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Psychometric properties of the Spanish version of the Passion Scale

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Abstract

Background: Passion has been shown to be involved in psychological processes that emerge in diverse human activities like physical activity and sports, work, leisure, videogaming, pathological gambling, and interpersonal relationships. We aimed to present evidence of validity and internal consistency of the Passion Scale in Spanish based on the Dualistic Model of Passion, comprising harmonious and obsessive dimensions. **Method:** The sample comprised 1,007 participants (350 females and 657 males), aged 16-65 (Md= 30.0 years). Exploratory Structural Equation Modeling (ESEM), measurement invariance and Multiple-Cause-Multiple-Indicator models (MIMIC) were used. **Results:** Fit for the ESEM 2-factor solution was acceptable. Near full or partial measurement invariance across sex, type of activity, and age was supported. Relationships between both harmonious and obsessive dimensions and the external variables considered (age, sex, and criterion items) reasonably replicated those found in previous studies. Both scale scores showed adequate internal consistency (α = .81). **Conclusions:** Empirical evidence for the validity and internal consistency of the Spanish version of the Passion Scale is satisfactory and reveals that the scale is comparable to the English and French versions. Therefore, the Passion Scale can be used in research conducted in Spanish.

Keywords: Exploratory structural equation modelling; measurement invariance; passion; positive psychology; validity.

Resumen

Propiedades psicométricas de la versión española de la Escala de la Pasión. **Antecedentes:** la pasión es uno de los elementos de los diversos procesos psicológicos presentes en diversas actividades como la actividad física, el deporte, el ocio, el trabajo y las relaciones interpersonales. El objetivo del estudio fue presentar evidencias de validez y fiabilidad de la versión española de la Escala de la Pasión, basada en el modelo dual de la pasión que comprende las dimensiones armoniosa y obsesiva. **Método:** participaron 1.007 personas (350 mujeres y 657 hombres) de 16-65 años (Md= 30). Se usó modelado de ecuaciones estructurales exploratorio (ESEM), invariancia factorial y modelos de múltiples-indicadores-múltiples-causas (MIMIC). **Resultados:** el ajuste de la solución de 2 factores con ESEM fue aceptable. Se obtuvo invariancia casi completa o parcial en función del sexo, el tipo de actividad y la edad. Las relaciones entre ambas dimensiones armoniosa y obsesiva y las variables externas consideradas (edad, sexo e ítems criterio) replicaron razonablemente los resultados de estudios previos. Ambas puntuaciones mostraron una consistencia interna adecuada (α= .81). **Conclusiones:** las evidencias de validez y consistencia interna halladas con la versión española de la Escala de la Pasión son satisfactorias y muestran que la escala es comparable a las versiones inglesa y francesa, pudiéndose usar en investigaciones realizadas en castellano.

Palabras clave: modelado de ecuaciones estructurales exploratorio; invariancia factorial; pasión; psicología positiva; validez.

Most people participate regularly in activities, experiencing feelings of enthusiasm and fun, and accompanied by the conviction that it is worthwhile to carry out the activity. Such engagement can have a deep impact on the psychological functioning of the individual (Vallerand, 2012; Vallerand et al., 2003).

In order to explain how people are influenced by passionate engagement in meaningful activities, Vallerand et al. (2003) developed the Dualistic Model of Passion (DMP) and defined passion as an strong inclination towards a self-defining activity that a person loves, considers important, and in which he/she invests a great deal of time and energy. This inclination appears after a period of practicing and after discovering the activities that are experienced as satisfactory or fun by the individual. Some of these will be perceived as having special importance and as being in line with the person's sense of identity and self-perception. Such perceptions create a tight relationship between the individual and the activity, and then the activity will be considered passionate and becomes an element of personal identity (Mageau et al., 2009; Vallerand, 2012, 2015).

According to the DMP, there are two distinct types of passion: harmonious passion (HP) and obsessive passion (OP). HP is the result of internalising an activity as part of one's identity, which occurs when one freely chooses to engage in the beloved activity, without any pressure or contingencies. Even though such an activity occupies an important position in an individual's identity, its presence is not overwhelming and it leaves room for other life interests without interfering with interests in other fields. The

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passionate implication in an activity is fully voluntary and flexible. This type of passion fits in well with other aspects and activities of a person's life, and leads to a flexible engagement in the activity. Indeed, when one experiences HP, the activity remains under the individual's control in such a way that he or she can decide when and when not to engage in the activity. Whenever the conditions take a turn for the worst, the person can stop for a while or even put an end to any involvement in the activity.

In contrast, OP is postulated as the result of an internalisation of the activity in one's identity, which occurs when the activity becomes associated with inter-or intra-personal contingencies, such as feelings of self-esteem or social acceptance (Vallerand et al., 2003). OP entails an over-identification with the activity, such as when the activity occupies an individual's thoughts and overcomes his or her sense of identity. In this state, the activity becomes more important than other life interests. An individual with OP experiences an uncontrollable urge to engage in the activity, and even experiences conflict between this and other activities and interests. Such conflict may also lead to negative affect and obsessive thoughts regarding the activity when not engaging in it. Moreover, OP leads to a rigid persistence in the activity. Indeed, persistence can occur even in situations that involve high risks to oneself and to others, for example, athletes overtraining with serious risks of injuries.

Passion has been shown to be a construct involved in psychological processes that appear in many different fields of human activity, such as physical activity and sports, arts, work, leisure, use of videogames, pathological gambling or interpersonal relationships (Curran, Hill, Appleton, Vallerand, & Standage, in press; Vallerand & Verner-Filion, 2013). Zigarmi, Nimon, Houson, Witt and Diehl (2009) suggested that passion could help to understand the overlaps between implication, commitment and engagement, expressions used with different senses in applied and academic contexts. Vallerand suggests that passion is a pathway to engagement, optimal performance, and intrinsic joy, even amidst difficulties and setbacks, because it fuels motivation and enhances well-being. However, passion can also arouse negative emotions, lead to inflexible persistence, and interfere with the achievement of a balanced and successful life (Vallerand & Verner-Filion, 2013).

To measure DMP, the Passion Scale was developed (Marsh et al., 2013; Vallerand et al., 2003). The scale includes two six-item subscales assessing harmonious (HP) and obsessive (OP) passion toward an activity. It also includes a set of four, or more recently, five criterion single-items used as correlates assessing whether the participants' involvement in the activity can be considered a passion: time (time spent on the activity), liking (love for the activity), value (activity valuation), passion (the activity perceived as a passion), and identity (the activity perceived as a part of one's identity), this latter not being included in earlier versions. All questions are rated on a 7-point Likert-type scale (1= *total disagreement*; 7= *total agreement*) (Table 1).

Over 20 studies have provided support for the factor structure of the Passion Scale through exploratory and confirmatory factor analyses (see Vallerand, 2015, Chap. 4, for a review; e.g., Marsh et al., 2013; Rousseau, Vallerand, Ratelle, Mageau, & Provencher, 2002; Vallerand et al., 2003, 2006). The Passion Scale has also shown good internal consistency and predictive, discriminant, and external validity (i.e., Vallerand, 2010, 2015). Furthermore, both HP and OP scores have correlated highly with the passion criteria of activity valuation and loving, time and energy expenditure for the activity, measures of the activity being perceived as a passion, thereby providing support for the definition of passion (Vallerand et al., 2003). Marsh et al. (2013) also showed that the Passion Scale items are equally appropriate for different activities and languages (English and French) and reasonably invariant across gender and age.

Research also reveals that the Passion Scale has shown its usefulness as a predictor of outcomes or as a mediator, both in the English and French languages (Marsh et al., 2013). Recent reviews (Curran et al., in press; Vallerand, 2015; Vallerand & Verner-Filion, 2013) have shown that HP promotes more adaptive outcomes on a number of intrapersonal outcomes, such as positive emotions and flow, psychological well-being, physical health, interpersonal relationships, and performance, whereas OP contributed to negative cognitions and correlated positively with

Table 1
Spanish version of the Passion Scale [English version in brackets]

Items content*
1. Mi *actividad* está en armonía con las otras actividades de mi vida [HP1: This activity is in harmony with the other activities in my life]
2. Tengo dificultad para controlar la urgencia para hacer mi *actividad* [OP1: I have difficulties controlling my urge to do my activity]
3. Las cosas nuevas que descubro con esta *actividad* me permite apreciarla todavía más [HP2: The new things that I discover with this activity allow me to appreciate it even more]
4. Tengo casi un sentimiento obsesivo respecto a esta *actividad* [OP2: I have almost an obsessive feeling for this activity]
5. Esta *actividad* refleja las cualidades que me gustan de mí mismo/a [HP3: This activity reflects the qualities I like about myself]
6. Esta *actividad* me permite vivir variedad de experiencias [HP4: This activity allows me to live a variety of experiences]
7. Esta *actividad* es la única que verdaderamente me activa [OP3: This activity is the only thing that really turns me on]
8. Esta *actividad* está bien integrada en mi vida [HP5: My activity is well integrated in my life]
9. Si pudiera, solo haría esta *actividad* [OP4: If I could, I would only do my activity]
10. Esta *actividad* está en armonía con otras cosas que son parte de mí [HP6: My activity is in harmony with other things that are part of me]
11. Esta *actividad* es tan excitante que a veces pierdo el control sobre ella [OP5: This activity is so exciting that I sometimes lose control over it]
12. Tengo la impresión de que la *actividad* me controla [OP6: I have the impression that my activity controls me]
13. Paso mucho tiempo practicando esta *actividad* [C13: I spend a lot of time doing this activity]
14. Me gusta esta *actividad* [C14: I like this activity]
15. Esta *actividad* es importante para mí [C15: This activity is important for me]
16. Esta *actividad* es una pasión para mí [C16: This activity is a passion for me]
17. Esta *actividad* forma parte de lo que soy [C17: This activity is part of who I am]**
Scoring key
Pasión armoniosa (HP): 1, 3, 5, 6, 8, 10
Pasión obsesiva (OP): 2, 4, 7, 9, 11, 12
Criterios pasión (C): 13, 14, 15, 16, (17)

* The term "*actividad*" is generic and can be adapted to the specific activity.
** Not included in earlier versions

performance and behaviour. Harmoniously passionate individuals report an approach to activities with a pattern of motivation to learn and develop, experiencing low activity conflicts and high life satisfaction. In contrast, individuals with OP are limited to impoverished functioning because they experience a non-integrated self-regulation, negative affect and engage in activities compulsively. In line with the age and sex invariance of the Passion Scale (Marsh et al., 2013), relationships between passion and intrapersonal outcomes are invariant. When comparing means, females show a stronger life satisfaction-harmonious passion relationship, and older workers show a stronger burnout-obsessive passion relationship (Curran et al., in press).

A specific validation of an earlier 14-item Passion Scale version in work and organizational settings was carried out in Spanish by Orgambídez-Ramos, Borrego-Alés, and Gonçalves (2014), but the internal structure was only explored by means of principal component analysis. While an appropriate initial start, this type of analysis is insufficient to demonstrate validity in another language. Additionally, the previous Spanish version does not include the criterion items that allow determining the extent of the passion experienced by the respondents. Despite the relevance and potential of this previous study, and the use of the Passion Scale in Spanish across passion activities (i.e., Chamarro, Martos, Parrado, & Oberst, 2011; Fuster, Chamarro, Carbonell, & Vallerand, 2014), the validation of the entire scale for general purposes in Spanish remains an important issue.

In line with the above, the objective of the present study was to provide evidence of the internal consistency and the validity of the Spanish version of the Passion Scale. Specifically, we aimed to study the factor structure of the Passion Scale, its measurement invariance across sex, type of activity and age, and its relationships with other variables such as age, sex, and criterion measures, like Marsh et al. (2013). In line with their findings, we expected to confirm a two-factor structure, equivalent across groups. Further, because the four single-item ratings of the passion activity are intended to represent different components of passion, we expected that they would be positively related mainly to both passion subscales. However, liking was expected to be more strongly related to HP, whereas time was expected to be more strongly predicted by OP. Finally, in line with Marsh et al. (2013), OP was expected to decline with age and then to increase with age.

Method

Participants

As in Marsh et al. (2013), we used a data set of Passion Scale responses consisting of six nonclinical unscreened Spanish samples as a combination of published and unpublished data not previously used for the psychometric validation of the Passion Scale. The whole sample comprised 1,007 participants (350 females and 657 males) aged 16-65 (*Md* = 30.0 years). Video-gamers had an average age of 26.58 years (*SD* = 6.80 years), age range 16-45 years, average experience of 6.06 years (*SD* = 3.04 years). The skiers had an average age of 39.21 years (*SD* = 9.50 years), age range 16-65 years, average experience of 15.05 years (*SD* = 11.33 years). The belly dancers had an average age 34.87 years (*SD* = 8.23 years), age range 18-57 years and average experience of 6.59 years (*SD* = 3.42 years). Salsa dancers had an average age of 31.58 years (*SD* = 9.61 years), age range 16-59, average experience of 4.57 years (*SD* = 4.25 years). Break-dancers had an average age of 20.74 (*SD*= 3.49 years), age range 16-32 (no experience available). Karate practitioners had a mean age of 25.77 years (*SD* = 9.42 years), age range 16-52, average experience of 8.94 years (*SD* = 9.06 years) (see Table 2).

Instruments

For the adaptation into Spanish, a translation of the revised English Passion Scale (Marsh et al., 2013) was performed by a Spanish-speaking psychologist and then revised by a bilingual psychologist. Additionally, a committee of both Spanish-speaking and bilingual psychologists verified the translation. In case of discrepancies, consensus was reached. This procedure is in accordance with the standards for cross-cultural adaptation (Muñiz, Elosua, & Hambleton, 2013).

Procedure

Sampling was conducted during 2011-2015. Videogame players were contacted through several Spanish-speaking videogames forums. The message included a brief explanation of how to complete the questionnaire and a link to it. When the participants accessed the questionnaire, they were shown a page titled "Informed Consent", which stated that by clicking the button "next", they agreed to participate in the research and to answer the questionnaire (for more details, see Fuster et al., 2014). Skiers were contacted through a message posted on a specialised website where skiers can share their routes and obtain updates about snow conditions. Before accessing the questionnaire, they also had to give informed consent. Salsa dancers were contacted at dancing academies around Barcelona and answered a paper-and-pencil questionnaire including informed consent. Simultaneously, dancers living away from Barcelona were contacted through online social networks and answered an on-line version with informed consent.

Table 2
Information of the six samples of data used in the present investigation

Sample	N	Activity	Mean age (SD)	% Men	Correlates[a]
1	430	Videogaming	26.58 (6.80)	95.3%	C13 C14 C15 C16
2	46	Sport and physical activity (belly dance)	34.87 (8.23)	0%	C13 C14 C15 C16
3	19	Sport and physical activity (breakdance)	20.74 (3.49)	36.8%	C13 C14 C15 C16
4	193	Sport and physical activity (salsa dance)	31.58 (9.61)	0%	C13 C14 C15 C16
5	284	Sport and physical activity (ski)	39.21 (9.50)	75.0%	C13 C14 C15 C16
6	35	Sport and physical activity (karate)	25.77 (9.42)	77.1%	C13 C14 C15 C16

[a]The correlates consist of four single-item scales (C13= Time, C14= Liking, C15= Value, C16= Passion)

The rest of the participants were contacted directly at the places where they practised their activities and they answered a paper-and-pencil version of the questionnaire and an informed consent form.

Data analyses

First, based on Marsh et al. (2013), the factor structure was examined using Exploratory Structural Equation Modeling (ESEM; Asparouhov & Muthén, 2009) with Mplus7.1 (Muthén & Muthén, 2008-2012). We used robust maximum-likelihood estimator (MLR), a full-information method for handling missing data (Graham, 2009), which is also robust to non-normality, and Geomin rotation. The ESEM approach differs from the typical confirmatory factor analysis (CFA) in that all factor loadings are estimated, subject to constraints necessary for identification, instead of the highly restrictive CFA, in which all cross-loadings are constrained to be zero. Model fit was evaluated based on the comparative fit index (CFI), Tucker-Lewis index (TLI), root-mean-square error of approximation (RMSEA), standardized root mean square residual (SRMR), χ^2, and evaluation of parameter estimates. As for CFA, CFI and TLI > .90, RMSEA < .08 and SRMR < .1 typically reflect acceptable fit, and CFI and TLI > .95, RMSEA < .06 and SRMR < .08 indicate excellent fit (Brown, 2006; Marsh et al., 2013). For responses to the 12 Passion Scale items, the 2-factor model (HP and OP) with two correlated uniquenesses proposed by Marsh et al. (2013) was evaluated.

Second, measurement invariance across sex, type of activity and age was analysed, comparing progressively more constrained nested models across groups following the common sequence (Vandenberg & Lance, 2000). For the continuous variable age, the multigroup analysis was performed by dividing the sample in three roughly equal groups by computing the tertiles; the cut-off points were 25 and 35 years old. As a starting point, configural invariance (equal form) implies the same number of factors and the same items defining each construct. Next, measurement invariance (in a narrow sense) implies the three following steps. Test for equivalence of factor loadings (metric or weak invariance) implies that the constructs themselves are the same across groups, having the same meaning. Adding test for equivalence of item intercepts (scalar or strong invariance) implies that differences between items' mean levels across groups can be explained in terms of differences at the latent factor mean levels. Adding equivalence of item uniquenesses (strict invariance) tests whether the amount of item variance not accounted for by the factor is the same across groups in each item. Strong measurement invariance provides a justification for the interpretation of response-group differences based on latent means, whereas strict measurement invariance is a prerequisite for comparing observed scores that do not control for measurement error. Lastly, structural invariance tests equivalence of the remaining groups of parameters across groups: factor variances and covariances and latent means, the latter such as more traditional analyses with ANOVA or *t*-test.

For comparisons between nested models, we considered a decrease in CFI > .01 or TLI > .01 and an increase in RMSEA > .015 as indicators of a meaningful decrement in fit and, therefore, of non-invariance (Cheung & Rensvold, 2002; Marsh et al., 2013). However, when sample sizes were unequal (as for analyses across sex), we adopted more stringent criteria for testing equivalence of factor loadings, item intercepts and uniquenesses: a decrease in CFI > .05 and TLI > .05 and an increase in RMSEA > .01 (Chen, 2007). Model identification for each step of the invariance analyses was set as described in Ezpeleta and Penelo (2015), by using the factor-variance strategy. When complete invariance was not obtained, partial invariance was explored by freeing parameters one at a time based on modification indexes.

Third, given the obtained results, the association of sex, type of activity and age was tested in the overall sample using a multiple-indicator multiple-cause (MIMIC; Jöreskog & Goldberger, 1975) structural equation model (Brown, 2006). Thus, a binary variable for sex and for type of activity (females and videogamers coded each as 0), and age as a continuous variable were added as single indicators to freely correlate with the latent variables (i.e., factors). And four, extended models simultaneously evaluated the relation between HP and OP and the four external single-item ratings, by adding paths from the passion factors as predictors to the four outcomes designed to tap different aspects of the passion activity.

Results

Preliminary analyses

Missing responses were low (0.03%) and only 3 participants (0.30%) showed missing values for one or more items. Mean (and standard deviation) values ranged from 4.10 to 5.30 (1.49-1.89) for HP items and from 2.00 to 2.96 (1.46-1.96) for OP items. Since some item distributions deviated significantly from normality (skewness and kurtosis above 1 in absolute value), the use of a robust method of estimation (MLR) was supported.

Factorial structure and measurement invariance across sex and type of activity

The fit of the configural 12-item and 2-factor ESEM solution with two correlated uniquenesses between items OP3 and OP4 and HP1 and HP5 based on Marsh et al. (2013) (Table 3, Model A) was insufficient (CFI= .928, TLI= .884, RMSEA= .085; SRMR= .035). In evaluating the modification indices, it was evident that the inclusion of one more correlated uniquenesses between items OP1 and OP2 on the OP subscale would improve the fit. Its inclusion did not meaningfully alter other parameter estimates and an inspection of the wording of these two items suggests that the inclusion of the correlated uniquenesses is reasonable, since both include aspects related to compulsive involvement on activity. The fit of this modified 2-factor ESEM model (Table 3, Model A+) was acceptable (CFI= .951; TLI= .917, RMSEA= .072; SRMR= .031).

For model A+, all indicators showed factor loadings ≥ .50 on their intended factors. Moreover, each item's factor loading on its intended factor was higher than its estimated cross-loading on non-intended factors, and these cross-loadings were ≤ .30 in absolute value except for item HP3, as in Marsh et al. (2013). For item HP3, the difference between the factor loading for HP (.50) and OP (.34) was above .10; therefore, it was allocated to the HP factor, also according to its content and its contribution to the internal consistency of each scale. Thus, a simple weighting method may be applied when computing direct scores (e.g., Abad, Olea, Ponsoda & García, 2011). Factor correlation parameter (r = .27) provides evidence for two distinguishable factors.

Internal consistency

Internal consistency was satisfactory for both HP (α = .81) and OP (α = .87) scores and all the items contributed to the internal consistency of their scale.

Invariance across sex, type of activity, and age

Regarding sex, acceptable partial invariance was achieved (Table 3, Models B#), since all factor loadings, 11 of 12 item intercepts (91.7%; all except OP3) and 8 of 12 item uniquenesses (66.7%) were equivalent across females and males, in addition to correlated uniquenesses and factor variances and covariances. Latent means (fixed at 0 in the female group) were lower in the male group both for HP (d= -0.787; p<.001) and OP (d= -0.695; p<.001).

Regarding activities, we grouped ski, karate, and dancing into a sport and physical activity group (n = 577) versus the videogame group (n = 430). Acceptable partial invariance was achieved (Table 3, Models C#), as all factor loadings, 10 of 12 item intercepts (83.3%; all except HP3 and OP2) and 8 of 12 item uniquenesses (66.7%) were equivalent across both groups, in addition to correlated uniquenesses and factor variances and covariances. Latent means (fixed at 0 in the videogame group) were higher in the sport and physical activity group both for HP (d = 0.974, p<.001) and OP (d = 0.464, p<.001).

Lastly, in relation to age, three groups based on tertiles were considered: younger (n = 351), middle (n = 330), and older (n = 299). Full strong measurement invariance and partial strict measurement invariance were achieved (Table 3, Models D#), as all factor loadings, all item intercepts and all except one

Table 3
Goodness-of-fit indices for the models of Passion Scale evaluated

	Goodness-of-fit indices				Comparison			
Model	**χ^2 (df)**	**CFI**	**TLI**	**RMSEA**	**Models**	**ΔCFI**	**ΔTLI**	**ΔRMSEA**
Baseline ESEM model (whole sample; N = 1007)								
A: 12-item and 2-factor with 2 CU (O3-O4; H1-H5)	339.9 (41)	.928	.884	.085				
A+: A plus 1 CU (O1-O2)	**248.9 (40)**	**.950**	**.917**	**.072**				
Measurement invariance across sex								
B1: A+ configural (equal form)	303.9 (80)	.941	.903	.075				
B2: B1 plus equal factor loadings (weak invariance)	346.5 (100)	.935	.915	.070	B2 vs. B1	–.006	.012	–.005
B3: B2 plus equal intercepts (strong invariance)	412.3 (110)	.921	.905	.074	B3 vs. B2	–.014	–.010	.004
B3+: B3 except 1 intercept unequal (partial)	387.5 (109)	.927	.912	.071	B3+ vs. B2	–.008	–.003	.001
B4: B3+ plus equal uniquenesses (strict invariance)	502.0 (121)	.900	.891	.079	B4 vs. B3+	–.027	–.021	.008
B4+: B4 except 4 uniquenesses unequal (partial)	431.5 (117)	.918	.907	.073	B4+ vs. B3+	–.009	–.005	.002
B5: B4+ plus equal CU	434.3 (120)	.918	.909	.072	B5 vs. B4+	0	.002	–.001
B6: B5 plus equal factor variances and covariances	**465.9 (123)**	**.910**	**.903**	**.074**	B6 vs. B5	–.008	–.006	.002
B7: B6 plus equal factor means	610.3 (125)	.873	.866	.088	B7 vs. B6	–.037	–.037	.014
Measurement invariance across type of activity								
C1: A+ configural (equal form)	261.5 (80)	.952	.920	.067				
C2: C1 plus equal factor loadings (weak invariance)	318.4 (100)	.942	.923	.066	C2 vs. C1	–.010	.003	–.001
C3: C2 plus equal intercepts (strong invariance)	432.0 (110)	.914	.897	.076	C3 vs. C2	–.028	–.026	.010
C3+: C3 except 2 intercepts unequal (partial)	360.0 (108)	.933	.918	.068	C3+ vs. C2	–.009	–.005	.002
C4: C3+ plus equal uniquenesses (strict invariance)	539.2 (120)	.888	.877	.083	C4 vs. C3+	–.045	–.041	.015
C4+: C4 except 4 uniquenesses unequal (partial)	405.0 (116)	.923	.912	.070	C4+ vs. C3+	–.010	–.006	.002
C5: C4+ plus equal CU	400.2 (119)	.925	.917	.069	C5 vs. C4+	.002	.005	–.001
C6: C5 plus equal factor variances and covariances	**431.6 (122)**	**.918**	**.911**	**.071**	C6 vs. C5	–.007	–.006	.002
C7: C6 plus equal factor means	584.2 (124)	.878	.870	.086	C7 vs. C6	–.040	–.041	.015
Measurement invariance across age (3 groups)								
D1: A+ configural (equal form)	369.2 (120)	.941	.903	.080				
D2: D1 plus equal factor loadings (weak invariance)	423.2 (120)	.938	.923	.071	D2 vs. D1	–.003	.020	–.009
D3: D2 plus equal intercepts (strong invariance)	473.7 (180)	.931	.924	.071	D3 vs.D2	–.007	.001	0
D4: D3 plus equal uniquenesses (strict invariance)	558.3 (204)	.916	.919	.073	D4 vs. D3	–.015	–.005	.002
D4+: D4 except 1 uniqueness unequal (partial)	518.9 (203)	.925	.927	.069	D4+ vs. D3	–.006	.003	–.002
D5: D4+ plus equal CU	535.6 (209)	.923	.927	.069	D5 vs. D4+	–.002	0	0
D6: D5 plus equal factor variances and covariances	555.2 (215)	.920	.926	.070	D6 vs. D5	–.003	–.001	.001
D7: D6 plus equal factor means	**588.0 (219)**	**.913**	**.921**	**.072**	D7 vs. D6	–.007	–.005	.002
Single-group (whole sample; N = 980)								
E1: A+ plus MIMIC (group, age, and sex)	481.5 (70)	.915	.876	.077				
E2 (extended): E1 plus external outcomes as criteria	729.8 (122)	.910	.898	.070				

CU means correlated uniquenesses; in bold: final model

uniqueness in the older group (item OP6) were equivalent across the three age groups, in addition to correlated uniquenesses, factor variances and covariances and latent means (fixed at 0 in the younger group).

For the three invariance analyses, all models showed SRMR values between .031 and .104, except models B7 (.161), C4 (.113), and C7 (.158) (detailed values not shown in Table 3). Thus, invariance findings provide reasonable support for the invariance of the Passion Scale for both sexes, type of activities, and age groups.

Effect of sex, age and their interaction, and type of activity

Further analyses were conducted over all participants, by including external indicators with a MIMIC structure into the ESEM approach. In addition to main (first-order) effects of type of activity, sex and age (the two former as binary indicators and the latter as continuous variable), we also considered the nonlinear (quadratic) components of age and the age-by-sex interaction. Since the quadratic effect of age, and the interactions between both the linear and quadratic effects of age with sex were not statistically significant, these terms were removed; therefore, only main effects for type of activity, sex and the linear effect of age were maintained (Table 3, Model E1). Sport and physical activity participants and females scored higher than video-gamers and males, respectively, whereas both HP, and especially OP, declined with age (negative linear effect).

Table 4
Standardized parameters for the final solution in the whole sample (Model E2 in Table 3)

Parameters	Harmonious-F1	Obsessive-F2	Item uniqueness[a]	Item intercept
Factor loadings				
HP1	**.525**	–.096	.756	3.262
HP2	**.560**	.165	.585	3.414
HP3	**.570**	.273	.476	2.179
HP4	**.577**	.205	.530	3.103
HP5	**.566**	(.001)	.679	3.325
HP6	**.669**	(–.031)	.568	2.817
OP1	(.029)	**.610**	.613	2.122
OP2	(.021)	**.774**	.388	2.154
OP3	.114	**.582**	.595	1.814
OP4	(.045)	**.620**	.592	1.726
OP5	–.154	**.874**	.321	2.144
OP6	–.236	**.872**	.349	2.045
Factor correlations				
F1	1			
F2	.274	1		
External indicators[b]				
Type of activity	1.230	0.597		
Sex	–0.153	–0.343		
Age	–.095	–.257		
External criteria				
Value (C15)	.585	.292		
Passion (C16)	.540	.378		
Time (C13)	(–.141)	.538		
Liking (C14)	.585	(.004)		

[a] Correlated uniqueness: OP3-OP4=.439; HP1-HP5=.385; OP1-OP2=.368.
[b] Type of activity was coded as 0=videogame and 1=sport and physical activity; Sex was coded as 0=females and 1=males; STDY standardisation for type of activity and sex, and STDYX standardisation for age.
In brackets: $p>.05$; in bold: standardized factor loadings >.30

Relation to external correlates

Lastly, extended models related the two latent passion factors to the four single-item ratings tapping different aspects of the passion activity (Table 3, Model E2). Standardised parameters for this comprehensive final model are presented in Table 4. Sport and physical activity participants are 1.230 and 0.597 standardised scores higher than video-gamers on the latent dimensions of HP and OP, respectively, whereas the sex difference (females higher than males) for both HP and OP is a small effect (*d* between 0.153 and 0.343, in absolute value); only OP does decline with age (r = -257), whilst decrease for HP is practically irrelevant (r = -.095).

Regarding external correlates, valuing and passion were similarly highly and positively correlated with both factors (between .29 and .59), although the parameter for valuing was slightly higher for HP than OP. Time was significantly correlated with OP but not with HP and liking was only significantly correlated with HP. This pattern of results provides support for the convergent and discriminant validity of the two passion factors.

This general pattern based on the total sample (Table 4, bottom) is also evident in both groups considered separately (detailed results not shown) with few notable exceptions: valuing is much better predicted by OP for the video-gaming group (r = .557 *vs*. r = .183, both $p<.001$; comparison: z = 6.94, $p<.001$) and time is only predicted by HP for the sport and physical activity group (r = .293, $p<.001$ *vs*. r = .033, p = .559; comparison: z = 4.21, $p<.001$).

Discussion

The objective of this study is to provide evidence on the factor structure and measurement invariance across sex, type of activity and age groups of the Passion Scale adapted to Spanish. Overall, our results support the validity and reliability of the Spanish version. Specifically, the internal structure replicated the original two-factor solution (Vallerand et al., 2003), with similar standardized factor loadings (Marsh et al., 2013). The factor correlation was also very similar to that observed in recent validation studies (Marsh et al., 2013), although correlations between HP and OP may vary with samples in different settings (e.g., Rousseau & Vallerand, 2008). As expected, also measurement invariance across sex and type of activity of the Spanish version was obtained, as in other versions in French and English (Marsh et al., 2013), in addition to measurement invariance across age. Thus, our Spanish validation meets the American Psychological Association's recommendation to provide empirical evidence of psychometric properties in the particular setting in which the test is to be used and also provides data for validity generalization studies (AERA, APA, & NCME, 2014). Additionally, measurement invariance across the groups considered supports the equivalence of the Passion Scale into Spanish across a range of passion activities (Meredith, 1993), as playing videogames (Fuster et al., 2014) or dancing (Chamarro et al., 2011). Taken together, our results support the previous

assumption that the Passion Scale is appropriate over different domains and gender groups (see also, Marsh et al., 2013), and that comparisons among groups are readily interpretable.

Related to external variables, MIMIC models showed that, as partially expected, OP declines with age. Also, HP and OP were both higher for females. The results regarding sex are slightly different to those obtained by Marsh et al. (2013), who observed higher OP for males. The differences may be related to the nature of our samples, with a large number of female dancers. Future studies should verify these patterns.

Additionally, as expected, both HP and OP are positively associated with measures of valuing and passion, as in past research (Marsh et al., 2013; Vallerand et al., 2003). Surprisingly, time was only significantly correlated with OP, whilst liking was only correlated with HP, instead of being both correlated with both criteria (Marsh et al., 2013; Vallerand et al., 2003, Study 1). These relationships may be better understood when we consider the type of activity separately. These results are consistent with Chamarro et al.'s (2011) findings, which show that HP increases with hours of practice. It may be related to the high number of dancers involved in our sport and physical activity sample. In contrast, for videogamers, high involvement is not related to HP (Fuster et al., 2014). Also, liking was predicted by HP but not by OP. This is in line with Marsh et al. (2013), OP being associated with engagement but less with loving the activity. Nevertheless, and from the point of view of validity, the present results showed that while OP and HP were related to the various criteria, these associations varied somewhat for liking and time criteria. Future research is needed to replicate these relationship patterns with other samples.

Although support was obtained for the Spanish version of the Passion Scale, some limitations should be noted. A first limitation for the generalization of this validation lies in the fact that the samples were composed of people who practice videogaming, physical activities and sports. Future studies should replicate the psychometric properties of the Spanish version of the Passion Scale using samples from different activities and in other contexts such as arts, education and work. It should be noted that the sample of our leisure activity, videogaming, was mainly composed of males. Even if it is accepted that in Spain videogaming seems to be more of a male than female activity (Fuster et al., 2012), future studies should replicate our findings on passionate female videogamers. In addition, the temporal stability of scale scores was not assessed and future research should address this issue.

In conclusion, the present study suggests that the Spanish Passion Scale shows an adequate 2-factor structure as expected, which is equivalent for both males and females and types of activity (sport and physical activity and videogaming) and age, and can therefore be considered as equivalent to the English and French versions. Thus, it can be safely used in future research on passion with Spanish-speaking populations. The present validation may be an important step to future studies that analyse the differential effect of passion on intrapersonal and interpersonal outcomes across groups and cultures.

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