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Validation of games and emotions scale (GES-II) to study emotional motor experiences

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Validation of games and emotions scale (GES-II) to study emotional motor experiences

Abstract

Any teacher or coach should have an instrument to study the emotional experiences of a game or sport. The objective of this study was to compare the behavior of the basic emotions in different games, according to the Bisquerra model (MBI) and the internationally agreed biopsychological model (MBPS), through the validated Emotions and Games Scale (GES). We studied 502 university students, who after participating in games of different categories answered the questionnaires GES, PANAS and POMS. The MBPS had a better fit in absolute adjustment indexes, confirmatory factor analysis, parsimony indexes, construct validity and convergent tests. The findings suggest using the GES with the two factors and five basic emotions identified by the MBPS: positive emotion (joy), negative emotion (anger, fear, sadness and rejection).

Keywords: Factor analysis, questionnaire, basic emotions, game, emotional awareness

Any motor task performed by a player triggers an emotional experience (EE) (Hanin, 2007). It is a biopsychosocial reaction which reflects the relationship between the requirements of this motor task and the participant's resources (Hanin, 1999). The experience is a construct which integrates the attitude and the meaning granted by the person to the motor situation (Hanin, 2007). With athletes, emotional experiences during competitions can facilitate or prejudice performance in the test (Arruza, González, Palacios, Arribas and Telletxea, 2013; Robazza, Pellizzari, Bertollo and Hannin, 2008). These emotional states would be partially associated with cognitive states which can interfere with the levels of concentration necessary to adequately execute the motor situation (McCarthy, Allen and Jones, 2012). Research into the emotional aspects of motor tasks is therefore of great importance.

Given the multidimensional nature of the motor EE, it is necessary to adopt transdisciplinary approaches to address the spontaneous (organismic or biological), cognitive and conventional (social or cultural) nature of any EE (e.g. Barret, Ochsner and Gross, 2007; Damasio, 2006; Ekman, 1992; Harré and Parrot, 1996; Scheer, 2012; Van Kleef, 2009). Actor and system; emotion and motor task, are interlinked units which constitute an inseparable binomial (Parlebas, 2001).

There are two basic requirements in order to systematize this scenario. (1) Categorize the extensive repertoire of motor experiences (ME) which any teacher or coach can use to study their possible effects on EE. The motor action theory (Parlebas, 2001) identifies four domains of ME in accordance with the type of motor relationship: psychomotor ME or without motor interaction (e.g. long jump), cooperation ME (e.g. collective dancing), opposition ME (e.g. judo) and cooperation-opposition ME (e.g. basketball). These ME can moreover be performed with or without competition, that is to say that they may or may not be associated with a final score (result). (2) Categorize the repertoire of emotions. Other studies have examined the influence of sporting games on the experience of positive, negative and ambiguous emotions (cf. Duran, Lavega, Planas, Muñoz and Pubill, 2014; Lavega, Alonso, Etxebeste, Lagardera and March, 2014; Lavega, Lagardera, March, Rovira and Araujo, 2014). These research studies took the Bisquerra model (2000) as a theoretical proposal of reference which identifies three clusters of basic emotions: four positive (joy, humor, love and happiness), six negative (anger, sadness, rejection, anxiety, shame and fear) and three ambiguous or neutral (surprise, hope and compassion).

That line of research validated the Games and Emotions Scale (GES) questionnaire (Lavega, March and Filella, 2013), completed by the participants after performing one game from each domain, indicating the emotional intensity experienced (on a Likert scale from 0 to 10). Anomalous situations were observed in the behavior of the GES, such as the difficulty to make use of 0 as no answer in some domains (e.g. Lavega, Lagardera et al. 2014). This limitation could be due to a problem of value range or to the fact that with the Bisquerra model (adapted from Lazarus 1991),

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emotions do not have the same behavior in each game and domain.

Moreover, in the last 30 years the international scientific community has established four characteristics of an emotion to be considered as basic (Tracy and Randles, 2011). (1) It should be a discrete emotion, that is to say activated by some stimuli but not by others, which will show differential neurobiological correlates; (2) it should show a fixed and consistent neural and corporal activity; (3) it should represent a subjective feeling and a specific motivational activation, selected naturally due to phylogenetic interactions with ecologically valid stimuli; (4) it should be found in all human cultures and in similar animals. On being primitive emotions, they should be activated without the need to be preceded by more complex psychological processes, thus being a "pure" emotional experience without the mediation of cognition. On applying these characteristics, the biopsychological models of Ekman (1992), Izard (1994), Levenson (1992) and Panksepp (1982) arise, which currently have the greatest empirical support. These models consider five basic emotions: a positive emotion, joy; and four negative emotions (anger, sadness, fear and rejection).

The objective of this research was thus to compare the behavior of basic emotions, according to the Bisquerra model (2000) or the consensual Biopsychological model (Tracy and Randles, 2011), in different motor experiences, using the GES questionnaire (participants reported their emotional intensity in a 1-7 Likert scale after each motor experience; Lavega et al., 2013). The statistical procedure consisted in several confirmatory factor analyses. One out of the two models (the Bisquerra model or the Biopsychological model) was selected for each motor experience according to the best combination of absolute and parsimony fit indexes.

The final aim is to have an instrument making it possible to study the emotional states in all families of games or sports (corresponding to different domains and types of result), which can be used by any physical activity professional.

Method

Participants

The study was undertaken with 502 participants, 115 women (22.9%) and 387 men (77.1%), the age range varying from 18 to 31 years old (M = 21.2, SD = 2.6). They were first-year students of the physical education speciality taught in 4 Spanish universities (Lleida 43.6%; Murcia, 12.9%; Universidad Católica Murcia, 28.1%; Vitoria, 15.3%). Of them, 364 (72.5%) completed all the tasks necessary to be considered in this validation study. No significant differences were found between the sociodemographic variables and completion of all the tasks considered.

The participants signed an informed consent to participate voluntarily in this study which was approved by the ethics committee of the University of Lleida.

Instruments

After each game, the participants completed the GES scale, identifying the intensity (Likert scale from 1 to 7), in 13 basic emotions (Bisquerra, 2003). They also completed the Positive and Negative Affect Schedule (PANAS), in the Spanish validated version of Sandín, Chorot, Lostao, Joiner, Santed and Valiente, (1999). One of the groups also answered the Profile of Mood States (POMS) questionnaire, in the reduced version adapted to Spanish by Fuentes, Balaguer, Meliá and García-Merita (1995).

Procedure

The data obtained after the games were used to analyze the validity of the GES, given that the intention was to observe the effects of these activities on emotional states.

Eight 50-minute sessions were held during the Physical Activity subject, led by the lecturer responsible for the subject in each of the centers. In each session, two games were carried out of a motor, psychomotor, cooperation, opposition and cooperation-opposition domain of action (with competition: sessions 1, 2, 5 and 8) and without competition (sessions 3, 4, 6 and 7). The aforementioned questionnaires were completed after each game.

Data analysis

The analyses were carried out using the EQS structural equations program (Bentler, 2005). The construct validity was first assessed by confirmatory factor analysis (CFA) in accordance with the two theoretical models used for each game and family of games or domains.

Two basic types of adjustment indexes were analyzed for the two models: (1) The absolute goodness of fit considered the following adjustment indexes: S-Bχ^2 (χ^2 by Satorra-Bentler), Root Mean Square Error of Approximation (RMSEA), Bentler's Comparative Fit Index (CFI), and Bollen's Incremental Fit Index (IFI). (2) A parsimony adjustment measurement was used with the aim of completing the comparison between models, as this index represents a correlation of the statistic χ^2 in order to take into account the complexity of the model in terms of degrees of freedom, Akaike's Information Criterion (AIC).

The data based on Likert-type questionnaires can present problems of normal distribution, given the categorical assessment method used. Thus, polychoric correlations and the robust maximum likelihood estimation method were used. This method provides robust statistics starting from the Satorra-Bentler scaled test of χ^2 (S-Bχ^2) and robust standard errors; errors due to the possible non-fulfilment of the principle of normality can thus be corrected. This analysis guarantees that the values calculated are valid even if the assumption of normality is not respected in the estimation method (Bentler, 2006).

It was estimated that the models were adjusted to the data if the statistic S-Bχ2 was not significant (in accordance with Barret, 2007 and Schweizer, 2010). Also, an adjustment was considered to be good in accordance with the following values for the different indexes: RMSEA < .05; CFI > .95; IFI > .95.

The adjustment was also deemed acceptable between the following values: RMSEA (from .05 to .08): CFI and IFI (.90 to .95). With the AIC statistic, it was observed which of the two models reached a lower value in relation to parsimony. The best model was thus chosen in each case, taking into account all these goodness of fit indexes overall.

In a second phase, convergent and discriminant validity was analyzed using the SPSS v.22.0 statistical program. The correlations of the factors of the two models were compared with the results obtained in the PANAS and POMS questionnaires using the Hotelling-Williams test (Williams, 1959), given the non-independence of the correlations compared.

Results

Confirmatory Factor Analysis (CFA)

First, a CFA was performed of the 2 theoretical models for the 16 games. No model was adjusted to the start data. Thus, using the statistic of Lagrange, covariations were added between errors of the same factor, as suggested by Byrne (2001).

Table 1
Goodness of fit indexes for the two confirmatory analyses performed for each game

	Bisquerra						Biopsychological					
	Gl	χ^2	AIC	RMSEA	CFI	IFI	Gl	χ^2	AIC	RMSEA	CFI	IFI
TIC	52	115.04***	11.40	.058 (.04~.07)	.915	.918	2	5.44**	1.44	.069(.00~.14)	.962	.965
SAC	55	108.65***	-1.35	.052 (.04~.07)	.933	.935	3	5.16**	-.84	.045(.00~.11)	.983	.984
MIO	59	118.05***	.05	.053 (.04~.07)	.925	.927	2	4.46**	.46	.058(.00~.13)	.963	.967
CIE	58	148.18***	32.12	.065 (.05~.08)	.882	.885	2	5.44**	1.44	.069(.00~.14)	.962	.965
SAP	56	105.05***	-6.95	.049 (.03~.06)	.943	.945	3	5.37**	-.64	.047(.00~.11)	.982	.983
PGA	56	124.10***	12.10	.058 (.04~.07)	.920	.922	3	3.38**	-2.62	.019(.00~.09)	.998	.998
COM	53	86.97***	-19.03	.042 (.03~.06)	.954	.956	4	8.16**	.16	.053(.00~.11)	.950	.953
LIC	54	77.09***	-3.91	.034 (.01~.05)	.963	.965	4	2.81**	-5.19	.001(.00~.07)	1.0000	1.0000
PUL	58	119.08***	3.08	.054 (.04~.07)	.926	.928	4	2.74**	-5.26	.001(.00~.07)	1.0000	1.0000
BLA	55	106.91***	-3.09	.051 (.04~.07)	.932	.934	3	4.62**	-1.38	.039(.00~.10)	.983	.984
PER	54	111.36***	3.36	.054 (.04~.07)	.929	.931	3	5.28**	-.72	.046(.00~.11)	.974	.976
TOC	56	133.20***	21.20	.062 (.05~.08)	.906	.909	1	1.27**	-.73	.027(.00~.15)	.998	.998
PAS	56	117.88***	5.88	.055 (.04~.07)	.938	.939	4	6.31**	-1.69	.040(.00~.10)	.986	.987
BAQ	52	115.27***	11.27	.058 (.04~.07)	.928	.930	4	9.38**	1.38	.061(.00~.11)	.962	.964
PCZ	55	82.81***	-27.186	.037 (.02~.05)	.965	.966	3	8.42**	2.42	.071(.00~.13)	.945	.948
PEL	55	103.86***	-6.136	.049 (.04~.06)	.935	.937	2	12.65**	8.65	.121(.06~.19)	.901	.908

*Note. TIC = Throw, contact and win; SAC = Shoot race: MIO = Short-sighted circuit: CIE = Blind race: SAP : Jumping together: PGA = Pass and win; COM = Jumping rope; LIC = Birthday Líne; PUL = Pulse; BLA White or black; PER = It imitating chase; TOC = It touching game; PAS = 10 Ball passes; BAQ = Dodgeball; PCZ = Hunter ball; PEL = Sitting ball * .05; ** < .01; *** < .001*

The goodness of fit of the final readjusted models is shown in Table 1. According to the assessment criteria adopted, the Biopsychological model was adjusted to the data in 14 different games, while the Bisquerra model was not adjusted in any case. The absolute adjustment was better in the Biopsychological model than in the Bisquerra model except in one game (hunter ball). The absolute adjustment level was thus good for the Biopsychological model, whilst it was acceptable for the Bisquerra model. In relation to the parsimony index, in half of the cases the AIC value was lower for the Bisquerra model, or for the Biopsychological model. In general, the Biopsychological model would explain a better structure of the GES than the Bisquerra model.

The factorial saturations were homogeneous for all the games in the Biopsychological model. Since the positive emotions factor was only formed by one emotion, the saturation was consistently 1. In relation to the negative emotions (E^-), the median of the saturations (MdnSat) of sadness to factor E- was 0.73 (maximum value = 1.00 – minimum value = 0.49). The MdnSat of anger to factor E- was .58 (maximum value = .28 – minimum value = .82). MdnSat of rejection to factor E-was .59 (maximum value =

.96 – minimum value = .43). Finally, the MdnSat of fear to factor E- was .31 (maximum value = .01 – minimum value = .49). The distribution of the fear emotion was very asymmetrically positive in all the games. This could be because practicing sporting games hardly activates this emotion.

The analysis was carried out for each game, domain (psychomotor, cooperation, opposition and cooperation-opposition) and result (with competition and without competition). Given that the previous analysis concluded that the Biopsychological model was better, this model was applied in the 8 analyses which arise from the combination of domain per game. As with the previous CFAs, covariations between errors of the same factor were permitted. The Biopsychological model presented a good adjustment in accordance with the criteria established, except for opposition without competition (see Table 2).

Table 2
Goodness of fit indexes for the Biopsychological model for each domain and in accordance with the type of result.

Domain	Result	Biopsychological					
		SATORRA	df	sig	CFI	IFI	RMSEA/IC90%
Psychomotor	With Competition	43.41	21.00	.0028	.928	.933	.054(.031~.077)
Psychomotor	Without Competition	21.68	21.00	.4184	.998	.998	.009(<.001~.046)
Cooperation	With Competition	23.34	23.00	.4410	.999	.999	.06(<.001~.044)
Cooperation	Without Competition	38.29	25.00	.0433	.947	.951	.038(.007~.061)
Opposition	With Competition	36.72	24.00	.0467	.968	.970	.038(.005~.062)
Opposition	Without Competition	64.77	23.00	<.0001	.756	.772	.096(.077~.115)
Cooperation-Opposition	With Competition	29.30	21.00	.1070	.982	.983	.033(<.001~.059)
Cooperation-Opposition	Without Competition	37.03	21.00	.0167	.956	.959	.046(.019~.070)

Convergent and discriminant validity

To assess the convergent and discriminant validity of both models, the correlations between the factors of the 2 models of the GES were calculated with the dimensions of the PANAS and POMS questionnaires in two subsamples of 137 and 203 participants, respectively (see Table 3).

The negative affect of the PANAS correlated significantly and positively with the negative emotions factors of both models of the GES. The correlations with the positive emotions factors of the GES were non-significant. The positive affect of the PANAS correlated significantly and positively with the positive emotions factors of both models of the GES, while non-significant correlations were found in the majority of game domains with both models of the GES (see Table 3). Only in the cooperative games domain was there a positive correlation between the positive affect of the PANAS and the negative emotions of the Bisquerra model (r (136) = .22, $p < .01$), and with the negative emotions of the Biopsychological model (r (136) = .19, $p < .05$).

In order to verify whether there were differences in the magnitude of the significant correlations between the factors of the GES of both models and the subscales of the PANAS, Williams t-tests were performed. There were no significant differences (t (136) = between 1.51, p = .25 and -.25, p = .81) and therefore the pattern of relations found can be considered as equivalent between the two models. Only one of the comparisons between the magnitudes of the correlations was significant (t (137) = 2.07, $p < .05$). Thus, for the domain of cooperation-opposition games, the correlations found between the negative affect and the negative emotions factor of the Bisquerra model (r (137) = 0.54, $p < .01$) was significantly greater than with the Biopsychological model (r (137) = 0.49, $p < .01$). Finally, in relation to the ambiguous emotions factor of the Bisquerra model, significant correlations were found with the positive and negative affects. However, their magnitude was consistently greater for the positive (r between .35 and .44) than for the negative (r between .22 and .24) affect.

Table 3

Correlations between the factors extracted from the Bisquerra model and from the Biopsychological model of the GES with the factors of the PANAS and POMS scales

		Bisquerra Model												Biopsychological Model							
		Positive Emotions				Negative Emotions				Ambiguous Emotions				Positive Emotions				Negative Emotions			
		Psic	Opo	C-O	Coo	Psic	Opo	C-O	Coo	Psic	Opo	C-O	Coo	Psic	Opo	C-O	Coo	Psic	Opo	Coo	Coo
PANAS	Positive affect	.55	.45	.45	.36	.09	.01	.10	.22	.42	.35	.44	.41	.52	.44	.46	.32	.04	-.06	.09	.19
	Negative affect	.03	-.10	0.10	.11	.56	.53	.43	.54	.23	.13	.22	.23	.01	-.10	.10	.05	.56	.54	.39	.49
POMS	Vigor-Activity	.53	.47	.46	.45	.01	.02	.03	-.03	.37	.41	.30	.42	.53	.46	.42	.40	-.03	-.06	.01	-.05
	Tension-Anxiety	.19	.05	.04	-.05	.29	.44	.33	.25	.25	.15	.17	.17	.14	-.01	.04	-.07	.25	.40	.29	.19
	Depression-Despondency	-.18	-.15	-.12	-.04	.36	.60	.49	.41	.03	.04	.06	.14	-.20	-.22	-.11	-.07	.43	.65	.49	.41
	Anger-Hostility	-.02	-.01	-.04	.06	.43	.58	.55	.47	.15	.17	.17	.29	-.06	-.07	-.08	.01	.47	.60	.58	.46
	Fatigue-Immobility	-.28	-.05	-.02	-.03	.31	.42	.24	.37	-.06	.15	.09	.12	-.30	-.09	-.05	-.06	.36	.46	.23	.37

Note. Psic = Psychomotor Game; Opo = Opposition Game; C-O = Cooperation-Opposition Game; Coo = Cooperation Game. The correlations in bold are all significant.
Significance of the correlations with the PANAS instrument (n = 137): 12 < r < 22, p < .05; 22 < r < 24, p < .01; r ≥ 24, p < .001. Significance of the correlations with the POMS instrument (n = 203): 14 < r < 19, p < .05; 19 < r < 24, p < .01; r ≥ 24, p < .00

The results found with the POMS test were in line with that found in the PANAS test. The positive emotions factors of the GES correlated significantly ($p < .01$) with the Vigor-Activity factor of the POMS (Bisquerra model: r between .45 and .53; Biopsychological model: r between .40 and .53). The comparison of the magnitudes of the correlations of the two models using the Williams t-test was non-significant for all the domains (t (203) = between 1.45, p = .14 and .26, p =.80). In relation to the discriminant validity, in the majority of cases the correlations between the positive emotions factors of the GES with the 4 subscales of negative emotional states of the POMS were non-significant or negative, as would be expected (Crocker, 1997; Norcross, Guadagnoli and Prochaska, 1984). The only unexpected correlation was found with the Tension-Anxiety factor in the psychomotor domain. In this case, the correlation with the positive emotions factor of the Biopsychological model (r (136) = .14, p < .05) was lower with the positive emotions factor of the Bisquerra model (r (202) = .19, p < .01).

In relation to the other 4 scales associated with negative emotional states of the POMS (Table 3), the correlations with the two negative emotions factors were also significant (Bisquerra model: r between .25 and .60; Biopsychological model: r between .19 and .65). The comparison using the Williams t-test between the two models showed 5 significant results. On three occasions, the correlations found with the Biopsychological model were greater than those found with the Bisquerra model (Depression-Despondency in the psychomotor domain: t (202) = -2.69, p < .01; Depression-Despondency in the opposition domain: t (202) = -3.07, p < .01; Anger-Hostility in the cooperation domain: t (202) = -2.00, p < .05). In the other two, the correlations were greater for the Bisquerra model than for the Biopsychological model (Tension-Anxiety in the cooperation domain: t (202) = 2.12, p <.05; Tension-Anxiety in the cooperation-opposition domain: t (202) = 2.95, p <.01). The discriminant validity of the negative emotions factors in relation to the POMS was adequate, since no significant correlation was found with the Vigor-Activity scale (see Table 3).

In relation to the ambiguous emotions factor of the Bisquerra model, significant correlations were found (p < .01) for all the domains with the Vigor-Activity scale of the POMS (r between .30 and .42). However, some correlations were significant with the scales which assess negative affective states of the POMS while others were not (Table 3).

To summarize, the pattern of relations found between the two models and the PANAS and POMS tests showed scarce differences. Both models recorded an adequate level of convergent validity for the positive and negative emotions factors. Although the results are similar in relation to discriminant validity, it appears that the pattern of results of the Biopsychological model is more adequate than the Bisquerra model. Along these lines, the ambiguous emotions of the Bisquerra model presented a less congruent and less consistent pattern of relations.

Discussion

The main aim of this research was to compare the Bisquerra's model (2000) of 13 emotions based on Lazarus (1991) with the Biopsychological model of five basic emotions (Tracy and Randles, 2011). The participants of the study performed several motor experiences. After them, they reported their emotional intensity in a 1-7 Likert scale, instead of the previous one (0-10 Likert scale). Hence, the two models (the Bisquerra model and the Biopsychological model) were compared according to absolute and parsimony fit indexes.

The confirmatory factor analysis methodology reflects the fact that the Biopsychological model shows a better absolute adjustment to the data than the Bisquerra model (2000). In relation to the parsimony indexes, in some games the Bisquerra model is better adjusted (psychomotor games: SAC =Shoot race, MIO = Short-sighted circuit; cooperation games: SAP = Jumping together SAP, COM = Jumping rope; opposition games: BLA = White or black; cooperation-opposition games: PCZ = Hunter ball, and PEL = Sitting ball), although in others the Biopsychological model appears to be more adequate (Psychomotor games: TIC =Throw, contact and win, CIE = Blind race; Cooperation games: PGA = Pass and win, LIC = Birthday Line; Opposition games: PUL = Pulse; PER = It imitating chase; TOC = It touching game; Cooperation-Opposition games: PASS = 10 ball passes and BAQ = Dodgeball). Considering all the adjustment indexes overall, the 5 basic emotions of the Biopsychological model explain the structure of the emotions underlying the GES better than the Bisquerra model. Finally, on grouping the games by type of domain and result, the Biopsychological model is adequately adjusted in the majority of cases.

To assess the convergent validity, the different factors extracted with the GES models were correlated with the scores obtained by each participant on the PANAS and POMS scales. The pattern of correlations of the Biopsychological model is more homogeneous and adequate than the Bisquerra model. The majority of correlations are similar in both models. There are seldom significant differences between the two models, the correlations being greater with PANAS and POMS in some cases for the Bisquerra model and in others for the Biopsychological model. The main problem with the Bisquerra model is observed in the ambiguous emotions, more associated with the scales of positive emotional states of PANAS and POMS than with the negative scales, along the lines of that observed in other studies (e.g. Duran et al, 2014; Lavega, Alonso et al, 2014; Lavega et al., 2013).

According to the construct and convergent validity tests, the Biopsychological model better explains the emotional activation after carrying out any kind of game. The basic emotions would be joy as a positive emotion and a factor of negative emotions characterized by sadness, anger, fear and rejection (disgust), along the lines of the theoretical justifications proposed by the Biopsychological model (Tracy and Randles, 2011).

In conclusion, although the general results appear to indicate that the structure of two main factors of basic emotions (Biopsychological model) is better than the structure of three factors proposed by Bisquerra, the parsimony indexes indicate that the latter can also be valid in some cases. Therefore, according to this research, if the GES is used it would be recommended to analyze the data using the Biopsychological model of basic emotions although, in certain games, the more complex structure of the Bisquerra model could also be adequate (in psychomotor games: SAC = Sack race, MIO = Short-sighted circuit; cooperation games: SAP = Jumping together, COM = Jumping rope; opposition games: BLA = White or black; cooperation-opposition games: PCZ = Hunter ball, and PEL = Sitting ball).

This is important for future research in which it is intended to compare, for example, whether one type of game activates more negative emotions than another and to make comparisons in accordance with variables such as gender or competition, as performed in other research (e.g. Duran et al., 2014; Lavega, Lagardera et al 2014).

One limitation of this study is that the sample was composed of physical education university students. It would be convenient to perform this experiment with non-university students or students from other specialties in order to ratify these findings. In addition, the present study could be performed also using the 0-10 Likert scale proposed by Bisquerra and Pérez-Escoda (2015) and taking into account other references as Bisquerra (2009, 2015) as well as Bisquerra and Laymuns (2016). Replicating in this scenario that the best fitting model would be the Biopsychological one, should confirm that the results found at the present study were not spurious.

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Validación de la escala de juegos y emociones (GES-II) para el estudio de experiencias motoras emocionales

Resumen

Cualquier profesor o entrenador debería disponer de un instrumento para estudiar las experiencias emocionales que suscita la práctica de un juego o deporte. El objetivo de este estudio fue comparar el comportamiento de las emociones básicas en distintos juegos, según el modelo de Bisquerra (MBI) y el modelo biopsicológico (MBPS) consensuado internacionalmente, a través del cuestionario validado Emotions and Games Scale (GES). Se estudió a 502 estudiantes universitarios, que tras participar en juegos de distintas categorías respondieron los cuestionarios GES, PANAS y POMS. El MBPS tuvo mejor ajuste en los índices de ajuste absoluto, análisis factorial confirmatorio, índices de parsimonia, pruebas de validez de constructo y convergente. Los resultados sugieren utilizar el GES con los dos factores y cinco emociones básicas que identifica el MBPS: emoción positiva (alegría), emoción negativa (ira, miedo, tristeza y rechazo)

Palabras clave: Análisis factorial, cuestionario, emociones básicas, juego, conciencia emocional

Validação da escala de jogos e emoções (GES-II) para o estudio de experiências motoras emocionales

Resumo

Qualquer professor ou treinador deveria dispor de um instrumento para estudar as experiências emocionais que suscita a prática de um jogo ou esporte. O objetivo desse estudo foi comparar o comportamento das emoções básicas em diferentes jogos, segundo o modelo de Bisquerra (MBI) e o modelo biopsicológico (MBPS) acordado internacionalmente, através do questionário validado Emotions and Games Scale (GES). Participaram do estudo 502 estudantes universitários, que após praticar jogos de diferentes categorias responderam os questionários GES, PANAS e POMS. O MBPS teve melhor ajuste nos índices de ajuste absoluto, análise fatorial confirmativo, índices de parcimônia, provas de validez de constructo e convergente. Os resultados sugerem utilizar o GES com os dois fatores e cinco emoções básicas que identifica o MBPS: emoção positiva (alegria), emoção negativa (ira, medo, tristeza e rejeição).

Palavras chave: Análise fatorial, questionário, emoções básicas, jogo, consciência emocional

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