The different meanings of impulsiveness related to the Millon Clinical Multiaxial Inventory (MCMI-III) model in anxiety disorders

I diversi significati dell'impulsività connessi al modello del Millon Clinical Multiaxial Inventory (MCMI-III) nei disturbi d'ansia

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Key words

Anxiety disorder • Novelty seeking • MCMI-III • Personality patterns • Impulsiveness

Summary

Objective

The association of impulsiveness with personality traits in a sample of patients with anxiety disorders is relevant to understand its meaning within the several psychopathological dimensions of personality and clinical syndromes.

The aim of the study was to describe within anxiety disorders several psychopathological features according to Millon's dimensional model evaluating possible correlations with different (or partially convergent) models of impulsiveness as reflected by Cloninger's Temperamental and Character Inventory with special attention to the Novelty Seeking dimension, and by Barratt's classical Impulsiveness construct, explored through the Barratt Impulsiveness Scale.

Method

Forty-five consecutive outpatients with anxiety disorders were assessed using the Millon Clinical Multiaxial Inventory (MCMI-III) to evaluate personality and clinical dimensions, and Cloninger's Temperamental and Character Inventory and Barratt Impulsiveness Scale to assess the impulsiveness-novelty seeking dimension.

Results

Only attentional (i.e. cognitive) impulsiveness showed strong positive correlations with Schizoid, Depressive, Schizotypal and Borderline personality scales and a negative correlation with the Compulsive personality scale (Table III). Attentional impulsiveness correlated with Millon's mood related symptoms. The BIS Impulsiveness and Cloninger's Temperamental and Character Inventory Novelty Seeking dimensions differentially correlated with most of Millon's dimension suggesting some differences in their constructs.

Conclusion

Our study suggests that impulsiveness within the anxiety disorders is better described by dimensional instruments (i.e. Cloninger's Temperament and Character Inventory and the Millon Clinical Multiaxial Inventory) and their underlying constructs. Furthermore, clinicians should pay attention to borderline and schizotypal traits, even in outpatients samples, as a possible source of noncompliance or other impulsiveness-related issues (i.e., drug abuse or violence) and mood symptoms.

Introduction

Impulsivity is a construct mentioned in the Diagnostic and Statistical Manual of Mental Disorder-IV edition (DSM-IV) as diagnostic criteria for several disorders and it is implied in the criteria for others, but it is not explicitly defined [1 2]. Barratt and Patton [3] have suggested that impulsivity can be a component of motivated behaviours and it can have

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multiple expressions. Swan et al. [4] proposed two components of impulsivity: trait-dependent, reflecting personality dimension, and state-dependent components, related to biological measures of impulsivity such as level of serotonergic function and noradrenergic function, respectively. There is now wide agreement that impulsivity is not an unidimensional construct but probably consists of a number of related dimensions. To some extent the difficulties in defining the construct of impulsivity have been complicated by the nature of underlying theoretical model of personality in which the construct is conceptualised [5]. Cloninger's personality taxonomy proposed an explicit impulsivity dimension labelled Novelty Seeking (NS), that reflected an exploratory activity in response to novel stimuli [6]. In contrast, Cloninger's dimension of Harm Avoidance (HA) reflected individual differences in inhibited behaviour [6]. Conceptually similar to Cloninger's NS and HA, Gray's theory of personality proposed two independent biologically based dimensions of motivation and personality: impulsivity and anxiety. These two dimensions reflected individual differences of sensitivity to rewarding stimuli and individual variations in sensitivity to learned signals of punishment, novel stimuli and frustrative non-reward, respectively [7].

Even though the impulsivity evaluation has been mainly reported among more severe mental disorders, a relationship between anxiety disorders and impulsivity has been proposed along several lines of evidence [8]. Previous studies found that anxiety disorder groups displayed comparably more elevated impulsivity levels than controls [9]. Clinical and research findings remain inconsistent, with support cited for two different conceptualizations of the relationship between compulsivity and impulsivity in obsessive compulsive disorder, one that highlights commonalities, and one that views the two constructs as divergent [9].

Summerfeldt et al. showed that other anxiety disorders like Social Phobia and Panic Disorder were characterised by impulsiveness assessed by Barratt Impulsiveness Scale-version 11(BIS-11) [10]. Also post traumatic stress disorder was characterised by anxiety symptoms and impulsiveness [11].

The aim of the study was to assess within the anxiety disorders several psychopathological features according to Millon's dimensional model evaluating possible correlations with different (or partially convergent) models of impulsiveness as reflected by the Cloninger's Temperamental and Character Inventory (TCI-125) with special attention to the NS dimension and Barratt's classical Impulsiveness constructs, explored by BIS-11. These instruments were selected because in line with a dimensional approach covering a variety of clinical personality patterns, severe personality pathology, clinical syndromes otherwise missed in the categorical evaluation [12]. The Millon Clinical Multiaxial Inventory (MCMI-III) is more suitable to describe all the features which are to be correlated to the impulsivity as conceptualised and evaluated by TCI- NS and BSI-11.

Methods

The subjects were 45 consecutive outpatients with anxiety disorders evaluated at Villa Serena Medical Centre (VSMC), a psychiatric tertiary referral centre. Patients were diagnosed as affected by anxiety disorders according to DSM-IV criteria [1]. In order to limit the study to a more homogeneous sample, the exclusion criteria were age under 18 years old, diagnoses of organic brain disorders or mental retardation, and a mental status of being highly agitated or floridly psychotic.

All subjects gave written informed consent to participate at the study, as approved by our Human Studies Committee.

Temperamental and Character Inventory (TCI-125) full version is 240-items self-report questionnaire whose response format is true /false. In this study the 125-items short version was used. TCI gives a measure for the seven personality dimensions and 25 more specific traits that define temperament and character [13]. We only used the Novelty Seeking scores (NS1 = Exploratory excitability; NS2 = Impulsiveness; NS3 = Extravagance; NS4 = Disorderliness). The Italian version has been translated by Battaglia and colleagues (personal communication) and previously used [14].

The Millon Clinical Multiaxial Inventory (MCMI-III) is a 175 items, true/false self-report inventory designed for use among clinical populations [15]. It yields 11 personality styles, 3 pathological personality disorders (i.e. schizotypal, borderline, and paranoid), 7 clinical syndromes and 3 severe syndromes scales. Raw scores on MCMI-III scales were converted to Base Rate (BR) scores as described by Millon. The BR transformation adjusts raw scale scores so that the proportion of patients who score above each scale cut-off point matches

the actual prevalence among a representative national population of patients [15].

The Barratt Impulsiveness Scale-Version 11 (BIS-11) consists of 30 self-descriptive items, with responses in a four point Likert-type scale ranging from "Rarely/Never" to "Almost Always/Always". It consists of three domains: Attentional impulsiveness (AI), Motor impulsiveness (MI), and Non-planning impulsiveness (NP) [16]. AI evaluates actions precipitated by lack of attention; it can be exacerbated in anxious situations. MI evaluates hyperactivity due to need of movement, which is exacerbated by stress. NP evaluates attitudes and conclusions precipitated by lack of reflection. The instrument is translated and validated in Italian literature [17].

Statistical analyses were performed using SPSS [18]. Pearson correlation analyses were performed to examine the relationship between the TCI NS scale scores together with BIS scores and the MCMI-III personality disorder and clinical syndromes scales.

TABLE I.
Millon Clinical Multiaxial Inventory-III (MCMI-III) Means, Standard Deviation (SD) and Base Rate Scores for personality scales and clinical syndromes (n = 45). *Medie, deviazioni standard (DS) e punteggi base alle scale di personalità e sindromi cliniche del Millon Clinical Multiaxial Inventory-III (MCMI-III) (n = 45).*

Scale	Mean	SD	% BR > 74
Clinical personality patterns			
Schizoid	62.29	16.64	20
Avoidant	62.93	21.21	33
Depressive	64.20	26.12	40
Dependent	65.42	22.80	53
Histrionic	49.51	19.03	9
Narcissistic	64.53	21.54	29
Antisocial	51.06	21.35	7
Aggressive	56.82	19.46	9
Compulsive	51.86	21.44	16
Passive-aggressive	69.73	18.14	44
Self-defeating	56.57	25.17	24
Severe personality pathology			
Schizotypal	57.04	23.28	13
Borderline	58.64	23.23	27
Paranoid	59.95	24.61	27
Clinical syndromes			
Anxiety	80.82	18.95	87
Somatoform	58.60	21.99	11
Bipolar-manic	60.68	16.18	16
Dysthymia	63.89	25.38	47
Alcohol dependence	49.55	23.37	9
Drug dependence	50.42	21.28	9
Post traumatic	60.60	17.59	11
Severe clinical syndromes			
Thought disorder	61.71	22.71	20
Major depression	59.29	27.86	24
Delusional disorder	52.08	32.61	16

Results

Forty-five outpatients with anxiety disorders were assessed. There were 20 (44%) men and 25 (56%) women (mean age ± SD = 31.82 ± 9.76; mean years of education ± SD = 10.87 ± 3.46).

Table I shows the mean scores and the standard deviations of the sample according to the MCMI-III personality scales and clinical syndromes. Moreover, Table I shows that BR scores greater than 74 indicate that anxiety clinical syndrome is likely to be present (BR = 87). This is in line with the selected population. Also dysthymia clinical syndrome and avoidant, depressive, passive aggressive and dependent clinical personality patterns are highly represented. Severe personality pathologies (i.e. Schizotypal, Borderline and Paranoid) are not frequent.

Mean scores of the NS and BIS scales and standard deviations are shown in Table II.

Table III shows the correlations between MCMI-III Basic personality scales, BIS-11 and NS scales. All the BIS scores negatively correlate with the Compulsive personality style. Attentional Impulsiveness (AI) correlate with Schizoid, Depressive, Histrionic, Passive-Aggressive patterns. Severe personality pathologies (i.e. Borderline and Schizotypal) strongly correlate with BIS-scores. As expected, NS scores show a negative correlation with Compulsive scale and a positive correlation with Antisocial, Aggressive, Schizotypal and Borderline scales.

Table IV shows the correlations between MCMI-III Clinical syndromes, BIS-11 and Novelty Seeking scales. Attentional Impulsiveness (AI) highly correlate with Somatoform and Dysthymia Millon's scales while Attentional and Motor Impulsiveness do so for Bipolar-Manic Millon's scale. Among the severe syndromes, only two of the three scales (i.e. Thought Disorder and Major Depression) positively correlate with Attentional and Motor Impulsiveness. Furthermore, NS scores positively correlate with bipolar-manic, Alcohol dependence and Drug dependence scales.

TABLE II.
Novelty Seeking and Barratt Impulsiveness Scale (BIS) mean scores and standard deviations (SD) (n = 45).
Punteggi medi e deviazioni standard (DS) alla Novelty Seeking e alla Barratt Impulsiveness Scale (BIS) (n = 45).

Scale	Mean	SD
Novelty seeking Tot (NS)	44.77	18.33
Exploratory excitability (NS1)	48.63	22.98
Impulsiveness (NS2)	40.45	24.96
Extravagance (NS3)	46.36	28.53
Barratt impulsiveness Tot (BIS-11)	64.78	11.93
Attentional impulsiveness (AI)	16.51	4.53
Motor impulsiveness (MI)	21.58	5.21
Non Planning impulsiveness (NP)	26.69	5.21

Discussion

Impulsiveness in anxiety disorders is distinctly at odds with widely held conceptualisations of this cluster of disorders. Some shared features in anxiety disorders such as harm avoidance, anxious apprehension, and worry are not consistent with conventional views of the impulsive profile [19 20], commonly entailing a decreased anticipation of the consequences of one behaviour and increased risk-seeking [21]. Therefore, impulsiveness and anxiety are at opposite ends of a continuum. Specifically, impulsiveness occurs when anxiety is low; on the other side, high levels of anxiety inhibit impulse [22]. However, in a classical paper reviewing the relationship between impulsivity and other mental disorders Dolan et al. point out that impulsivity and aggression were related to higher, rather than lower, anxiety [23]. A strong relationship between impulsivity and anxiety are also reported along several lines of evidence (i.e. familiar, pharmacological and psychobiological) [22 23].

Our findings in a clinical sample with anxiety disorders suggest that a dimension of 'impulsivity' is more prominent in some personality styles and clinical syndromes assessed by MCM-III.

In line with a previous report [24], an high percentage of our sample showed Avoidant, Depressive and Dependent clinical personality patterns. Specific studies in the literature have most frequently surveyed Axis II personality disorders (PD) in patients with Axis I anxiety or mood disorders and found associations with cluster C PD, particularly avoidant and dependent personality disorders [25 26].

Most of the correlations with the Millon's Personality scales are explained by attentional (i.e. cognitive) impulsiveness. Its subscale items (e.g. "I concentrate easily", "I often have extraneous thoughts while thinking") reflect distractibility, attentional

TABLE III.
Correlations (Pearson's r) between MCMI-III, Basic personality scales, BIS-11 and Novelty Seeking scales. *Correlazioni (r di Pearson) tra le scale di personalità del MCMII, la BIS-11 e la Novelty Seeking.*

	Barratt Impulsiveness Scale (BIS)				Novelty Seeking (NS)				
Scale	**BIS tot**	**Attentional impulsiveness (AI)**	**Motor impulsiveness (MI)**	**Non planning (NP)**	**NS tot**	**Exploratory excitability (NS1)**	**Impulsiveness (NS2)**	**Extravagance (NS3)**	**Disorderliness (NS4)**
Clinical personality patterns									
Schizoid	…	0.46	…	…	…	…	…	…	…
Avoidant	…	…	…	…	…	…	…	…	0.38
Depressive	…	0.44	…	…	…	…	…	…	…
Dependent	…	…	…	…	…	…	…	…	…
Histrionic	-0.35	-0.44	…	…	…	…	…	…	…
Narcissistic	…	…	…	…	…	…	…	…	…
Antisocial	…	…	…	…	0.47	…	0.45	…	0.43
Aggressive	0.35	…	…	…	…	…	0.40	…	…
Compulsive	-0.59	-0.47	-0.54	-0.40	-0.41	…	…	…	-0.49
Passive-aggressive	…	0.35	…	…	…	…	…	…	…
Self-defeating	…	0.41	…	…	…	…	…	…	…
Severe personality pathology									
Schizotypal	0.40	0.45	…	…	…	…	0.37	…	…
Borderline	0.45	0.49	0.45	…	0.43	…	0.40	…	0.42
Paranoid	…	…	…	…	…	…	…	…	…

Only correlations with $p < 0.01$ are reported.

TABLE IV.
Correlations (Pearson's r) between MCMI-III Clinical syndromes, BIS-11 and Novelty Seeking scales. *Correlazioni (r di Pearson) tra le sindromi cliniche del MCMII, la BIS-11 e la Novelty Seeking.*

	Barratt Impulsiveness Scale (BIS)					Novelty Seeking (NS)			
Scale	**BIS tot**	**Attentional impulsiveness (AI)**	**Motor impulsiveness (MI)**	**Non planning (NP)**	**NS tot**	**Exploratory excitability (NS1)**	**Impulsiveness (NS2)**	**Extravagance (NS3)**	**Disorderliness (NS4)**
Clinical syndromes									
Anxiety	…	…	…	…	…	…	…	…	…
Somatoform	0.41	0.51	…	…	…	…	…	…	…
Bipolar-manic	0.38	0.37	0.35	…	0.48	0.40	0.48	…	
Dysthymia	0.37	0.49	…	…	…	…	…	…	0.37
Alcohol dependence	…	…	…	…	0.44	…	0.46	…	0.47
Drug dependence	…	…	…	…	0.41	…	0.49	…	0.39
Post traumatic	…	…	…	…	…	…	…	…	…
Severe clinical syndromes									
Thought disorder	0.43	0.55	0.38	…	…	…	…	…	…
Major depression	0.43	0.57	0.37	…	…	…	…	…	…
Delusional disorder	…	…	…	…	…	…	0.39	…	…

Only correlations with $p < 0.01$ are reported.

difficulties and the awareness of uncontrollable and intrusive cognitive activity [16 21-26].

However, the anxiety disorder patients usually report ego-dystonic preoccupations and symptoms (e.g. worry) on which they have minimal control. This may be the most plausible explanation for the BIS cognitive subscale elevation in this clinical group. As a matter of fact, elevated impulsivity levels of anxiety groups, may be a consequence or concomitant of symptoms, rather than an underlying cause.

It has been reported that Borderline and Antisocial personality correlated with Temperamental Impulsivity [27 28]. These results have been confirmed in our sample. Actually, we found a significant correlation between borderline severe personality pathology and Attentional Impulsiveness as well as NS2. Antisocial clinical personality pattern is more related to Temperamental Impulsiveness (NS2-NS4). Correlations between impulsivity traits and antisocial behaviour have been reported in adolescents [29], in young offenders, and prisoners. We report similar correlations between NS2-NS4 and Drug dependence, Alcohol dependence and bipolar-manic clinical syndromes, that may be correlated to Antisocial patterns. These findings suggest a temperamental link among these syndromes [30]. Although the association between impulsivity traits and antisocial behaviour has been demonstrated with a variety of measures, it has not been always confirmed [31].

An important finding of our study is the detection of negative correlation between impulsiveness and compulsivity. Previous studies found that statistically significant differences in Millon Personality Patterns between two clinical samples with major depression and generalized anxiety disorder (GAD) for dependent, compulsive, self-defeating and borderline traits [32]. The Compulsivity Personality pattern was more related to GAD, than other patterns. Our results further suggest that Compulsivity is negatively related to all BIS scores and to Disorderliness.

Strack et al. found that the circular structure of the MCMI-III personality disorders scales is characterised by a vertical axis represented by Impulsivity *vs*. Compulsivity dimensions [33].

Furthermore, we found an association between Millon's schizotypal personality pathology and impulsiveness. Schizotypal severe personality pathology correlates with AI and with NS2. It appears that multidimensionality of impulsiveness involves also schizotypal dimension, but not paranoid or delusional disorders.

Chapman et al. described an Impulsive Nonconformity Scale to design impulsiveness in schizotypal patients, characterised by a failure of incorporation of societal norms, a lack of empathy for the pain of others, and an unrestrained yielding to impulse and self-gratification [34]. Daneluzzo et al. identified 'positive schizotypy', a dimension of schizotypy characterized by high NS [14]. Dinn et al. observed a positive relation between measures of temporolimbic dysfunction, impulsivity, antisocial behaviour and positive schizotypal phenomena [35].

Anxiety is likely associated with Somatoform clinical syndrome. According to Battaglia et al. somatization is related to NS [36]. Concerning their findings, patients with both somatization and Panic Disorders had significantly higher NS values on Tridimensional Personality Questionnaire (TPQ). Our results show that Somatoform clinical syndrome correlates with AI but not with NS scores.

The AI correlate with Millon's mood related symptoms (i.e., dysthymia and major depression). This finding has been recently confirmed by Corruble et al. [37].

The association between anxiety and impulsiveness is important to predict suicide and mood disorder risk factors. Askenazy et al. identified four sub-groups of adolescents with at-risk behaviour according to their level of anxiety and impulsivity: anxious and impulsive (AI), anxious and non-impulsive (Ai), impulsive and non-anxious (aI), non-impulsive non-anxious (ai) [38]. It was reported that 'AI' was highly predictive of being suicide with mood disorders, 'Ia' of being delinquent with conduct disorder, 'Ai' of being anorexic or depressed, and 'ai' of being with substance abuse associated only to impulsivity. The impulsive-anxious group (AI) appears closely related to the soft bipolar spectrum. Even though we do not explore axis I bipolar comorbidity, MCMI-III detects a 16% of bipolar manic syndrome with a mild correlation with BIS. This finding should be considered in line with other reports confirming that even in a relative non-severe outpatient anxious sample, the impulsivity is relevant and could be obscured by other 'clinical syndrome' or 'personality pattern' [8 38]. The dissection of impulsivity by using proper rating scales may help in treatment monitoring or choice.

Furthermore, impulsiveness in anxiety disorders is also important for compliance. Wingerson et al.

showed that personality traits involving impulsiveness and disorderliness may contribute to early dropouts from clinical trials, independent of side effects, lack of efficacy and significantly baseline worse symptoms of anxiety [39].

A major limitation of this study is the lack of assessment of comorbidity disorders. Because we selected a dimensional approach we do not report Axis I and II disorders so that our conclusion should be considered in the light of this limitation. However, at the same time, this is a strength of this study that allows to better explore relationship along several clinical dimensions carefully assessed with validated instruments. We are aware that self-report measures could have poor reliability [2]. However, if this could be the case of severe personality disorders or inpatients, we do not believe this applies to our clinical sample (i.e. outpatients with anxiety disorders). Nevertheless, other neurobehavioral measures could be more informative.

Finally, our study suggests that impulsiveness within the anxiety disorders is better described by dimensional instruments (i.e. TCI and MCMI) and their underlying constructs. Clinicians should pay attention to borderline and schizotypal traits, even in outpatient samples, as possible source of non compliance or other impulsiveness related issues (i.e. drug abuse or violence).

References

1. American Psychiaric Association. *Diagnostic and Statistical Manual of Mental Disorders* - 4th edn. Washington, DC: APA 1994.
2. Moeller FG, Barratt ES, Dougherty DM, Schimitz JM, Swann AC. *Psychiatric aspects of impulsivity*. Am J Psychiatry 2001;158:1783-93.
3. Barratt ES, Patton JH. Impulsivity: *Cognitive, behavioral, and psychophysiological correlates*. In: Zuckerman M, editor. *Biological basis of sensation-seeking, impulsivity, and anxiety*. Hillsdale, NJ: Lawrence Erbaulum Associates 1983, pp. 77-116.
4. Swann AC, Bjork JM, Moeller FG, Dougherty DM. *Two models of impulsivity: relationship to personality traits and psychopathology*. Biol Psychiatry 2002;51:988-94.
5. Dawe S, Loxton NJ. *The role of impulsivity in the development of substance use and eating disorders*. Neurosci Behav Rev 2004;28:343-51.
6. Cloninger CR. *A systematic method for clinical description and classification of personality variants*. Arch Gen Psychiatry 1987;44:573-588.
7. Gray JA, McNaughton N. *The neuropsychology of anxiety: an enquiry into the functions of the septo-hippocampal system*. 2nd edn. Oxford: Oxford University Press 2000.
8. McElroy SL, Hudson JI, Pope HG, Keck PE, Aizley HG. *The DSM-III-R impulse control disorders not elsewhere classified: clinical characteristics and relationship to other psychiatric disorders*. Am J Psychiatry 1992;142:318-27.
9. Summerfeldt LJ, Hood K, Antony MM, Richter MA, Swinson RP. *Impulsivity in obsessive-compulsive disorder: comparisons with other anxiety disorders and within tic-related subgroups*. Pers Indiv Diff 2004;36:539-53.
10. Summerfeldt LJ, Huta V, Swinson RP. *Personality and obsessive-compulsive disorder*. In: Swinson RP, Antony MM, Rachman S, Richter MA, editors. *Obsessive-compulsive disorder: theory, research and treatment*. New York, NY: Guilford 1998, pp. 79-119.
11. Casada JH, Roache JD. *Behavioral inhibition and activation in posttraumatic stress disorder*. J Nerv Ment Dis 2005;193:102-9.
12. Krueger RF, Piasecki TM. *Toward a dimensional and psychometrically-informed approach to conceptualizing psychopathology*. Behav Res Ther 2002;40:485-9.
13. Cloninger CR, Svrakic DM, Przybeck TR. *A psychobiological model of temperament and character*. Arch Gen Psychiatry 1993;50:975-90.
14. Daneluzzo E, Stratta P, Rossi A, *The contribution of temperament and character to schizotypy multidimensionality*. Compr Psychiatry 2005:46:50-5.
15. Millon T. *MCMI-III manual*. Minneapolis, MN: National Computer Systems 1994.
16. Patton JH, Stanford MS, Barratt ES. *Factor structure of the Barratt Impulsiveness Scale*. J Clin Psychol 1995;51:768-74.
17. Fossati A, Barratt ES, Acquarini E, Di Ceglie A. *Psychometric proprieties of an Italian version of Barratt Impulsiveness Scale-11 (BIS-11) in non clinical subjects*. J Clin Psychol 2001;57:815-28.
18. Norusis MJ. *SPSS for Windows. User's Guide Release 5.0*. Chicago, IL: SPSS Inc. 1993.
19. Brown TA.*Validity DSM-III-R and DSM-IV classiffication systems for anxiety disorders*. In: Rapee RM, editor. *Current controversies in the anxiety disorders*. New York, NY: Guilford 1996, pp. 21-5.
20. Zinbarg RE, Barlow DH. *Structure of anxiety and the anxiety disorders: a hierarchical model*. J Abnorm Psychology 1996;105:181-93.
21. Webster CD, Jackson MA. *A clinical perspective on impulsivity*. In: Webster CD, Jackson MA, editors.

Impulsivity: theory, assessment, and treatment. New York, NY: Guilford 1997, pp. 13-31.

22 Carver CS, Miller CJ. *Relations of serotonin function to personality: current views and key methodologial issue*. Psychiatr Res 2006;144:1-15.

23 Dolan MC, Anderson IM, Deakin JFW. *Relationship between 5-HT function and impulsivity and aggression in male offenders with personality disorders*. Br J Psychiatry 2001;178:352-9.

24 Oldham JM, Skodol AE, Kellman DH, Hyler SE, Doidge N, Rosnick L, et al. *Comorbidity of axis I and axis II disorders*. Am J Psychiatry 1995;152:571-8.

25 Mauri M, Sarno N, Rossi VM, Armani A, Zambotto S, Cassano GB, et al. *Personality disorders associated with generalized anxiety, panic, and recurrent depressive disorders*. J Pers Disord 1992;6:162-7.

26 Barratt ES. *Impulsiveness subtraits: arousal and information processing*. In: Spence JT, Izard CE, editors. *Motivation, emotion and personality*. North Holland: Elsevier Science 1985, pp. 137-46.

27 Links PS, Heslegrave R, van Reekum R. *Impulsivity: core aspect of borderline personality disorder*. J Pers Disord 1999;13:1-9.

28 Stein DJ, Hollander E. *Impulsive aggression and obsessive-compulsive disorder*. Psychiatry Ann 1993;23: 389-95.

29 Luengo MA, Carrillo-de-la-Pena MT, Otero JM, Romero E. *A short-term longitudinal study of impulsivity and antisocial behaviour*. J Pers Soc Psychology 1994;66:542-8.

30 Karam EG, Yabroundi PF, Melhem NM. *Comorbidity of substance abuse and other psychiatric disorders in acute general psychiatric admission: a study from Lebanon*. Compr Psychiatry 2002;43:463-8.

31 Barratt ES. *Time perception, cortical evoked potential, and impulsivenes among three groups of adolescents*. In: Hays JR, Roberts TK, Solvay S, editors. *Violence and the violent individual*. New York: SP Medical and Scientific Books 1993, pp. 87-95.

32 Freeman AM, Kalinberg AS, Rolland PD, Brannon GE. *Millon multiaxial personality patterns differentiate depressed and anxious outpatients*. Depress Anxiety 1999;10:73-6.

33 Strack S, Choca J, Gurtman MB. *Circular Structure of the MCMI-III personality disorder scales*. J Pers Dis 2001;15:263-74.

34 Chapman LJ, Chapman JP, Numbers JS, Edell WS, Carpenter BN, Beckfield D. *Impulsive nonconformity scale as a trait contributing to the prediction of psychotic-like and schizotypal symptoms*. J Nerv Ment Dis 1984;172:681-91.

35 Dinn WM, Harris CL, Aycicegi A, Greene P, Andover MS. *Positive and negative schizotypy in a student sample: neurocognitive and clinical correlates*. Schizophr Res 2002;56:171-85.

36 Battaglia M, Bertella M, Bajo S, Politi E, Bellodi L. *An investigation of the co-occurence of panic and somatization disorders trough temperamental variables*. Psychosom Med 1998;60:726-9.

37 Corruble E, Benyamina A, Bayle F, Falissard B, Hardy P. *Understanding impulsivity in severe depression? A psychometrical contribution*. Prog Neuropsychopharmacol Biol Psychiatry 2003;27:829-33.

38 Askenazy FL, Sorci K, Benoit M, Lestideau K, Myquel M, Lecrubier Y. *Anxiety and impulsivity levels identify relevant subtypes in adolescents with at-risk behaviour*. J Affect Disord 2003;74:219-27.

39 Wingerson D, Sullivan M, Dager S, Flick S, Dunner, Roy-Byrne P. *Personality traits and early discontinuation from clinical trials in anxious patients*. J Clin Psychopharmacology 1993;13:194-7.