Psychometric properties of the Spanish Jackson-5 scales of the revised Reinforcement Sensitivity Theory of Personality

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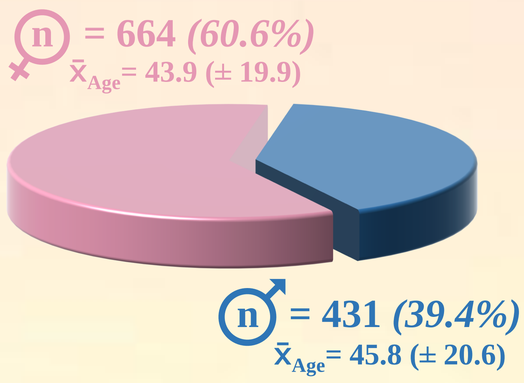
Introduction The revised Reinforcement Sensitivity Theory of Personality (rRST; Gray & McNaughton, 2000) postulates three major neuropsychological motivational systems underlying individual differences in reaction to aversive, appetitive, or conflicting stimuli, respectively: The **Fight-Flight-Freeze System** (FFFS, related to fear and defensive responses), the **Behavioral Approach System** (BAS, related to pleasure and approach responses), and the **Behavioral Inhibition System** (BIS, related to anxiety and cautious approach). The Jackson-5 (J5; Jackson, 2009) was the first attempt to develop new scales to measure rRST. In addition to the BIS and the BAS, the J5 was developed with the purpose of separately evaluating each of the three FFFS subsystems. That is why the J5 is composed of 30 items, equally distributed across five scales: **BAS**, **BIS**, Fight (**FI**), Flight (**FL**), and Freeze (**FR**). The answer format is a 5-point Likert-type scale *(1 = completely disagree; 5 = completely agree)*.

Objectives Analyze the psychometric properties of the Spanish J5 through the Factorial Analysis of items (Ferrando et al., 2022).

Methods *Participants:* **N = 1,095 volunteers of the community** (60.6% women) between 17-87 years (M = 44.7, SD = 20.2).



Marital status		Educational level	
Single	33.0%	Primary	16.4%
Married	52.5%	Secondary	49.6%
Divorced	8.0%	University	24.5%
Widower	6.5%	Postgrad.	9.5%

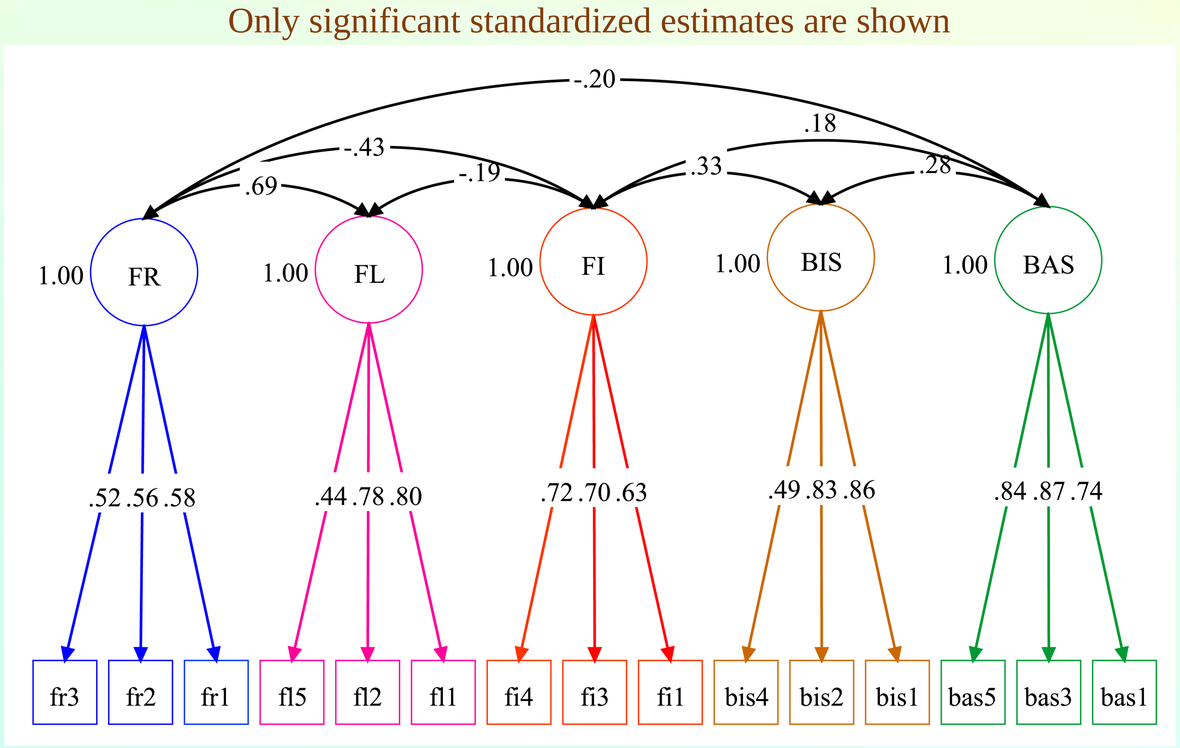
Employment status: 60% active

Psychometric Analysis: Confirmatory Factor Analysis (CFA) of several models of the J5 scales using a mean and variance adjusted weighted lead squares estimation (WLSMV) of the sample covariance matrix.

Results The Five-Factor Model of complete Spanish J5-30 items has a poor goodness of fit (χ^2 (395, N= 1,095)= 1065.969, $p < .001$; CFI: .85; RMSEA= .068). The first model of the Spanish J5 with an acceptable fit is configured by 4-Factors (BAS, BIS, FI, and FL-FR) with five items each (χ^2 (164, N= 1,095) = 1065,969 $p < .001$; **CFI: .92**; RMSEA: .071 [.067, .075] 90% CI), in which the FI scale correlates negatively with FL-FR (r= - .22). The best-fitted Five-Factor Model of the Spanish J5 is configured by three items each (see Figure).

Single CFA 5-Factor Model of the Spanish J5

Only significant standardized estimates are shown



χ^2 (80, N = 1,095) = 300.864, $p < .001$; **CFI: .98**; RMSEA: .050 [.044, .056] 90% CI
The model has a good fit, and all the items show a robust load on their respective scale.

The Spanish J5 reproduces the five factors of the original Jackson-5 scales with half the items. However, the second-order FFFS factor that should integrate the FI, FL, and FR subsystems does not converge, since although FR and FL correlate positively and significantly with each other, both correlate negatively with FI. Jackson's (2009) study highlights exactly this finding, arguing that FI is likely to be a problematical primary scale of FFFS because it represents a *proximal* fear response to a very threatening stimulus, while FL and FR are both responses to *distal* punishing stimuli. This result is also consistent with the study by Krupic et al. (2016) in which different RST scales are analyzed. On the other hand, the FI is positively correlated with both the BIS and the BAS. The FI-BIS correlation is, *a priori*, theoretically inconsistent with rRST. However, for Jackson (2009) the BIS is associated with competition and social conflict resolution, which could justify its relationship with the combative attitude of the FI. The marginal relationship between FI and BAS should not be surprising given that fight and aggression (both reactive and proactive) are related to BAS (cited by Krupic et al., 2016). Furthermore, BIS and BAS are positively correlated, which is consistent with the consideration of BIS as a defensive *approach* system (Jackson, 2009; Harnett et al., 2013).

Descriptive statistics, Internal consistency, and Sex Differences for Facets and Motivational Systems in the revised Spanish J5 (15 items)

Spanish J5		Total sample (N = 1,095)				Males (n = 431)				Females (n = 664)				Sex differences			
Scales	Items	*M*	*SD*	α	r_{ii}	*M*	*SD*	α	r_{ii}	*M*	*SD*	α	r_{ii}	$t_{(1093)}$	*p*	*g*	CI (95%) *
BAS	3	9.93	2.72	.82	.60	9.90	2.64	.82	.60	9.95	2.78	.82	.60	- .342	.732	–	–
BIS	3	10.09	2.51	.72	.46	10.63	2.47	.77	.53	9.75	2.47	.67	.41	5.773	< .001	0.36	[0.23, 0.48]
FFFS	9	28.71	4.68	.48	.09	26.96	4.38	.49	.10	29.85	4.52	.48	.09	- 10.474	< .001	- 0.65	[- 0.77, - 0.52]
FFFS-FI	3	10.19	2.66	.68	.41	10.99	2.54	.70	.44	9.67	2.60	.64	.37	8.253	< .001	0.51	[0.39, 0.64]
FFFS-FL	3	10.19	2.78	.67	.40	8.65	2.58	.66	.40	11.18	2.43	.55	.29	- 16.373	< .001	- 1.02	[-1.14, - 0.89]
FFFS-FR	3	8.34	2.55	.54	.28	7.32	2.43	.58	.32	9.00	2.40	.42	.20	- 11.301	< .001	- 0.70	[- 0.82, - 0.57]

Note. M: Mean. *SD:* Standard Deviation. *α:* Cronbach's α. r_{ii}: Inter-item average correlation. *t:* Student's t-test. *g:* Hedges' *g* effect size. * CI: Confidence Interval (95%) for Hedges' *g*.

These estimates suggest that, except for the FR scale, the items of the Spanish J5 scales are very homogeneous, avoiding unnecessary redundancy. Women scored significantly higher than men in FL (large effect size) and FR (medium-large effect size), while men scored significantly higher than women in FI (medium effect size) and BIS (small effect size). All these sex differences replicate those of the original Jackson-5, except for the BIS.

Conclusions The Spanish J5 reproduces the five factors of the original Jackson-5 with half the items. All the Spanish J5 scales have reasonable internal consistency, except for the FR scale. Moreover, the FI scale presents difficulties to be integrated into the FFFS, as proposed by the rRST.

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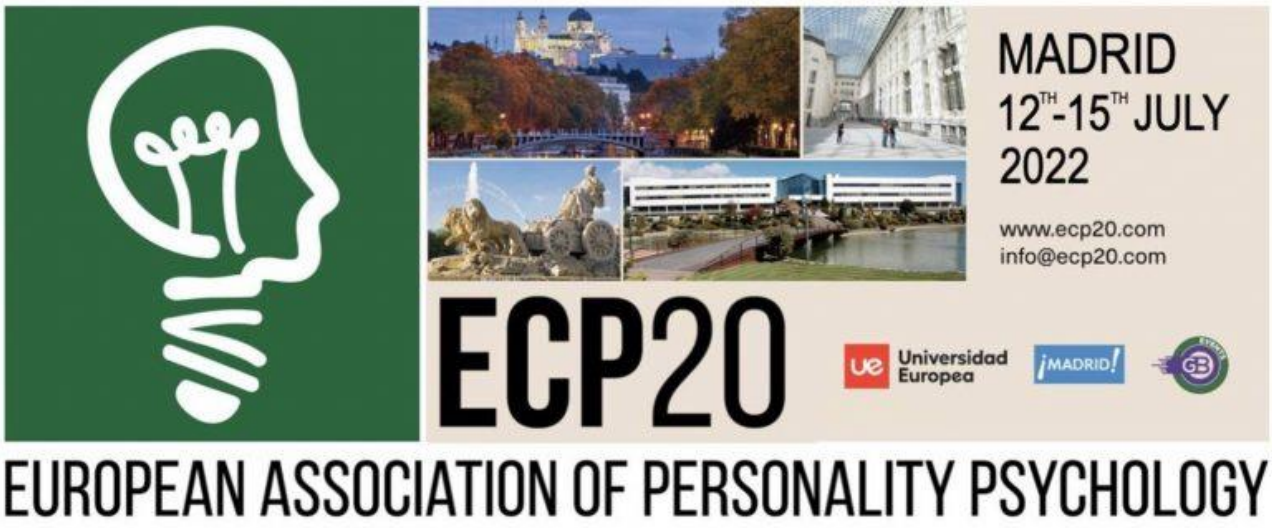

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