;66(4):507–514.
- [40] Kline P. Personality: the psychometric view. 5th ed. London: Routledge; 2000.
- [41] Asendorpf JB, Conner M, De Fruyt F, et al. Recommendations for increasing replicability in psychology. *Eur J Pers.* 2013;27(2):108–119.
- [42] Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Model A Multidiscip J.* 1999;6(1): 1–55.

- [43] Bentler PM. Comparative fit indexes in structural models. *Psychol Bull.* 1990;107(2):238–246.
- [44] Zheng Q, Tian Q, Hao C, et al. Comparison of attitudes toward disability and people with disability among caregivers, the public, and people with disability: findings from a cross-sectional survey. *BMC Public Health.* 2016;16(1):1024.
- [45] Patka M, Keys CB, Henry DB, et al. Attitudes of Pakistani community members and staff toward people with intellectual disability. *Am J Intellect Dev Disabil.* 2013;118(1):32–43.
- [46] Uysal A, Albayrak B, Koçulu B, et al. Attitudes of nursing students toward people with disabilities. *Nurse Educ Today.* 2014;34(5):878–884.
- [47] Morin D, Valois P, Crocker AG, et al. Attitudes of health care professionals toward people with intellectual disability: a comparison with the general population. *J Intellect Disabil Res.* 2018;62(9):746–758.
- [48] Morin D, Rivard M, Crocker AG, et al. Public attitudes towards intellectual disability: a multidimensional perspective. *J Intellect Disabil Res.* 2013;57(3):279–292.