Influence of vulnerability factors in panic disorder severity

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Abstract

Background: We studied herein the predictive value for panic severity of three well-based vulnerability factors: personality traits (neuroticism and extraversion; NEO-PI-R), anxiety sensitivity (ASI), and perceived control (ACQ-R). **Method:** The sample was composed of 52 participants diagnosed with panic disorder, with or without agoraphobia, according to DSM-IV-TR criteria. **Results:** Our results revealed that the anxiety facet is a better predictor of panic severity than neuroticism. Anxiety sensitivity increases the predictive value for panic severity and, finally, perception of control of emotions is the only perception control subscale that increases the predictive value for panic severity more than the anxiety facet and anxiety sensitivity. **Conclusions:** This finding supports the assumption of the importance of taking into account the assessment of the lower order dimensions of the vulnerability factors in the field of psychopathology studies. Furthermore, the predictive value of perception of control of emotions indicates the importance of this specific vulnerability factor in the etiology of panic disorder (with or without agoraphobia) and, thus, shows the necessity to include emotion regulation strategies in the psychological treatments.

Keywords: Panic disorder, personality, anxiety sensitivity, perceived control, panic severity.

Resumen

Influencia de factores de vulnerabilidad en la gravedad del trastorno de pánico. **Antecedentes:** en este trabajo se estudia el valor predictivo sobre la gravedad del pánico de tres factores de vulnerabilidad bien establecidos: rasgos de personalidad (neuroticismo y extraversión; NEO-PI-R), sensibilidad a la ansiedad (ASI) y percepción de control (ACQ-R). **Método:** la muestra fue de 52 participantes con diagnóstico de trastorno de pánico, con o sin agorafobia, según criterios DSM-IV-TR. **Resultados:** nuestros resultados revelan que la faceta de ansiedad es mejor predictor de la gravedad del pánico que el neuroticismo. La sensibilidad a la ansiedad aumenta el valor predictivo sobre la gravedad del pánico y, finalmente, la percepción de control de las emociones es la única subescala de la percepción de control que aumenta la capacidad predictiva más allá de la faceta de ansiedad y la sensibilidad a la ansiedad. **Conclusiones:** estos resultados apoyan el supuesto sobre la importancia de evaluar las dimensiones de orden inferior de los factores de vulnerabilidad en los estudios psicopatológicos. Además, el valor predictivo de la percepción de control de las emociones indica la importancia de este factor específico de vulnerabilidad en la etiología del trastorno de pánico (con o sin agorafobia) lo que muestra la necesidad de incluir estrategias de regulación emocional en los tratamientos psicológicos.

Palabras clave: trastorno de pánico, personalidad, sensibilidad a la ansiedad, percepción de control, gravedad del pánico.

Panic disorder (PD) is one of the most commonly found pathologies in the clinical practice of mental health. The essence of this anxiety disorder is unexpected panic attacks and apprehension about the possibility of experiencing panic symptoms. This state of hypervigilance and activation provokes considerable interference, resulting in behavioral, cognitive, and emotional symptoms (Wittchen & Jacobi, 2005). Another syndrome closely related to PD is agoraphobia (AG), which is characterized by intense fear in various places or situations from which escape might be difficult or help may not be available in case of having a panic attack. As a result, these situations are avoided or endured with great distress.

With regard to the influence of the onset, course, and maintenance of PD with AG (PDA) or without AG (*Diagnostic and Statistical Manual of Mental Disorders-Text Revision- 4th edition* [DSM-IV-TR] American Psychiatric Association [APA], 2000), some psychological vulnerability factors have been described such as personality constructs (neuroticism and extraversion), anxiety sensitivity, catastrophic misinterpretations of bodily sensations, panic self-efficacy, and perceived control. All of them seem to be supported by sufficient empirical evidence in anxiety disorders in general (Bienvenu et al., 2004; Brown & Barlow, 2009; Gallagher, Bentley, & Barlow, 2014) and specifically in PD/PDA (Bentley et al., 2013; Carrera et al., 2006; Casey, Oei, Newcombe, & Kenardy, 2004; Sandín, Sánchez-Arribas, Chorot, & Valiente, 2015; White, Brown, Somers, & Barlow, 2006).

The personality dimensions most closely related to anxiety and mood disorders are neuroticism and extraversion (Bienvenu et al., 2004; Carrera et al., 2006; Kotov, Gamez, Schmidt, & Watson, 2010). In order to observe whether a more specific personality picture emerges in the different disorders, some researchers have focused on the analysis of lower order personality facets. In this regard, both PD and AG patients have low scores on the personality facets of positive emotions, warmth, trust, and compliance; PD

patients have low scores on assertiveness and competence; and AG patients present lower levels of self-discipline (Bienvenu et al., 2004).

Another interest in the study of lower order facets is their predictive power for human behavior and whether this value is incremental when the main personality dimensions are removed from the model. In this sense, a large amount of literature is accumulating that shows that a variety of outcomes can be better predicted by measuring each lower order facet of the NEO-PI-R (Costa & McCrae, 1992) rather than just using global measures of the Big Five factors (e.g., Ekehammar & Akrami, 2007). However, we found no other studies examining the incremental validity of lower order personality facets over personality dimensions (especially neuroticism and extraversion) for the prediction of panic severity. This is one of the objectives of this study.

Another psychological vulnerability factor related to PD samples is anxiety sensitivity. Anxiety sensitivity is defined as the fear of anxiety and its physical sensations and their possible consequences (Reiss & McNally, 1985). This construct is commonly measured by the Anxiety Sensitivity Inventory (Peterson & Reiss, 1993). Drost et al. (2012) investigated the incremental validity of different cognitive constructs such as pathological worry, cognitive reactivity, and anxiety sensitivity to predict sad mood over and above the personality traits neuroticism and extraversion. They found that anxiety sensitivity was the best predictor in PD and social anxiety disorder.

In addition, both catastrophic misinterpretation of bodily sensations and panic self-efficacy are centrally related to the core features of PD (Casey et al., 2004). In this regard, a recent study of Sandín et al. (2015) indicated that anxiety sensitivity, catastrophic misinterpretations, and panic self-efficacy independently predicted PD severity. Results of path analyses indicated that anxiety sensitivity was directly and indirectly (mediated by catastrophic misinterpretations) related to panic severity.

Regarding perceived control, there seems to be sufficient empirical evidence of its influence in contemporary models of psychopathology (Barlow, 2002). Barlow described anxiety as a cognitive-affective process whereby the individual has a sense of unpredictability and uncontrollability of events and feels potentially negative or harmful emotions. This sense of uncontrollability is associated with physiological arousal, anxious apprehension, and uncertainty about the ability to handle threats. The Anxiety Control Questionnaire-Revised (ACQ-R; Brown, White, Forsyth, & Barlow, 2004) was designed to evaluate perceived control in a variety of potentially threatening situations/events, both internal and external, which are directly related to emotional disorders (e.g., Brown et al., 2004). The ACQ-R is composed of three lower order subscales: emotional control, threat control, and stress control.

Bentley et al. (2013) showed that individuals with elevated levels of anxiety sensitivity were at heightened risk for displaying more severe manifestations of PD symptoms when a diminished sense of perceived control was also present. These findings indicated the interactive effect of both vulnerability factors.

In the past decade, research has focused on the study of the influence, modulating effect, or predictive value of perceived control for relevant clinical variables in PD such as agoraphobic avoidance (e.g., White et al., 2006), fear of physical sensations (e.g., Gregor & Zvolensky, 2008), or psychological adjustment (e.g., Sokolowski & Israel, 2008), but none on panic severity. Most of the studies that have used the ACQ-R took into consideration the

total score of perceived control instead of the subscales. However, the differential effect of the ACQ-R subscales on other clinical factors such as symptom severity could provide more relevant information in the field of emotional or related disorders.

Given that some of the vulnerability factors have received increased attention in their relationship with panic severity (e.g., catastrophic misinterpretations and panic self-efficacy), our aim is to contribute to the study of the relationship of personality (neuroticism and extraversion), anxiety sensitivity, and perceived control with panic severity in a PD/PDA sample, emphasizing their lower order dimensions.

Method

Participants

The final sample consisted of 52 participants (50% women) with an average age of 32.02 years (*SD*=10.39). Forty-four of the participants in the study met the criteria for PDA and eight the criteria for PD as a principal diagnosis. Regarding comorbidity diagnosis, 15 participants (28.8%) presented a secondary diagnosis of anxiety disorder, and six presented comorbidity with mood disorders (11.5%). Thirty-three participants (63.5%) were receiving pharmacological treatment in the assessment period with anxiolytics (28.8%), antidepressants (3.8%) or both (30.8%). The mean duration of their disorder was 5.0 years (*SD* = 5.0 years; ranging from 4 months to 17 years).

Regarding marital status, 31 of the participants had never been married, 18 were married, and 3 were divorced or separated. Regarding achieved educational level, 29 participants had completed high school, 20 held a university degree, and 3 participants had completed elementary school. Finally, with regard to occupational level, 20 of the participants were skilled workers, 14 were students, 14 were unskilled workers, and 4 participants were unemployed.

Instruments

Anxiety Disorders Interview Schedule Lifetime Version. The ADIS-IV-L (Brown, Di Nardo, & Barlow, 1994) is a structured diagnostic interview designed to comprehensively assess anxiety disorders according to DSM-IV-TR (APA, 2000) criteria. In this study, the versions for PD and AG were used. The test-retest reliability found varies, depending on the study, from .68 to 1 (e.g., Brown, Campbell, Lehman, Grisham, & Mancill, 2001). We used the Spanish translation by Botella and Ballester (1997).

Panic Disorder Severity Scale. The PDSS (Houck, Spiegel, Shear, & Rucci, 2002) is a 7-item scale to be administered by the clinician. Each item, rated on a 5-point Likert scale, is carefully anchored and assesses panic frequency, distress during panic, panic-focused anticipatory anxiety, phobic avoidance of situations, phobic avoidance of physical sensations, impairment in work functioning, and impairment in social functioning. Individual responses are scored on a scale of 0-4, and total scores range from 0 to 28. The Spanish version of the PDSS (Santacana et al., 2014) has obtained a Cronbach's alpha of .85, a test-retest reliability of .77, good convergent and divergent validity, and was sensitive to change.

NEO Personality Inventory-Revised. The NEO-PI-R (Costa & McCrae, 1992) assesses personality from a dimensional approach with 240 items. The person responds to the inventory on

a 5-point scale ranging from 1 = *disagree* to 5 = *strongly agree*. The NEO-PI-R provides a personality profile based on the five basic dimensions or factors (neuroticism, extraversion, openness, conscientiousness, and agreeableness) and their facets. The lower order facets of the factors used in this study for neuroticism are: anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability, and for extraversion: warmth, gregariousness, assertiveness, activity, excitement seeking, and positive emotion. Regarding reliability, alpha coefficients between .86 and .92 were obtained, test-retest correlations for the factor scores ranged between .86 and .91, and for the facets between .69 and .92. We used the Spanish version by Cordero, Pamos, and Seisdedos (2008).

Anxiety Sensitivity Index-Revised. The ASI (Peterson & Reiss, 1993) is a questionnaire containing 16 items that measure the fear of anxiety symptoms that a person can experience. Each item is rated on a 5-point Likert scale ranging from 0 = *not at all* to 4 = *very much*, and total scores range from 0 to 64. Higher scores indicate higher levels of anxiety sensitivity. The internal consistency range varied between .82 and .91, and test-retest reliability was satisfactory, with correlations ranging between .71 and .75 (Peterson & Reiss, 1993). We used the Spanish version (Sandín,Valiente, Chorot, & Santed, 2005). When we started data collection, the newest version of the ASI had not been validated in Spanish (ASI-3; Sandín, Valiente, Chorot, & Santed, 2007). To maintain the assessment protocol constant through all participants, we decided to keep the same ASI version for all of the participants in the study. The original version of the ASI used has shown good psychometric properties of reliability and validity.

Anxiety Control Questionnaire-Revised. The ACQ-R (Brown, et al., 2004) consists of 15 items that describe particular beliefs related to perceived control over anxiety. The 6-point response scale ranges from 0 = *strongly disagree* to 5 = *strongly agree*, and total scores range from 0 to 75. The structure of the ACQ consists of three lower order dimensions: emotional control, threat control, and stress control. The questionnaire has shown good reliability for the full scale with a Cronbach´s alpha of .80, and also for the three subscales, .73 for emotional control and threat control, and .71 for stress control. We used the Spanish version from Authors (2015; *changed to guarantee blind review*). In this version, Cronbach's alpha was satisfactory for all the scales, with all alphas equal or higher than .75.

Procedure

The initial sample was composed of 80 participants and was obtained through two private clinical centers PREVI center in Valencia and Castellón, CREOS, Centro de Psicoterapia y Formación [Center of Psychotherapy and Formation] in Castellón. All participants in the study were evaluated by different clinicians with experience in the assessment of emotional disorders with a structured interview to establish the diagnosis attending to DSM-IV-TR (APA, 2000) criteria (ADIS-IV-L; Brown et al., 1994). The following exclusion criteria were established: being younger than 18 years; diagnosis of schizophrenia, bipolar disorder, mental retardation, developmental disorder or severe organic disease; diagnosis or history of substance dependence; currently receiving psychological treatment for PD/PDA; and not providing complete assessment data. Following these criteria, 28 participants were excluded (5 due to the diagnosis of bipolar disorder, 13 due

to current psychological treatment, and 10 due to incomplete assessment).

All the participants were informed of the study, and their consent and participation in it were requested. The study had the approval of the ethical committees of all the centers that participated in the research.

Data analysis

We calculated descriptive statistics and correlations between all variables administered ($p<.05$). Partial correlations were calculated first between PDSS and neuroticism (factor and facets), controlling for sex and age; sex, age and neuroticism; and sex, age, and anxiety. Subsequently, partial correlations were calculated between PDSS and the ACQ-R subscales scores, while controlling for were age, sex, anxiety, and ASI scores. Finally, hierarchical regression models were calculated to study the predictive value for PDSS according to the inclusion of the neuroticism factor or the anxiety facet. Analyses were carried out with SPSS 20, except for the comparison of the correlation coefficients. For that purpose we used the statistic proposed by Meng, Rosenthal, and Rubin (1992), as implemented in the *cocor* R package (Diedenhofen & Musch, 2015).

Results

Regarding PDSS, Table 1 shows the comparative results between the PD/PDA sample and normative results provided by the authors of the instrument (Shear et al., 1992) for persons with moderate PD and AG. The scores obtained by the sample of this study were similar, or in some cases, they exceeded the scores for clinical samples reported in PDSS in all scales except for panic attack frequency, which is lower. This may be because a high percentage of our sample (63.5%) was receiving drug treatment during the evaluation. The mean and standard deviation of the total scale of the PDSS was 13.08 ($SD = 4.77$).

Scores in the NEO-PI-R of the dimensions and facets are in a T-metric, that is, mean equal to 50 and standard deviation equal to 10. With regard to the personality profile, taking into account personality dimensions and lower order facets, it can be observed in Table 2 that the PD/PDA sample is characterized by very high scores on neuroticism, anxiety, and vulnerability; high scores in the rest of the facets of the neuroticism factor; and low extraversion and in all its facets except for excitement-seeking, which obtained average scores. The mean and standard deviation scores for the PD/PDA sample on the ASI was 30.67 ($SD = 11.05$) and on the total scale of ACQ-R was 33.65 ($SD = 10.69$).

Table 1
Means (standard deviations) of normative data reported by PDSS authors (Shear et al., 1992) and current sample

	Normative data	Current sample
Panic attack frequency	1.83 (0.82)	1.28 (0.82)
Distress during panic attacks	2.19 (0.61)	2.19 (1.25)
Severity of anticipatory anxiety	1.94 (0.75)	1.88 (0.92)
Phobic avoidance of situations	1.23 (0.65)	2.25 (1.08)
Phobic interoceptive avoidance	1.08 (0.58)	1.69 (1.11)
Work interference	1.29 (0.98)	1.80 (1.02)
Social interference	1.55 (0.82)	2.00 (0.84)

Table 2
Descriptive Statistics (Means and SD) and Correlations between Variables

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. PDSS	13.08	4.77																				
2. Age	32.02	10.39	**.30**																			
3. Sex	0.50	0.50	.15	.27																		
4. Neuroticism	68.32	10.81	.22	–.19	–.22																	
5. Anxiety	68.65	10.82	**.41**	.05	–.13	**.75**																
6. Angry hostility	62.81	10.89	.04	–.11	–.22	**.72**	**.40**															
7. Depression	64.74	12.96	.16	–.16	–.19	**.87**	**.56**	**.60**														
8. Self-Consciousness	60.06	10.30	.00	–.13	–.14	**.74**	**.44**	**.39**	**.66**													
9. Impulsiveness	58.85	9.38	.14	–.24	–.27	**.32**	.24	.25	.08	–.02												
10. Vulnerability	70.45	14.49	.18	–.25	–.04	**.84**	**.60**	**.51**	**.68**	**.61**	.07											
11. Extraversion	39.64	13.01	.09	–.07	.18	**–.37**	–.22	–.15	**–.53**	**–.57**	**.47**	**–.39**										
12. Warmth	40.70	12.25	.11	–.05	.09	–.28	–.01	–.27	**–.41**	**–.48**	**.35**	–.22	**.79**									
13. Gregariousness	39.93	10.67	–.09	–.20	.26	–.19	–.01	–.18	**–.36**	**–.35**	**.36**	–.10	**.75**	**.66**								
14. Assertiveness	44.06	12.90	.19	.19	.02	**–.40**	–.30	–.06	**–.38**	**–.55**	.28	**–.53**	**.71**	**.52**	.22							
15. Activity	45.30	11.69	.23	.16	.17	–.20	–.05	.03	**–.41**	**–.38**	**.35**	–.22	**.61**	**.32**	**.40**	**.34**						
16. Excitement-Seeking	49.50	11.81	–.11	**–.34**	.10	.01	–.16	.27	–.11	–.08	**.33**	–.08	**.58**	.21	**.35**	**.35**	.26					
17. Positive emotions	39.36	13.42	.06	–.06	.12	**–.52**	**–.37**	**–.39**	**–.61**	**–.58**	**.38**	**–.47**	**.84**	**.69**	**.63**	**.54**	**.38**	**.32**				
18. ASI	30.67	11.06	**.52**	.17	–.02	**.30**	**.39**	.16	.23	.07	.22	.23	.08	.09	–.06	.25	.07	–.04	–.01			
19. ACQ-R Emotional	8.31	4.42	**–.40**	.08	.01	–.19	**–.30**	–.07	–.15	.01	–.14	–.18	–.24	**–.33**	–.21	–.16	–.06	–.07	–.23	**–.31**		
20. ACQ-R Threat	17.23	5.88	**–.28**	–.12	.19	**–.37**	**–.32**	**–.38**	**–.39**	–.18	–.17	–.16	.14	.25	.22	–.04	.06	.00	.15	–.29	.07	
21. ACQ-R Stress	8.10	4.53	–.23	–.04	.06	**–.49**	**–.37**	**–.45**	**–.47**	**–.39**	.00	**–.39**	.25	**.30**	.16	.21	.05	.00	**.33**	–.21	.14	**.60**

Note: *M*: Mean; *SD*: Standard Deviation; PDSS: Panic Disorder Severity Scale; ASI: Anxiety Sensitivity Index; ACQ-R: Anxiety Control Questionnaire Revised. Bold values correspond to statistically significant correlations (*p*<.05). Sex was coded with a dummy variable, where 0 = women and 1 = men

Table 2 shows the results of the correlation analysis. Focusing on the correlations with the PDSS, four variables showed a statistically significant correlation: age (*r* = .30), the anxiety facet (*r* = .41), ASI scores (*r* = .52), and the Emotional dimension of the ACQ (*r* = –.40). Contrary to our expectations, neither extraversion nor any of its facets showed a statistically significant correlation with PDSS, with all |*r*| ≤ .23.

When comparing the predictive value of neuroticism and its facets with respect to PDSS, the anxiety facet was the only facet with higher correlation (*r* = .41 versus *r* = .22). This difference in the correlation coefficients was statistically significant, *z* = 2.04, *p* = .041.

Once we have seen that a facet of neuroticism, anxiety, offered higher correlation than the general dimension, we checked whether each predictor remained statistically significant when controlling for each other. When we computed partial correlations, which can be seen in Table 3, controlling for age and sex as control variables of PDSS with neuroticism and with anxiety, both correlations were statistically significant: for neuroticism, r_p = .31, p = .026; for anxiety, r_p = .43, p = .002. When adding neuroticism as control variable, the PDSS-anxiety partial correlation slightly dropped, r_p = .32, but remained significant, *p* = .027. However, when we added anxiety as control variable, the PDSS-neuroticism became trivial, r_p = –.04, *p* = .802. No other facet of neuroticism showed statistically significant partial correlations.

Partial correlations were used to determine whether the ACQ-R subscales obtained a statistically significant correlation with PDSS when controlling for third variables such as age, sex, anxiety facet, and ASI. The only ACQ-R subscale that obtained a negative and significant correlation with panic severity was ACQ-R emotional control, r_p=–.30, *p*=.040.

Lastly, to determine the differential predictive value for panic severity (PDSS), we used two hierarchical regression models (Table 4): one predictive model from a more traditional approach, that is using a higher order dimension (in our case neuroticism, that was the higher order personality dimension more related to panic severity) and the other model predicting from anxiety (a lower order dimension and the only personality facet showing statistically significant differences in the correlation with PDSS, due to its close relationship with PD/PDA psychopathology). In both regression models, we entered sociodemographic data (sex and age), the ASI scores, and the Emotional ACQ-R subscale scores. There are three main results. First, the R^2 for the models including

Table 3
Partial correlations between PDSS and neuroticism and the different facets of neuroticism

	Controlling for...		
	Sex and age	**Sex, age, and neuroticism**	**Sex, age, and anxiety**
Neuroticism	**.31** (.026)		–.04 (.802)
Anxiety	**.43** (.002)	**.32** (.027)	
Angry hostility	.09 (.512)	–.19 (.188)	–.09 (.539)
Depression	.23 (.102)	–.08 (.595)	–.02 (.907)
Self-Consciousness	.05 (.720)	–.28 (.054)	–.17 (.242)
Impulsiveness	.26 (.071)	.19 (.186)	.18 (.219)
Vulnerability	.28 (.051)	.02 (.872)	< .001 (> .999)

Note: Bold values correspond to statistically significant correlations (*p*<.05)

anxiety as predictor was always higher than the R^2 for the models including neuroticism. For instance, when the predictors were sex, age, and neuroticism (or anxiety), the adjusted R^2 were .134 and .219. The difference between models was reduced with additional predictors included in the equation. Second, the higher increment in R^2 was achieved when anxiety sensitivity was introduced in the models (Level 3). This is also reflected by ASI having the higher β value. Third, in the model where sociodemographic variables, neuroticism (or anxiety), ASI, and Emotional ACQ-R were included (Level 4), the personality scores did not reach statistical significance ($p = .274$ for neuroticism and $p = .086$ for anxiety). In these models, both ASI and Emotional scores of the ACQ-R were statistically significant.

Discussion

The main goal of our study was to analyze, in a PD/PDA sample, the differential influence on panic severity of some of the main psychopathology vulnerability factors found in recent literature: neuroticism and extraversion, anxiety sensitivity, and perceived control. The contribution of this study was to explore the role of the lower order dimensions of these factors on panic severity.

Our results are in line with those obtained by other authors indicating that patients with PD/PDA present high or very high scores in neuroticism and low scores in extraversion (Bienvenu et al., 2004; Carrera et al., 2006; Kotov et al., 2010), and they also agree with those of Bienvenu et al. (2004), who obtained low

scores in positive emotions, warmth and assertiveness —lower order personality facets. We also found that neither neuroticism nor extraversion obtained statistically significant correlations with panic severity, as measured by the PDSS (only when controlling for age and sex neuroticism obtained a significant and positive correlation with panic severity).In the Carrera et al. (2006) study, none of the Big Five personality factor scores significantly predicted initial clinical severity with the PDSS. We agree with these authors when they explained the outcomes obtained due to the utilization of the Big Five personality model proposed to conceptualize personality dimensions in normal subjects, not in clinical samples.

With regard to the predictive value of higher or lower order personality traits, we found that the anxiety personality facet provides incremental validity to the global dimension (neuroticism) in the prediction of panic severity in a PD/PDA sample. In accordance with other authors and with our initial expectations, our data indicate that it may be more useful to consider the lower order personality facets rather than the overall personality dimensions in psychopathology studies (e.g., Ekehammar & Akrami, 2007).

Regarding anxiety sensitivity, as Schmidt, Zvolensky, and Manera (2006) concluded, it is related to panic severity and psychopathology. In our study, the PD/PDA sample obtained high anxiety sensitivity scores, and there was a significant positive association between anxiety sensitivity and panic severity and other psychopathology variables, such as neuroticism and anxiety. In the line of the results obtained by Drost et al. (2012), we also

Table 4
Hierarchical regression models predicting PDSS from neuroticism and anxiety

	Models predicting PDSS from Neuroticism						**Models predicting PDSS from Anxiety**				
	R^2	**Adjusted R^2**	**ΔR^2**	**F**	**p**		**R^2**	**Adjusted R^2**	**ΔR^2**	**F**	**p**
Level 1	.096	.059	.096	2.593	.085	Level 1	.096	.059	.096	2.593	.085
			β	*t*	*p*				β	*t*	*p*
Age			.278	1.972	.054	Age			.278	1.972	.054
Sex			.080	0.571	.571	Sex			.080	0.571	.571
Level 2	.185	.134	.089	5.244	**.026**	Level 2	.265	.219	.169	11.053	**.002**
			β	*t*	*p*				β	*t*	*p*
Age			.323	2.365	**.022**	Age			.238	1.848	.071
Sex			.136	0.989	.328	Sex			.146	1.125	.266
Neuroticism			.309	2.290	**.026**	Anxiety			.417	3.325	**.002**
Level 3	.345	.289	.160	11.474	**.001**	Level 3	.384	.332	.119	9.107	**.004**
			β	*t*	*p*				β	*t*	*p*
Age			.220	1.721	.092	Age			.180	1.490	.143
Sex			.138	1.108	.273	Sex			.148	1.235	.223
Neuroticism			.160	1.236	.223	Anxiety			.271	2.155	**.036**
ASI			.432	3.387	**.001**	ASI			.381	3.018	**.004**
Level 4	.417	.353	.072	5.680	**.021**	Level 4	.439	.378	.054	4.465	**.040**
			β	*t*	*p*				β	*t*	*p*
Age			.258	2.106	**.041**	Age			.220	1.861	.069
Sex			.124	1.040	.304	Sex			.132	1.135	.262
Neuroticism			.138	1.107	.274	Anxiety			.217	1.754	.086
ASI			.342	2.684	**.010**	ASI			.315	2.504	**.016**
ACQ-R Emot			−.287	−2.383	**.021**	ACQ-R Emot			−.254	−2.113	**.040**

Note: PDSS: Panic Disorder Severity Scale; ASI: Anxiety Sensitivity Index; ACQ-R Emot: *Emotional* dimension of the Anxiety Control Questionnaire Revised. Sex was coded with a dummy variable, where 0 = women and 1 = men. Bold values correspond to statistically significant correlations (*p*<.05)

found that anxiety sensitivity increased the predictive value for panic severity more than the neuroticism and anxiety personality traits when using hierarchical regression models.

In connection with perceived control, our results are in the line of those obtained by Bentley et al. (2013), who found a relationship between perceived control, anxiety sensitivity, and PD symptoms. The PD/PDA sample of this study showed high anxiety sensitivity scores, high panic severity symptoms, and lower perceived control scores. These data support the hypothesis of considering diminished perceived control a vulnerability factor in PD/PDA samples (Barlow, 2002). In addition, all the perceived control subscales were negatively associated with the anxiety personality facet. Moreover, the only perceived control subscale associated with panic severity was perceived control of emotions. Once more, the study of lower order facets can provide more specific information about the clinical psychopathology related to a specific disorder (Costa & McCrae, 1992).

Our results underline the specific contribution of perceived control of emotions to the psychopathology of PD/PDA, and more specifically, we found that perceived control of emotions has a predictive value for relevant clinical variables in PD/PDA, such as panic severity. Perceived control of emotions reflects the ability to control one's internal emotional reactions. In this regard, patients with emotional disorders usually experience a sense of uncontrollability of their internal emotional reactions, presenting difficulties to manage their emotions (understanding emotions, negative reactions to emotions, difficulty to repair negative

emotions, i.e.,Turk, Heimberg, Luterek, Mennin, & Fresco, 2005). Cognitive-behavioral theories of emotional disorders have widely contributed to the understanding and treatment of these disorders. However, these theories have shortcomings, mainly related to their emphasis on cognition and behavior and their tendency to diminish the role of emotions. Our results support the assumption that the role of emotion regulation is becoming a priority in the conceptualization of emotional disorders (Gross, 2007), and treatment programs for emotional disorders should be developed with an emphasis in emotion regulation (i.e., Campbell-Sills & Barlow, 2007).

One of the most important limitations of our study is the small number of participants. Therefore, the results should be regarded as preliminary data. It would have been interesting to increase the number of PD patients to conduct a differential analysis of two clinical samples, PD and AG. Future research should continue to explore the differential contribution of the vulnerability factors—taking into account the lower order facets—to the psychopathology of PD/PDA (emotional disorders). The results achieved from this research field will contribute to building more solid etiology theories and psychological treatments for emotional disorders.

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