

## Relationship between Frustration Intolerance and Personality Dimensions

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### ABSTRACT

Frustration is a negative state triggered by unexpected reward loss with behavioral, emotional and motivational components. Frustration Intolerance (FI) has been considered a vulnerability marker for psychopathology, its impact being modulated by personality dimensions. In this study, the relationship between FI and personality dimensions was analyzed in 640 undergraduate students. The reduced version of the Revised NEO Personality Inventory and the Sensitivity to Punishment and Sensitivity to Reward Questionnaire assessed personality dimensions. The Investigative Scale of Tolerance to Frustration, the Frustration Discomfort Scale, and the Frustrative Nonreward Responsiveness Scale assessed the behavioral, emotional and motivational components of FI, respectively. Descriptive, reliability, Pearson and partial correlation analyses were conducted. Regardless of the frustration component assessed, FI consistently and positively correlated with Neuroticism, Sensitivity to Punishment and Sensitivity to Reward. The relationship between FI and other personality dimensions seemed to be dependent on the particular FI assessment instrument used and on the corresponding component involved: Behavioral FI correlated positively with Extraversion and negatively with Openness and Agreeableness, whereas the relationship between these personality dimensions and emotional and motivational FI was not so clear. Therefore, a systematic analysis of the components of FI seems to be necessary to understand its relationship with personality.

*Keywords:* personality, frustration intolerance, neuroticism, sensitivity to punishment, sensitivity to reward.

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### Novelty and Significance

*What is already known about the topic?*

- Frustration is a negative state induced by unexpected and sudden reward loss.
- Individual differences in frustration intolerance are considered a vulnerability marker for psychopathology.
- The relationship between frustration intolerance and personality is inconsistent because the components of frustration intolerance (behavioral, emotional and motivational) are usually assessed separately.

*What this paper adds?*

- The study identified the specific relationships between the behavioral, emotional and motivational components of frustration intolerance and personality dimensions.
- A systematic analysis of the components of frustration intolerance is necessary to understand how personality relates to differential profiles of coping with resource loss and failure.

Frustration is defined as a negative state induced by the unexpected and sudden omission, reduction in magnitude, quality degradation or inaccessibility to appetitive reinforcers (Amsel, 1992), being associated with emotional distress, aggression and low motivation (Berkowitz, 1989; Harrington, 2007; Wright, Lam, & Brown, 2009). Individual differences in frustration intolerance (FI) have been involved in vulnerability

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to psychopathology, academic achievement, cognitive control, and coping strategies, among others (Chand, 2015; Filippello, Harrington, Buzzai, Sorrenti, & Costa, 2014; Gatzke-Kopp, Willner, Jetha, Abenavoli, DuPuis, & Segalowitz, 2015; Harrington, 2006; Jeronimus, Riese, Oldehinkel, & Ormel, 2017; Jibeen, 2013; Ramírez Castillo, García Roda, Güell, Fernández Montalvo, Bernacer, & Morón, 2019; Scime & Norvilitis, 2006; Seymour, Rosch, Tiedemann, & Mostofsky, 2020). These differences may be dependent on personality traits, defined as dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings and actions (Costa & McCrae, 1980). However, the research on the connection between FI and personality dimensions is sparse and the results inconsistent (Hadlington & Scase, 2018). The present study will focus on the relationship between FI and personality dimensions as included in the Five-Factor Model of personality (FFM; Costa & McCrae, 1980), and the reinforcement sensitivity theory (RST; Gray, 1981, 1982).

The FFM of personality constitutes a hierarchical organization of personality traits in terms of five basic dimensions: Neuroticism (or Emotional stability, representing individual differences in the tendency to experience distress); Extraversion (or Surgency, describing energetic and thrill-seeking vs. sober and solitary individuals); Agreeableness (ranging from friendly compliance vs. hostile noncompliance); Conscientiousness (associated to will to achieve, diligence and thoroughness); and Openness (representing individuals with high curiosity and unconventional interests vs. traditional and pragmatic individuals). Research using self-reports and ratings, natural language adjectives and personality questionnaires show the comprehensiveness of the model and its applicability across observers, cultures, and populations (Costa & McCrae, 1980; McCrae & John, 1992). A number of studies reported significant positive associations between FI and Neuroticism (Gray & Nicholson, 1974; Nicholson & Gray, 1972; Zajenkowska, Zajenkowski, & Jankowski, 2015). Moreover, sensitivity to frustration of basic needs negatively correlates with Extraversion, Conscientiousness, Openness and Agreeableness (Nishimura & Suzuki, 2016). Agreeableness, Conscientiousness, and Openness have also been shown to serve as significant negative predictors for frustration in digital technology, whereas Extraversion and Neuroticism acted as significant positive predictors (Hadlington & Scase, 2018), thus showing a complex relationship between Extraversion and FI.

The RST is built upon state descriptions of neural systems, emotions and behaviors, which, according to the theory, give rise to longer-term trait dispositions (Pickering & Corr, 2008). In its original formulation, Gray (1981, 1982) suggested the existence of two motivational systems responsible for personality dimensions. The Behavioral Inhibition System (BIS, sensitive to signals of punishment, frustrative non-reward and novelty) was associated with the personality dimension of anxiety. Individual differences in the Behavioral Approach System (BAS, reactive to positive conditioned stimuli or relief signals of non-punishment) corresponded to the personality dimension of impulsivity. In a more recent version of the RST, the BIS was proposed to be specialized in conflict solving, whereas a Fight-Flight-Freeze System (similar in many aspects to the original BIS) would react to all types of punishment (Gray & McNaughton, 2000). A number of studies have found significant positive associations between sensitivity to nonreward (a construct derived from Gray's theory closely related to FI) and the motivational systems and personality dimensions of the original RST, including anxiety/sensitivity to punishment/BIS (Gray, 1981; Wright *et alia*, 2009), impulsivity/sensitivity to reward/BAS (Carver, 2004), and both (Corr, 2001). Therefore, whether FI depends on motivational systems tied to negative affect (BIS), positive affect (BAS) or both, remains unclear.

The complex relationship between FI and personality dimensions could rely on differences in the way FI is conceptualized and assessed. Behavioral reactions to nonreward (e.g. aggression) have been considered as crucial in some traditional studies on state and trait frustration (Berkowitz, 1962; Rosenzweig, 1938). Alternatively, FI sometimes refers to the internal/emotional distress derived from the refusal to accept the difference between desire and reality (Harrington, 2006, 2007). Lowered approach motivation (e.g. poor effortful pursuit of goals) has also been used to assess individual differences in response to nonreward (Carver, 2004; Wright *et alia*, 2009). In which extent these behavioral, emotional and motivational components of FI differentially relate with particular personality dimensions deserve further investigation.

The main aim of the present study was to analyze the relationship between the components of FI and dimensions of personality included in the FFM and the RST. Based on the scientific evidence reviewed above, positive correlations between FI and personality dimensions related with negative affect were predicted, these personality dimensions corresponding to Neuroticism (FFM) and Sensitivity to Punishment (RST). Some personality dimensions of the FFM associated with positive affect (Openness, Agreeableness and Conscientiousness; see Yik & Russell, 2001) were expected to show negative correlations with FI measures, whereas the relationship between Extraversion (FFM) and Sensitivity to Reward (RST) and FI cannot be precisely predicted according to the inconsistencies reported in the literature. We also aimed at identifying whether the behavioral, emotional and motivational components of FI differentially relate with personality dimensions.

## METHOD

### *Participants*

Participants were 640 undergraduates (530 females, mean age= 20.96,  $SD= 4$ ). The study was approved by the Human Research Ethics Committee of the University of Jaén.

### *Instruments*

*Investigative Scale of Tolerance to Frustration (ISTF; Ramírez Castillo, 2017)*. This instrument was based on the Picture Frustration Test developed by Rosenzweig (1945) to analyze aggressive reactions in response to frustrating situations presented in vignettes where pairs of characters interacted. Ramírez Castillo (2017) developed a language-based version of the original test and included 20 items describing particular frustrating situations and a five-point Likert scale for collecting the subject's behavioral reaction to the situation. The scale includes five sub-dimensions or factors: (1) Uncontrollable external cause; (2) Friendship betrayal; (3) Forced expectancy change; (4) Job disappointment; and (5) Public humiliation. Sub-dimension scores and total scores were reversed so that a high score would describe someone who tends to become intolerant in response to frustration. Internal consistency, stability across test-retest, and validity analyses have shown the adequate psychometric properties of the Scale (Ramírez Castillo, 2017).

*Frustration Discomfort Scale (FDS; Harrington, 2005; Spanish version Lubroth, 2015)*. This Scale consists of 28 statements with four sub-scales: Discomfort intolerance, Emotional intolerance, Entitlement and Achievement. Respondents estimate with a five-point anchor Likert-type scale the strength to which they believe that will experience internal/emotional distress when confronting nonreward, goal obstruction or excessive effort, among others. The original FDS version has shown good evidence of internal consistency as measured by Cronbach's  $\alpha$  for the respective sub-scales (Harrington, 2005).

*Frustrative Nonreward Responsiveness Scale* (FNR; Wright *et alia*, 2009). This Scale consists of five items written to assess approach motivation following nonreward. A four-point fully anchored Likert scale collects answers so that high scores would describe someone who tends to become very demotivated in response to nonreward. Reliability and validity of the scale have been found to be adequate (Wright *et alia*, 2009). A Spanish translation of this Scale was used for the present study.

*Reduced version of the Revised NEO Personality Inventory* (NEO-FFI; Costa & McCrae, 1992; Spanish adaptation Cordero, Pamos, & Seisdedos, 1999). The Inventory consists of 60 items that examines five personality domains (Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism). The instrument includes self-descriptive statements that participants respond by using a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Scale has shown validity and utility in a number of different contexts and cultures (McCrae & Costa, 2004), the Spanish version showing high consistency coefficients and test-retest values (see Cordero *et alia*, 1999).

*Sensitivity to Punishment and Sensitivity to Reward Questionnaire* (SPSRQ; Torrubia, Ávila, Moltó, & Caseras, 2001). This questionnaire was developed to assess personality dimensions according to the original RST (Gray, 1981, 1982). It is aimed to measure individual differences in the BIS by means of the Sensitivity to Punishment Scale, and in the BAS by means of the Sensitivity to Reward Scale. Each Scale is composed by 24 items with a yes/no response format. Psychometric studies have shown satisfactory internal consistency, test-retest reliability, and convergent and discriminant validity for both Scales (see Torrubia *et alia*, 2001, for details).

### *Procedure*

An authorization was requested to the professor of the corresponding course before contacting students enrolled in the Degrees of Psychology, Early Childhood Education and Laws. The researcher first explained the purpose of the study and assured confidentiality for their responses. Assessment instruments and participants' informed consent were collectively fulfilled in their regular classrooms in a single session.

### *Data Analysis*

Data from the completed questionnaires were entered into an SPSS database for statistical analysis. Descriptive statistics, reliability, Pearson and partial correlations were computed with an alpha level of .05, corrected with the Bonferroni multiple-comparison correction ( $p < .0042$ ).

## **RESULTS**

Table 1 shows the means, standard deviations and reliability of the personality dimensions and FI components assessed in the present study. The mean scores were similar to that reported in previous studies (e.g. Filippello *et alia*, 2014; Harrington, 2005; McCrae & Costa, 2004; Stanković, Matić, Vukosavljević-Gvozden, & Opačić, 2015; Torrubia *et alia*, 2001). High reliability values were also obtained, ranging from 0.49 (Friendship betrayal in the ISTF Scale) to 0.86 (Extraversion in the NEO-FFI).

Table 2 shows the relationship between NEO-FFI personality dimensions and FI Scales and Sub-scales. Total ISTF positively correlated with Neuroticism, and negatively with Openness, Agreeableness, and Conscientiousness, with partial correlations confirming these results (except for Conscientiousness) and adding significant positive correlations with Extraversion. A similar pattern of correlations was obtained when FFM personality dimensions were correlated with the ISTF Sub-scales, especially with

Table 1. Means, standard deviations and reliability for the dimensions of FI and personality dimensions. (N= 640)

Dimensions		M	SD	Reliability (Cronbach $\alpha$ )
Frustration Intolerance	ISTF (Total)	62.13	9.40	0.80
	Uncontrollable external cause	17.63	3.40	0.50
	Friendship betrayal	13.18	2.45	0.49
	Forced expectancy change	8.91	2.72	0.54
	Job disappointment	11.92	1.88	0.53
	Public humiliation	10.50	2.60	0.51
	FDS (Total)	79.91	16.49	0.90
	Discomfort intolerance	18.11	4.49	0.72
	Entitlement	21.65	5.16	0.76
	Emotional intolerance	19.52	5.67	0.80
	Achievement	20.64	4.77	0.73
FNR		12.40	2.74	0.68
Personality	Neuroticism	23.43	8.62	0.85
	Extraversion	31.61	8.01	0.86
	NEO-FFI Openness	30.35	7.06	0.77
	Agreeableness	30.00	6.36	0.73
	Conscientiousness	30.51	7.28	0.83
	SPSRQ Sensitivity to reward	10.57	4.10	0.74
	SPSRQ Sensitivity to punishment	11.66	5.33	0.84

Notes: FNR= Frustrative Nonreward Responsiveness; FDS= Frustration Discomfort Scale; ISTF= Investigative Scale of Tolerance to Frustration; M= Mean; SD= Standard Deviation.

Table 2. Pearson and partial correlations between FI and personality dimensions of the NEO-FFI.

Dimensions	Neuroticism		Extraversion		Openness		Agreeableness		Conscientiousness	
	r	Partial	r	Partial	r	Partial	r	Partial	r	Partial
ISTF (Total)	.229*	.209*	-.018	.152*	-.172*	-.220*	-.261*	-.218*	-.147*	-.101
Uncontrollable external cause	.102	.089	.005	.107	-.153*	-.177*	-.195*	-.175*	-.077	-.056
Friendship betrayal	.197*	.205*	-.013	.115*	-.169*	-.199*	-.124*	-.085	-.061	-.031
Forced expectancy change	.165*	.133*	.000	.122*	-.078	-.120*	-.205*	-.163*	-.175*	-.138*
Job disappointment	.132*	.109	.051	.165*	-.048	-.090	-.245*	-.223*	-.151*	-.114*
Public humiliation	.239*	.208*	-.098	.038	-.147*	-.165*	-.180*	-.125*	-.083	-.024
FDS (Total)	.424*	.386*	-.149*	.037	-.051	-.076	-.213*	-.133*	-.098	.026
Discomfort intolerance	.317*	.211*	-.246*	-.087	-.133*	-.167*	-.191*	-.075	-.292*	-.226*
Entitlement	.286*	.244*	-.062	.112	-.082	-.117*	-.317*	-.267*	-.144*	-.057
Emotional intolerance	.531*	.504*	-.173*	.028	.005	-.025	-.114*	.005	-.106	.037
Achievement	.226*	.286*	-.010	.054	.032	.054	-.080	-.089	.217*	.304*
FNR	.467*	.376*	-.265*	-.056	-.089	-.149*	-.196*	-.047	-.346*	-.261*

Notes: r= Pearson correlation, partial correlations controlling the other four personality dimensions; \* = p value after Bonferroni correction (.004); FNR= Frustrative Nonreward Responsiveness; ISTF= Investigative Scale of Tolerance to Frustration; FDS= Frustration Discomfort Scale.

respect to Neuroticism (except for Uncontrollable external cause) and Agreeableness. Partial correlations confirmed most of these results, also showing that Friendship betrayal, Forced expectancy change and Job disappointment positively correlated with Extraversion.

Total FDS positively correlated with Neuroticism and negatively with Extraversion and Agreeableness; partial correlations supported the relationship with Neuroticism and Agreeableness, but not with Extraversion. FDS Sub-scales were also positively correlated with Neuroticism and negatively with Agreeableness (except for Achievement), with partial correlations supporting most of these relationships. Although total FDS did not exhibit any relationship with Openness and Conscientiousness, partial correlations involving Sub-scales showed significant negative correlations between Discomfort intolerance and Entitlement and Openness, and between Discomfort intolerance and Conscientiousness, whereas the relationship between Achievement and Conscientiousness was positive (see Table 2 for details).

Finally, FNR positively correlated with Neuroticism, and negatively with Extraversion, Agreeableness and Conscientiousness. Partial correlations confirmed the

correlations regarding Neuroticism and Conscientiousness, and extend the negative correlation to Openness.

Pearson and partial correlations involving SPSRQ and FI scores are presented in Table 3. Sensitivity to Punishment positively correlated with total ISTF, total and Sub-scales FDS scores, and FNR, whereas only the ISTF Sub-scales of Friendship betrayal and Public humiliation showed significant positive correlations with this Sub-scale of the SPSRQ. Conversely, Sensitivity to Reward exhibited significant positive correlations with total ISFT, total FDS and FNR, as well as with all of the sub-dimensions included in ISFT and FDS Scales.

Table 3. Pearson and partial correlations between FI and personality dimensions of the SPSRQ.

	SP		SR	
	<i>r</i>	Partial	<i>r</i>	Partial
ISTF (Total)	.117*	.144*	.310*	.320*
Uncontrollable external cause	.019	.036	.256*	.258*
Friendship betrayal	.168*	.183*	.179*	.192*
Forced expectancy change	.052	.070	.252*	.256*
Job disappointment	.012	.026	.213*	.214*
Public humiliation	.177*	.194*	.200*	.215*
FDS (Total)	.358*	.397*	.306*	.352*
Discomfort intolerance	.317*	.335*	.187*	.218*
Entitlement	.216*	.253*	.349*	.372*
Emotional intolerance	.428*	.452*	.211*	.263*
Achievement	.198*	.221*	.255*	.273*
FNR	.426*	.441*	.151*	.197*

Notes: *r*= Pearson correlation, partial correlations controlling the other four personality dimensions; \*=*p* value after Bonferroni correction (.004); SP= Sensitivity to Punishment; SR= Sensitivity to Reward.

## DISCUSSION

The present study examined the relationship between personality and FI in a sample of Spanish university undergraduate students, aiming at identifying whether the behavioral, emotional and motivational components of FI are differentially related with particular personality dimensions. Regardless of the prominent frustration component assessed, FI consistently and positively correlated with Neuroticism, Sensitivity to Punishment and Sensitivity to Reward. The relationship between FI and Openness seemed to be dependent on the particular instrument of assessment used and on the corresponding FI component involved. In particular, behavioral (ISTF) and motivational (FNR) components showed a more clearly negative correlation with this personality dimension than with the emotional/distress component (FDS; see Table 2). Results involving Extraversion were of particular relevance for the present study, as Pearson and partial correlations showed both negative and positive associations with FI that were dependent on the assessment instrument (positive for ISTF, and negative for FNR and FDS). These data partially confirm previous results and highlight the importance of more accurately analyze FI for a better understanding of its relationship with personality dimensions.

Previous studies have shown a significant role of personality dimensions of the FFM and individual differences in reactivity to nonreward. FI has been positively associated with Neuroticism (Abdel, 2017; Gray, 1970; Gray & Nicholson, 1974; McNaughton & Corr, 2018; Nicholson & Gray, 1972; Nishimura & Suzuki, 2016; Zajenkovska *et alia*, 2015), and negatively with Extraversion, Conscientiousness, Openness and Agreeableness (Hadlington & Scase, 2018; Nishimura & Suzuki, 2016), although Extraversion has also been shown to be a positive predictor of FI (Hadlington & Scase, 2018). Moreover,

parallels have been made between these personality dimensions and the factors included in the FDS Scale (Harrington, 2007): between Emotional intolerance and Neuroticism; Entitlement and Agreeableness; Discomfort intolerance and low Conscientiousness; and Achievement and high Conscientiousness. The fact that factors included in ISTF and FDS Scales (as well as FNR) correlated with a number of FFM personality dimensions (with the exception of Emotional intolerance) conversely suggest that behavioral, emotional and motivational differences in FI are dependent on more than one personality dimension. Interestingly, individuals more prone to react aggressively when confronting social situations involving nonreward (ISTF) showed higher scores in Extraversion, in accordance with the behavioral disinhibition and high sociability characterizing extraverts (Costa & McCrae, 1992). By contrast, participants with high emotional distress (FDS) and low motivation (FNR) in response to nonreward scored lower in Extraversion, though these results were not confirmed by partial correlations (see Table 2).

The original formulation of the RST (Gray, 1981, 1982) assumed that differences in personality were dependent on variations in Sensitivity to Punishment (BIS, anxiety) and to Reward (BAS, impulsivity). Although this theory initially associated sensitivity to conditioned nonreward with the BIS, Corr (2001) proposed that the BAS was also sensitive to signals of nonreward, based on its role in comparing expected with actual reinforcement. According with this view, sensitivity to nonreward would be thus dependent on the reactivity of both the BAS and the BIS (Corr, 2002). Wright *et alia* (2009) found evidence that sensitivity to reward and sensitivity to nonreward were relatively independent traits, the BIS accounting for a larger proportion of the variance in FNR subscale score in comparison with reward responsiveness score. By contrast, Carver (2004) found that individuals with high levels of BAS activity showed higher anger in response to nonreward. In the present study, Sensitivity to Reward positively correlated with all the FI Scales and Sub-scales, whereas Sensitivity to Punishment showed positive correlations with most of them (except for Uncontrollable external cause, Forced expectancy change and Job disappointment of the ISTF Scale). Present results thus indicate that both motivational systems mediate individual differences in FI, with a less clear association between Sensitivity to Punishment and the behavioral component of FI. The involvement of both motivational systems in the processing of nonreward is in accordance with previous studies. Positive correlations have been reported between Sensitivity to Punishment and gray matter volumes in the amygdala and the hippocampal formation (Barrós Loscertales *et alia*, 2006), brain areas associated with the BIS and also involved in the processing of nonreward (Ortega, Solano, Torres, & Papini, 2017). The fact that the detection of reward loss in nonhumans animals was also dependent on brain areas involved in reward processing (e.g. nucleus accumbens) is consistent with a role of Sensitivity to Reward in FI (Genn, Ahn, & Phillips, 2004).

FI has been considered a risk marker for a variety of emotional-behavioral problems (Jeronimus *et alia*, 2017; Filippello *et alia*, 2014; Gatzke-Kopp *et alia*, 2015; Ramírez Castillo *et alia* 2019). Present results suggest that a systematic analysis of the components of FI will be necessary in future studies for a better understanding of the relationship between personality dimensions and differential profiles of coping with resource loss and failure.

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