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Proposal of a dimensional model of personality disorders

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During recent years there has been a growing interest on several aspects regarding psychopathology in general and particularly with personality disorders, such as dual psychopathology, comorbidity and dimensional models. Going from the Eysenck's three-factor model to the Fiske's five-factor one, from the Cloninger's psychobiological model to the Millon's biosocial one, a wide variety of personality analysis models, as well as dimensions to which the different personality disorders should be anchored, have been proposed.

Here, we propose a dimensional model for personality disorders based on DSM-IV criteria, which are cognitive style (field dependence-independence), prevalent emotion (anger-fear), interpersonal style (submissiveness-dominance), and impulse control (impulsiveness-compulsiveness). We consider that these dimensions are related to different levels of cerebral complexity, assuming that evolution operates under the redundancy principle. Based on these dimensions, a bimodal model in which antisocial personality (high field dependence, anger, dominance, and impulsiveness) and schizotypal personality (low field dependence, fear, submissiveness, and compulsiveness) would be anchored in each extreme is proposed. Between these two extremes, the rest of personality disorders, such as borderline, paranoid, narcissist, histrionic, dependent, passive-aggressive, avoidant, obsessive-compulsive, paranoid, and schizoid, would be anchored.

Key words:
Personality disorders. Comorbidity. Dimensional models. Cognitive styles. Emotions. Interpersonal relationships. Impulse control.

Actas Esp Psiquiatr 2005;33(4):254-262

Propuesta de un modelo dimensional para los trastornos de personalidad

En los últimos años asistimos a un emergente interés por aspectos relacionados con la psicopatología en general y con los trastornos de personalidad en particular como son las patologías duales, la comorbilidad y los modelos dimensionales. Desde el modelo de tres factores de Eysenck hasta el de los cinco factores de Fiske, del modelo psicobiológico de Cloninger al modelo biosocial de Millon son múltiples los modelos de análisis de la personalidad que se han propuesto, así como las dimensiones sobre las que anclar los diferentes trastornos de la personalidad.

En este trabajo se propone un modelo dimensional para los trastornos de la personalidad basándonos en los criterios del DSM-IV, es decir, en las dimensiones estilo cognitivo (dependencia-independencia de campo), emoción prevalente (ira-miedo), estilo interpersonal (sumisión-dominancia) y control de los impulsos (impulsión-compulsión). Consideramos que estas dimensiones se relacionan con diferentes niveles de complejidad cerebral partiendo del hecho de que la evolución opera desde el principio de la redundancia. Desde estas dimensiones se propone un modelo con un eje bimodal en cuyos extremos se hallan la personalidad antisocial (alta dependencia de campo, ira, impulsividad y dominancia) y la esquizotipia (baja dependencia de campo, miedo, compulsividad y sumisión). Entre estos extremos se hallarían la personalidad límite, paranoide, narcisista, histriónica, dependiente, pasivo-agresiva, dependiente, evitativa, obsesivo-compulsiva, paranoide y esquizoide.

Palabras clave:
Trastornos de personalidad. Comorbilidad. Modelos dimensionales. Estilos cognitivos. Emociones. Relaciones interpersonales. Control de impulsos.

INTRODUCTION

After the emerging interest in dual diagnoses in recent years, abundant investigations focused on two fundamental aspects of comorbidity have developed. On the one hand, many studies have been published on comorbidity among the Axis I disorders and, on the other, between these and the Axis II disorders. Co-occurrence between different disorders is a phenomenon provoking increasingly more attention by the investigators and clinicians due to its important implications for nosology, psychopathological models and treatment.

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However, the limited number of studies that have focused on comorbidity between personality disorders is paradoxical. This may be related with several factors: *a)* DSM and ICD diagnostic criteria require better explanation; *b)* discrepancies between DSM and ICD criteria for personality disorders (see table); *c)* clinicians and investigators tend to focus on a single Axis I disorder that arises their interest; *d)* clinicians and investigators tend to focus on a single Axis II disorder that catches their interest; *e)* in the clinical practice, there is a tendency to excluding diagnoses in each Axis; *f)* the present hypothesis on the adequate approach to psychopathology based on dimensional criteria has still not made an impression on the professionals; *g)* reliability to establish Axis I-Axis I and Axis I-Axis II comorbidity is higher than between Axis II-Axis II, y *h)* pharmaceutical companies are more interested in Axis I-Axis I and Axis I-Axis II comorbidity because the psychodrugs have been shown to be more effective to affect the symptoms related with Axis I (table 1).

In fact, when an attempt is made to establish comorbidity between the different personality disorders, it is interesting that both the DSM-IV[1] and Millon model[2] seem to be based on «intuition» (balance between knowledge and experience of the person elaborating it), there being no bibliographic review that can support their statements (although we do not doubt them) (table 2). Thus, the DSM-IV classifies them into three groups (see table 3), based on the «similarities of their characteristics», indicating that this grouping system, although it may be useful for research and teaching effects, has important limitations and has not been validated consistently.

Stating that the diagnosis used in these manuals represents the categorial perspective, according to which personality disorders are qualitatively differentiated clinical realities, is not new, although it is important. In fact, this categorial perspective is not accepted by almost anyone in the debate forums, although we cannot «become separated» from them in the daily clinical practice. The alternative proposed for this categorial approach is the dimensional perspective according to which the personality disorders represent maladaptive variants of the personality traits that imperceptibly sink their roots into normality and are intermixed. The problem of dimensionality is presently focused on the lack of agreement on how many dimensions exist in both normal personality and in the disease as well as how we should place the disorders into each one of the dimensions. This leads us to hypothesize the need for an agreement on «dimensional minimums» in which the different personality disorders can be anchored.

Table 1 Diagnostic criteria for personality disorders

DSM III-R	ICD 10	DSM IV
Paranoid	Paranoid	Paranoid
Schizoid	Schizoid	Schizoid
Schizotypal		Schizotypal
Antisocial	Dissocial	Antisocial
Borderline	Emotional instability	Borderline
Histrionic	Histrionic	Histrionic
Narcissistic		Narcissistic
Avoidant	Anxious (avoidant)	Avoidant
Dependent	Dependent	Dependent
Obsessive-compulsive	Anancastic	Obsessive-compulsive
Passive-aggressive		

This rebirth of dimensionality seems to be due to a series of reasons, among them the following: *a)* comorbidity has become a rule and not an exception in the present psychiatric diagnoses[3]; *b)* genetic studies of vulnerability show familial aggregation of disorders of different type, indicating that this inherited vulnerability is for a certain «spectrum» of disorders and not for a certain one, and *c)* the neurobiological investigation points towards the presence of similar disorders in neurotransmission in a wide range of disorders.

Although many dimensions have been proposed, we consider it adequate to reach this agreement of minimums, establishing it on the general diagnostic criteria for DSM-IV personality disorder, since we must not forget that these manuals, although they have significant limitations, have decisively served to enable the clinicians to speak a common language. Thus, this manual states that a personality disorder is an enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture and that is manifested in two or more of the following areas: *a)* cognition; *b)* emotional response; *c)* interpersonal activity, and *d)* impulse control[1].

On the other hand, overlapping between the different personality disorders is very high, partially due to the fact that some diagnostic criteria are «duplicated» in several disorders (for example, social withdrawal in avoiders, paranoids, schizoids and schizotypal subjects or violent behaviors in the antisocial and borderline subjects). This may be indicating the dimensional character itself of these disorders where some nuclear traits are shared[4]. In the same way, this indicates that there are important limitations to diagnose and to investigate the etiology of the different disorders, since the entities are not well defined and thus, their diagnostic specificity and the guidelines for their evaluation and treatment are far from being adequate at present.

In this sense, it is adequate to hypothesize from the brain-mind relationship, if the diagnostic criteria for the personality disorders really respond to differentiated biological «realities» or rather to a shift in a continuum, which would favor the dimensional analyses. Another relevant feature that is favored by the dimensional analysis is the capacity that this type of analysis has to predict the course of a disorder and, perhaps, to suggest an adequate intervention since the interventions may shift the individual on the

Table 2 Comorbidity between personality disorders according to Millon and differential diagnosis according to DSM-IV

	Avoidant	Dependent	Histrionic	Narcissistic	Antisocial	Compulsive	Schizotypal	Borderline	Paranoid
Schizoid	X0	X				X0	X0		X0
Avoidant		X0				0	X	X	X
Dependent			X0			X0		X0	
Histrionic				X0	X0			X0	X0
Narcissistic					X0			0	X
Antisocial								X0	X0
Compulsive									X
Schizotypal								0	0
Borderline									0
Paranoid									

X: comorbidity between personality disorders according to Millon. 0: differential diagnosis to be established between personality disorders according to DSM-IV.

continuum, «taking him/her» towards a less serious disorder (the therapeutic intervention should not be understood from this all or none dichotomy).

COMORBIDITY STUDIES

In an attempt to establish a dimensional model of the personality disorders, we have decided to review the principal studies performed on comorbidity between axis II disorders and the existing studies that try to establish comorbidity between a specific disorder of the personality with other Axis II disorders (table 4).

The results of this review are summarized in the table and show the following generic results:

- There is high comorbidity among narcissistic, histrionic, borderline, antisocial, dependent and paranoid disorders.
- There is high comorbidity among dependent, avoidant, obsessive-compulsive, paranoid, schizoid and schizotypal disorders.
- The lowest comorbidity is presented between antisocial and borderline with schizoid and schizotypal.
- Paranoid and dependent personality disorder are those shared by both comorbidity groups, so that it can be deduced that, when beginning from the center of a bimodal axis, these disorders are «replicated» in each dimension of the axis.

Table 3 Personality disorder cluster according to DSM-IV

Group A	Paranoid
	Schizoid
	Schizotypal
Group B	Antisocial
	Borderline
	Histrionic
	Narcissistic
Group C	Avoidant
	Dependent
	Obsessive-compulsive

DIMENSIONAL MODEL

Going from the Eysenck three factors model[24,25] to that of the Fisk five factors one[26,27], from the Cloninger psychobiological model[28,29] to the Millon biosocial model[2], there are many models of personality analysis that have been proposed as well as the dimensions on which the different personality disorders are anchored.

Following the criterion of the «areas» of inner experience and behavior in which a personality disorder is formed, shaped and manifested according to the DSM-IV, we can suggest a dimension in each area on which a dimensional analysis of the disorders can be anchored, following the previous suggested «minimum criterion».

Cognitive style: field dependence-independence

This dimension has been studied most and validated and its background is found in the study of perception and specifically in trying to answer the following question: how do we know that our body or another object is in the vertical position?[30]. Based on a series of tasks designed for this, it

Table 4 Principal studies of comorbidity among personality disorders

Author	Subjects	Criteria	Results
Dolan et al., 1995[5]	275 PD	PDQ-R	PD-borderline more prevalent and OCD-P less prevalent
	57 delinquents		Deliquents more antisocial and less dependent
	274 students		Students more paranoid and less schizoid
DeJong et al., 1993[6]	178 alcoholics	DSM-III (SIDP)	Histrionic-borderline
			Histrionic-antisocial
			Dependent-passive aggressive
Grilo et al., 2002[7]	108 out-patients with bordeline disorders	DSM-IV (DIPD-IV)	Borderline-antisocial
			Borderline-avoidant
Zanarini et al., 1998[8]	504 hospitalized patients with PD diagnosis	DSM III-R (DIPD-R)	Borderline-dependent
		DIB-R	Borderline-avoidant
			Borderline-paranoid
Zlotinck et al., 2002[9]	130 borderline patients	DSM-IV	Borderline-antisocial
Oldham et al., 1992[10]	100 patients with TP	DSM-III-R (SCID-II)	Narcissistic-antisocial
			Histrionic-passive aggressive
			Avoidant-schizotypal-dependent
			Borderline-histrionic
Zimmerman and Coryell 1989[11]	797 subjects without psychiatric disease	DSM-II (SIPD)	Schizotypal-avoidant
			Schizotypal-paranoid
			Histrionic-paranoid
			Borderline-histrionic-antisocial-paranoid
Numberg et al., 1991[12]	110 patients	DSM-III-R	Borderline-paranoid-antisocial-histrionic-narcissistic-passive aggressive
			Schizoid-schizotypal-avoidant-obsessive-compulsive
Coid, 1993	93 jailed women with psychopathy diagnosis	DSM-III (SCID)	Antisocial-borderline
Bejerot and Von Knorring, 1998[14]	36 patients with OCD	DSM-III-R	Obsessive-compulsive-avoidant-paranoid
Becker et al., 2000[15]	68 adolescents 50 adults with borderline disorder	DSM-III-R	In adolescents with all and in adults between borderline histrionic, antisocial and narcissistic
Stuart et al., 1998[16]	1.116 subjets	DSM-III-R	Avoidant-paranoid-schizoid-schizotypal
			Avoidant-dependent-obsessive-compulsive
			Narcissistic-borderline-histrionic
Fosati et al., 2000[17]	431 PD	DSM-IV (SCID-II)	Avoidant-dependent
			Paranoid-schizoid-schizotypal
			Histrionic-narcissistic-borderline-antisocial
Reich, 1996	171 out-patients	DSM-III-R	Dependent-borderline-histrionic
Widiger and Rogers, 1989[19]	568 out-patients and hospitalized patients	DSM-III	Borderline-antisocial
			Borderline-histrionic
			Borderline-schizotypal
			Avoidant-dependent-schizotypal
			Avoidant-passive aggressive
Marinangeli et al., 2000[20]	156 hospitalized patients	DSM-III-R	Paranoid-borderline
			Schizoid-schizotypal
			Obsessive-compulsive
			Antisocial-histrionic
Watson and Sinha, 1998[21]	1,729 psychology students	DSM-III-R	Schizotypal-paranoid
			Schizotypal-passive aggressive
			Narcissistic-histrionic-passive aggressive
Trull et al., 1987[22]	84 hospitalized patients	DSM-III	Avoidant-schizoid-dependent
Flick et al., 1993[23]	352 patients with anxious depressive disorder	DSM-III-R	Borderline-paranoid
			Borderline-histrionic
			Paranoid-narcissistic
			Avoidant-histrionic
			Paranoid-passive aggressive
			Narcissistic-passive aggressive

TD: personality disorders.

was verified that while some subjects were guided by their perceptive opinions based on external data, others were guided from internal references. That is, the former had a cognitive style highly dependent on the field and the latter would be more independent of the context. In short, the dimension reflects the degree in which persons function autonomously and independently of the world around them. Those individuals who use their signs or inner reference systems to process the information provided by the stimuli are in one extreme of the dimension (field independence). Those subjects who base their information processing on the external signs of reference are on the other extreme (field dependence).

On the other hand, the information from clinical neuropsychology tells us about a group of patients who suffer an organic syndrome of the personality after a frontal injury, that is, after a lesion of the prefrontal cortex there is a change in the pattern of interaction with the environment[31-33]. This pattern of interaction with the environment has been called pseudopsychopathic syndrome and/or pseudodepressive syndrome, according to whether there is an uninhibited behavior or apathic pattern. What is important about this is that the personality would be shaped in the prefrontal cortex and that the lesion of this cortical region produces changes with high or low field dependence. In fact, some authors such as Goldberg[34,35] have recently studied the cognitive styles of both brain hemispheres, establishing the differentiation between high and low dependence of the context as a fundamental variable explaining the different cognitive styles.

Emotional response: anger-fear

There are many studies that have been carried out in differential psychology on cognitive styles and the relationship between these styles and personality characteristics. However, there are few studies on the emotions underlying this «consistent» manner of interacting with the world. This seems to be due to aspects that would merit much thought, but that go from «escape» from the emotional carried out by cognitive psychology to become distant from the psychodynamic trend to the difficulties of «measurement» of the emotions, even passing through a lack of consensus among the different authors when describing the different emotions[36].

Clearly, emotions are phylogenetically and ontogenically older so that it is difficult to imagine a personality development outside them and we should think that the cognitive styles are constructed and based on prevalent emotional responses to stimuli. It may be that cognitions act on a first level of the work but emotions work behind the senses, continuously orienting thoughts. Thus, emotions should be understood as internal signs that direct our survival, physiological states designed by natural selection, having a rapid and adaptive action that seeks to connect our biological nature with the external world in which it is immersed. Thus, fear advises us of danger, repugnance distances us from the putrid and sadness indicates that we have lost status in our clan[37].

If we follow the criterion of «minimums» that we suggested in the beginning, it seems there are five basic emotions that are shared with other hominids and by human beings universally: happiness, sadness, anger, repugnance and fear. As we see, this is a single «positive» emotion (although all are positive when adaptive), which suggests that the differences should occur between the negative ones. Among these, we chose the dimension anger-fear because it responds to the fundamental pattern of exploratory-escape behavior and some studies state that there are emotions that seem to be closer to each other[38].

Interpersonal relationships: submissiveness-dominance

The so-called «interpersonal circle» is a useful outline to establish interpersonal styles. The two polar dimensions are given on certain characteristics: the degree of power or of control exerted on the social interactions gives rise to the submissiveness-dominance dimension. It seems that there is a lot of evidence on these two large archetypal systems of interpersonal relationships. The first would be more related with a more submissive behavior and would be related with concepts such as bond, affiliation, care of the other, fear or altruism. The second archetypal system refers to the relationships based on dominance and would be linked to other concepts such as territoriality, range, possession, anger or power[39].

The interpersonal style in personality disorders is characterized by being inflexible. Interpersonal skills are shown throughout the dimension, indicating different adaptive skills, those that crystallize during development, adopting a definite style in adulthood. As a style becomes more extreme or narrow, it has less flexibility. Someone with an extremely dominant style would have interactions especially in this style. This type of person may also demonstrate coercive and gregarious characteristics, but no submissiveness or docile behaviors. In any event, the behaviors will tend to be rigid and inflexible.

This notion of inflexible interpersonal styles is coherent with that of personality disorders, characterized by also inflexible traits. Because many authors have reported personality disorders as being seen through interpersonal relationships, this circumflex model has been proposed to describe and classify them. Thus, over the dominance-submissiveness axis, complementariness is reciprocal (a dominant action causes a submissive response).

When describing the dysfunction interpersonal style, it is suggested that these interactions may create strong expec-

tations on how the other will react to oneself, and that these biased expectations then become self-fulfilling prophecies. Those theorizing on attachment have reached similar conclusions[40]. Behavior is aimed at another to cause a certain reaction to appear and to fulfill expectations. For example, a hostile person expects hostile reactions from the others and behaves in such a way as to produce them. People with strong expectations will more likely generate situations that leave few different alternatives of reaction. Thus, extreme interpersonal styles are associated to a certain type of expectations. For example, dominant style would be associated to expectations of both dominance and submission of the other, and lack of skill to provoke other behaviors.

Impulse control: impulsiveness-compulsiveness

In Cloninger's temperament tetradimensional model, the author presents a temperament architecture based on dimensions of risk avoidance, reward dependence, persistence and novelty seeking. The novelty seeking dimension implies behavioral activation stimulated by stimuli of the environment characterized as novelty or reward or relief from suffering. Risk avoidance implies behavioral inhibition that occurs in response to signals having punitive character or absence of reward. In turn, reward dependence indicates the level of capacity to maintain a behavior without receiving a reward. The impulsiveness-compulsiveness connection arises in this trend or Kuhnian paradigm.

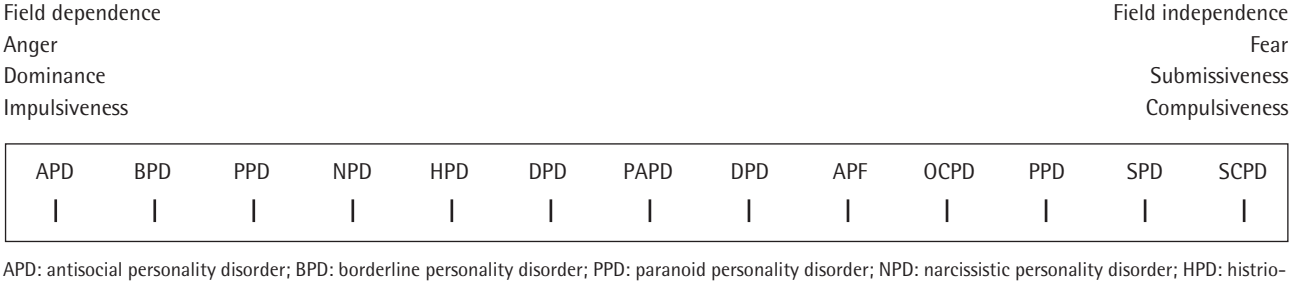
In fact, Hollander and Stein[41] presented the idea of impulsiveness-compulsiveness as the extremes of a continuum that went from disinhibition to behavior restriction, both being characterized by incapacity to inhibit stereotyped behaviors. In this way, impulsiveness and compulsiveness become two poles on a continuum. In the impulsiveness extreme, we find personalities characterized by a search for immediate pleasure, underestimation of harm, persistent contact with risk, locus of external control, low behavioral persistence and hypersensitivity to external reward. In the compulsiveness extreme, personalities were found that tend to avoid suffering, overestimate harm, try to avoid any dangerous situation, have highly persistent behaviors in highly predictable settings, represent low response to external reward and its control locus is internal[42].

Based on the results found in our search, we propose a bimodal axis to locate the personality disorders based on the previously mentioned dimensions (fig. 1).

DISCUSSION

From DSM-I to DSM-IV, the personality disorders may be the area that has provoked more controversy. Some discussions have been focused on the exclusion or inclusion of some disorders, but in the background of this debate, there are three underlying basic problems such as the definition itself of personality, low reliability of the axis II diagnoses and high overlapping between the different disorders, above all those that are included in the same DSM-IV cluster. At present, some proposals to improve the present classification systems of personality disorders are beginning to emerge. These are, for example, the need to reduce the number of categories, identify and homogenize the latent dimensions in each category, strictly define the criteria of these dimensions, determine the dimensions or basic traits capable of describing the personality disorders or include the motivation of the behaviors defined as criteria.

On the other hand, the psychopathology classification systems have tried to emulate other disciplines of medicine, using categorial constructs that aim to establish an equation that is difficult to support when we approach the study of personality disorders such as that a disorder responds to a neurochemical alteration and thus will revert when an adequate psychopharmacological treatment is applied. What is even more difficult to propose in neuroscience is the reversibility of the equation, stating that if a psychopharmacological treatment is effective, the neurochemical etiology of that disorder is demonstrated and that a pathological cerebral state has returned to a previous state. In fact, we must recognize that we still have not found any drugs that help us to «cure», or even in many cases to alleviate, the suffering that these patients have or their lack of capacity to consider the suffering that they cause others.



APD: antisocial personality disorder; BPD: borderline personality disorder; PPD: paranoid personality disorder; NPD: narcissistic personality disorder; HPD: histrionic personality disorder; DPD: dependent personality disorder; PAPD: passive aggressive personality disorder; APF: avoidant personality disorder; OCPD: obsessive-compulsive personality disorder; SPD: schizoid personality disorder; SCPD: shizotypal personality disorder.

Figure 1 *Dimensional model for personality disorders.*

We should suggest that trying to establish a relationship between neurobiology and personality disorders may lead us to a «greedy reductionism» in which the reduction of a complex reality to simple realities distances us from the understanding of the global phenomenon[43,44]. Thus, these categorial systems try to potentiate the differential diagnosis to attempt to decrease the overlapping between disorders to a minimum as if each disorder of the personality would respond to a differentiated biological phenotype. As Mayr states[45]: «on the molecular level, all the functions are due to physics and chemical laws..... However, bodies are fundamentally different from inert material. They are hierarchically ordered systems, with many emerging properties that are not observed in inanimated matter».

As an alternative to these categorial analyses of the personality disorders, the dimensional models arising from the following premise have been proposed: *a)* personality disorders sink their roots into the normal personality, representing maladaptive variants of it, and *b)* personality disorders are intermixed. From this perspective, the DSM-IV proposes three personality disorder groups (rare-eccentric, dramatic-emotional and anxious-fearful) that may be considered dimensions and that seek to represent the dysfunctions of personality in a continuum with the Axis I mental disorders. Although this dimensional proposal is more adequate than the categorial one, it does not explain how the personality disorders of the different clusters are related, so that we are immersed in a new categorial problem, although with extended categories.

On the other hand, the comorbidity concept, bond to that of dimensionality, is gathering increasingly greater importance in the present psychopathology. In the beginning, comorbidity refers to two or more disorders of different etiology that coexist or occur simultaneously. However, when it is linked to the concept of dimensionality, this first term becomes more adaptable and thus comorbidity suggests a possible closeness or proximity among the disorders from the premise that «that which is seen as united should belong to the same system and come from not very differentiated origins». In this sense, comorbidity should be understood as an attempt to go from the categorial to dimension, since stating that an individual has several personality disorders means accepting the limitation of the categorial models. Thus, comorbidity should have a double reading. On the one hand, it informs us about the proximity between certain disorders that are classified according to a categorial criterion and, on the other, and what is perhaps more important, it acquires knowledge on which disorders are most distanced in a dimensional analysis.

In this study, and beginning with the models based on dimensionality and on comorbidity studies, a bimodal axis is proposed for the personality disorders, based on the DSM-IV criteria, that is, on the cognitive style (field dependence-independence), prevalent emotion (anger-fear), interpersonal style (submissiveness-dominance) and impulse control (impulsiveness-compulsiveness) dimensions. We consider that these dimensions suggest different cerebral complexity levels, beginning with the fact that the evolution operates from the principle of redundancy. That is, the nervous system does not invent original designs but rather adds other progressively more complex ones to old structures, preserving their function.

In fact, it seems quite plausible that a primary emotion as anger or fear would produce behavior exploratory or escape patterns, respectively. Individuals who respond to an anger-exploratory pattern will show a tendency to impulsiveness while those with a fearful-avoidance one will produce compulsive patterns. In this way, the «impulsive-explorers» require a pattern of interpersonal relationships based on the need for control while the fearful-avoidance subjects will tend toward submissiveness. Finally an impulsive-dominant explorer will have a high field dependence because his/her behavior will be very mediated by a locus of external control while the fearful-avoidant-submissive subject will show a low level of field dependence due to presenting a locus of internal control.

From these dimensions, a dimensional model is suggested for personality disorders, placing them in a bimodal axis whose extremes are antisocial personality (high field dependence, anger, impulsiveness and dominance) and schizotypal personality (low field dependence, fear, compulsiveness and submissiveness). Borderline, paranoid, narcissistic, histrionic, dependent, passive-aggressive, dependent, avoidant, obsessive-compulsive, paranoid, schizoid and schizotypal personality are found among these extremes. Comorbidity studies suggest that dependent and paranoid disorder is duplicated on the axis, although some would respond to the aggressive-enraged pattern and others to the passive-fearful one in the line of attempting to define the motivation of the behaviors defined as criteria.

As San Juan and Moltó point out[46], conceptualization of personality as stable guidelines of reaction is greatly related with certain determinism since the experiences introduced into our brain are indelible, so that we could introduce new experiences, but not substitute the past ones. Our way of processing stimuli or of reacting to environment situations is closely related with an internal state that is a product of the internal activity of the brain.

Attempts to build a bridge between levels of analysis between neuroscience and psychology and psychiatry have contributed interesting results in the study of aspects such as intelligence[47] (bond to the concept of executive functions) or consciousness. However, it seems that personality has remained outside the search for this translating code, which should lead us to suggest the relationship between personality and consciousness.

Thus, Damasio[48,49] has proposed a hypothesis on consciousness that may be related with the personality concept.

This has also been done by Edelman and Tononi[50] with their concepts of primary consciousness and superior order. In the case of Damasio, three levels of complexity of consciousness are indicated: the first called protoself in which a series of CNS structures (brain stem, hypothalamus, insula, S2 cortex and middle parietal) monitor the body status moment by moment. The following level is that called central consciousness where other cerebral structures such as the superior colliculus, thalamus and cingulate register the body status on encountering an object, the characteristics of it and the changes produced as a result of the encounter. Finally, extended or widened consciousness (subcortical nuclei, temporal and frontal superior cortex) is the result of the activation of our memory produced by the encounter with the object, which allows the spouting of the biographic identity and the continuity in time of the consciousness.

Neuroscience should open new roads to the study of the personality since when we refer to it as persistent patterns of perceiving, relating and thinking about the surrounding and oneself, the concept approaches that of consciousness. If we suggest that the brain deals with the inanimate world, the other and my own experiences as objects generating «pulses of consciousness», the sum of this pulsatile activity (in the sense of the Llinas quantum of knowledge[51]) generates predominant patterns of connection, which will give rise to this persistent pattern of relationship with myself and the surrounding world.

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