Profiles of drug addicts in relation to personality variables and disorders

Perfiles de drogodependientes en relación con variables y trastornos de personalidad

María Carou*; Estrella Romero**; Mª Ángeles Luengo**

*Unidad Municipal de Atención a Drogodependientes (UMAD), Ayuntamiento de Santiago de Compostela (Municipal Centre for Attention to Drug Addicts, Santiago de Compostela City Council); **Facultad de Psicología, Universidad de Santiago de Compostela, USC (Psychology Faculty, University of Santiago de Compostela)

Abstract

In recent decades, research has identified a set of impulsive/disinhibited personality variables closely associated with drug addiction. As well as this, disorders linked with these variables, such as ADHD and personality disorders, are being closely studied in the field of drug addiction. Although much knowledge has been accumulated about the relation of these variables and disorders taken separately, less is known about how these constructs allow identify-specific profiles within the drug dependent population to be identified. This work, on the basis of data collected on a sample of drug addicts in treatment, analyzes how impulsiveness, sensation seeking, self-control, ADHD and personality disorders contribute to identifying specific profiles of addicts. Cluster analysis allowed two profiles to be outlined according to these personality and psychopathology characteristics. Self-control, impulsiveness, impulsive and antisocial personality disorders, as well as scores in ADHD, emerge as the variables that contribute more to profile differentiation. One of these profiles (56.1% of participants) with a high disinhibition pattern, is associated with severe indicators of consumption and criminal career patterns. These results allow us to emphasize the role of personality and impulsiveness-related disorders in the identification of distinctive profiles within the addict population, and suggest the need to generate treatment strategies adapted to personal/psychopathology configurations of drug addicts.
Keywords: Personality; Impulsivity; ADHD; Personality Disorders; Addiction.

Resumen

En las últimas décadas, la investigación ha permitido identificar un conjunto de variables de personalidad impulsiva/desinhibida estrechamente asociadas a la adicción a drogas. Así mismo trastornos vinculados a estas variables, como el TDAH y los trastornos de personalidad, están siendo objeto de vigorosas líneas de trabajo en el ámbito de las drogodependencias. A pesar de que se ha acumulado mucho conocimiento sobre la relación de estas variables y trastornos, tomados aisladamente, se sabe menos acerca de cómo estos constructos permiten identificar perfiles específicos dentro de la población de drogodependientes. Este trabajo, partiendo de los datos recogidos en una muestra de drogodependientes a tratamiento, analiza cómo la impulsividad, la búsqueda de sensaciones, el autocontrol, el TDAH y los trastornos de personalidad permiten identificar tipos específicos de adictos. El análisis *cluster* permitió delimitar dos perfiles atendiendo a estas características de personalidad y psicopatológicas, destacando como variables que contribuyen a esta diferencia el autocontrol y la impulsividad, los trastornos de personalidad impulsivo y disocial, así como las puntuaciones en TDAH. Uno de esos perfiles (un 56.1% de los participantes) con un patrón personal de alta desinhibición, se asocia con indicadores de consumo y criminológicos de especial severidad. Estos resultados permiten subrayar el papel de la personalidad y de los trastornos asociados a la impulsividad en la identificación de perfiles distintivos dentro de la población de adictos, y sugieren la necesidad de generar estrategias de tratamiento ajustadas a las configuraciones personales/psicopatológicas de los drogodependientes.
Palabras clave: Personalidad; Impulsividad; TDAH; Trastornos de la Personalidad; Adicción.

Received: July 2015; Accepted: April 2016.

Send correspondence to:
María Carou. UMAD (Unidad Municipal de Atención a Drogodependientes). C/Manuel María Poeta 8. Santiago de Compostela, 15705.
E-mail: mcaroul@santiagodecompostela.gal

The growth in recent years of research within the area of psychobiological processes underlying the addictive process have highlighted the importance of personality variables of a temperamental character such as impulsiveness or sensation-seeking.

Impulsiveness has been linked to drug use and other problematic behaviours in many studies, with a diminished response inhibition capacity, difficulties for reflection and planning, and a tendency to choose minor reinforcers that are closer to hand in tasks involving delayed gratification being observed in addicts (Olmstead, 2006), as well as violent behaviours, poor behavioural regulation, and lower empathy (Romero-Martínez & Moya-Albiol, 2015). The relationship between impulsiveness and substance abuse has been shown to be a robust one in many studies, being identified as one of the variables that is most consistently linked to both early contact with substances and progression in addiction (Belin, Mar, Dalley, Robbins & Everitt, 2008; Gullo, Loxton & Dawe, 2014; Motos-Sellés, Cortés-Tomás, Giménez-Costa, & Cadaveira-Mahía, 2015; Stauzt & Cooper, 2013).

Within the action-oriented personality style of drug addicts, another relevant variable is that of sensation-seeking (Zuckerman, 1979). Sensation-seeking is considered an important predictor in the onset of drug consumption in adolescence (Luengo, Otero-López, Romero & Gómez, 1996), and, like impulsiveness, has been related to difficulties in inhibitory control (Fillmore, Ostling, Martin & Kelly, 2009) and with greater sensitivity to the effects of drugs (Nadal-Alemany, 2008).

Self-control is a construct that brings together different variables such as delayed gratification or risk-taking, among others (Romero, Gómez-Fraguela, Luengo & Sobral, 2003). Self-control has taken on special relevance in recent years in the field of deviant behaviour and the consumption of drugs, starting from Gottfredson and Hirschi's approach (1994), and stands out as one of the most consistent correlates of rule-breaking behaviors (Romero, Sobral, & Luengo, 1999), including drug-related problems (Gallupe & Baron, 2014; Romero et al., 2003) and substance use chronicity (López-Torrecillas, Peralta, Muñoz-Rivas & Godoy, 2003).

In the same way that dimensions such as impulsiveness, sensation-seeking or self-control are implicated in drug use, studies of personality and disorders have provided a body of knowledge of undoubtable value for the understanding of addictions. In recent years, much attention has been given to psychopathological entities that are closely related to these personality traits, specifically, Attention Deficit Hyperactivity Disorder (ADHD) and Personality Disorders (PD), which are now an active centre of interest within the field of addictions.

Thus, closely related to impulsiveness and the ambit of the uninhibited personality, ADHD is receiving ever more attention in the study of drug use (e.g., Wilens, 2007). Although ADHD is mainly diagnosed in children, its relevance in the case of adults is being studied increasingly (e.g., Grogan & Bramham, 2016); in some studies, it has been shown that the symptoms related to hyperactivity tend to lessen with age, with attention deficit and impulsiveness becoming more stable, and persistent symptoms after adolescence being associated with clinical and psychosocial difficulties (Romero & Alonso, 2015), including disorders related to aggressiveness, antisocial behaviours, risk-taking, traffic accidents and difficulties in carrying out day-to-day tasks, as well as psychiatric comorbidity (Ramos, Bosch, Castells, Nogueira, García & Casas, 2006). As for drug use, it has been reported that, among addicts, the prevalence of ADHD is high (Kalbag & Levin, 2005), aggravating the severity of both disorders: ADHD and addiction. Other studies have focused on addiction rates among groups of adults both with and without ADHD, and the results show a significantly higher percentage among those affected by ADHD (Biederman, Wilens, Mick, Milberger, Spencer & Faraone, 1995). It has been noted that ADHD can affect the course of substance abuse, predicting an earlier age of onset in consumption, a longer duration of the addiction, progression in the addiction and treatment failure (Schubiner et al, 2000).

PDs are also a field in which research in relation to addictions has grown exponentially in recent years (Magnavita, 2004). Thus, for example, in a meta-analysis of 16 studies of psychiatric disorder comorbidity in opiate addicts, a prevalence level of 42% is found (Frei & Rehm, 2002) among this population. Among cocaine addicts, between 47% and 97% have been found to have PDs (López & Becoña, 2006). Other studies have shown that, in general, among addicts in treatment, the prevalence of PDs varies between 44.3% (Echeburúa, de Medina & Aizpiri, 2007) and 35-73% (Verheul, 2001). Specifically, the research has shown that among substance users, the antisocial personality disorder (with figures of between 18 and 30%) and the borderline personality disorder (7-22%) are the most frequent (Verheul, van der Brink & Hartgers 1995). It has also been shown that the presence of PDs is related to greater severity in the addiction and to a higher probability of treatment interruptions (González, 2014).

In general, these different lines of research point to the importance of impulsiveness, and of the dimensions and disorders associated with it, in the understanding of drug use. Earlier research allows us to conclude that both the impulsive personality and the disorders related to lack of inhibition and self-control are key ingredients in the psychological characterisation of addicts.

Another area of interest in the study of addictions, and one that deserves to be taken further, is the development of typologies within the addict population that would allow for a better understanding of the processes that lead to addiction and therefore to improved tailoring of treatment strategies.

Employing cluster analysis techniques, Cloninger (1987) identifies two sub-types of alcohol users that are differentiated in terms of the of their onset in consumption, the heritability of addiction, risk factors in childhood, the level of severity of the dependence and psychosocial maladjustment. These typologies would correspond to others found by Babor et al. (1992) and Ball (1995). In this country, in a study of polydrug users who were in treatment (Muñoz, Nava, Graña & Martínez, 2006), two groups are identified which show significant differences in terms of sociodemographic variables, consumption variables and severity of addiction: one group of functioning users (type A), made up of cocaine users, with fewer medical, psychosocial and psychopathological problems; and a group of chronic users (type B), comprising heroin users and multiple drug users, who show a greater degree of functional and social deterioration and a tendency to infringe laws. Starting from this classification into two groups of consumers, in a later study (Graña, Muñoz & Navas, 2009) the differences between the variables and personality disorders were examined; the results showed that, while the functioning users scored significantly higher in extroversion and cordiality, the chronic users had higher scores in schizoid and dissocial PDs.

Bearing these results in mind, in this study the aim is to further the differentiation of the profiles of drug addicts starting from variables and personality disorders that seem to be relevant in the addictive process in research. In an earlier study (Carou, Romero, & Luengo, 2013) in which personality variables and consumption patterns of drug addicts who were in treatment were analyzed, the need arose to take into consideration a special group of addicts denominated "coca-heroin addicts", made up of patients who were rehabilitated heroin addicts but who later developed an addiction to cocaine. This group showed a profile that indicated a greater severity of addiction and marginalisation and certain peculiarities in the personality variables analyzed.

In this work, with an approach that is more focused on the person (Bergman & Magnusson, 1997) than on the variables, the intention is to understand the heterogeneity of addicts and analyze whether distinctive profiles may be identified by looking specifically at personality variables and those disorders which, as has been analyzed before, seem to be relevant to drug use. The analysis of addict profiles based on their personality traits allows us to go more deeply into the processes that lead to addiction and to develop treatments that are tailored to the personal and functional peculiarities of drug addicts. The need to identify specific types of addicts has been highlighted in earlier literature, and the broad body of research that has been generated over the last decade around personality and its disorders, as well as ADHD, suggests that it is useful to look at these constructs in order to define specific user profiles.

The main objective proposed by this study, therefore, is to identify specific addict profiles related to their personality and disorder profiles (PDs and ADHD). As specific objectives, the aims are a) to determine which variables and disorders have a greater weight in differentiating addict profiles, b) to examine how these profiles are associated with belonging to different user groups, and, c) to analyze whether these profiles are related to indicators of severity in use and criminological traits.

As has been pointed out, several earlier research projects suggest that two differentiated profiles may be specified, and for that reason it is now to be expected that, taking into account variables and personality disorders, these two profiles may be identified in a sample of addicts who are in treatment.

Method

Participants

In order to carry out this study, 176 adult addicts undergoing treatment at a Drug Addiction Treatment Centre (DATC, or UAD in its Spanish initials) belonging to the Galician public health network were evaluated. Of them, some 47.2% were diagnosed as heroin addicts, and 52.8% were addicted to cocaine. Of the cocaine addicts, 16 of the participants had previously been addicted to heroin. Given that the earlier studies (Carou et al., 2013) indicated that these coca-heroin addicts showed significant personal and psychosocial peculiarities, in the current study, all three types of users, cocaine, heroin and coca-heroin, are taken into account.

The principal criteria for being included in the sample were: addiction to cocaine or heroin according to CIE-10 criteria, being over 18 years of age, and signing the informed consent form. Patients undergoing treatment for addiction to another substance and those who show problematic consumption without being addicted were ruled out.

Instruments

Treatment Centre Management (**GECEAS** in its Spanish initials). This is a computer application by means of which a database of information recorded during interviews with the patient is built up. Apart from its information-gathering and evaluation functions, it also serves as a clinical management application for drug centres across Galicia and allows for all the processes that take place at a DATC to be handled, covering the clinical, assistance and management aspects. This study uses its Clinical History Module, which allows for several sociodemographic variables relating to use (such as age of onset, frequency), treatment (such as previous courses of treatment) and criminological (such as the number of arrests, time spent in prison) to be codified.

The **Barratt Impulsiveness Scale**, version 11 (BIS-11; Patton, Stanford & Barratt, 1995; Spanish adaptation by Oquendo et al., 2001). This is a self-administered scale for evaluating impulsiveness, composed of 30 items that are answered on a four-point Likert-type scale, providing scores in three

factors for impulsiveness (attentional, motor and non-planning), whose sum gives a measure of overall impulsiveness. For this study, the total score, with an internal consistency (Cronbach's alpha) of .79, was used. Suitable psychometric properties, regarding reliability and validity, were found in earlier studies with this scale (Carrillo-de-la-Peña, Otero & Romero, 1993; Oquendo et al., 2001).

Sensation Seeking Scale, form V, or SSS-V (Zuckerman, Eysenck & Eysenck, 1978; Spanish adaptation by Pérez & Torrubia, 1986). It comprises 40 forced-choice items which give scores in four subscales (thrill and adventure seeking, experience seeking, disinhibition and boredom susceptibility) and also an overall score resulting from the sum of the four subscales; this overall score was used in our study. The reliability of this scale in this study (Cronbach's alpha) was .76, and similar indices have been found in other research (Romero, Luengo & Sobral, 2001).

Grasmick, Title, Bursik and Arneklev's **Self-control Scale** (1993; Spanish adaptation by Romero et al., 2003). This scale consists of 24 items, with dichotomous response options, which allow for an overall self-control score to be obtained in accordance with Gottfredson and Hirschi's model (1990). The scale has shown its psychometric usefulness for evaluating the self-control construct in previous studies (e.g., Romero et al., 2003); in this study the overall measure showed, in a way that is similar to the earlier Spanish adaptation, internal consistency (Cronbach's alpha) of .89.

The **Adult ADHD Self-Report Scale Screened Questionnaire**, ASRS-VI.1, developed by the WHO in conjunction with Adler, Kessler, Spencer in 2005 (Kessler et al., 2005), follows DSM-IV criteria and focuses on the current symptomatology of ADHD in adults. In this study the abbreviated 6-item version of the screener (Spanish adaptation by Daigre et al., 2009) was used, which is the only screening test validated in Spanish and that offers psychometric guarantees for measuring ADHD in adults. Although the scale allows for a dichotomous categorisation between "probable" and "not probable", it also allows for dimensional scores (0 to 24), resulting from adding together the scores (0 to 4; from "never" to "very often") for each item to be used (Kessler, Adler, Gruber, Sarawate, Spencer & Van Brunt, 2007). This dimensional scoring was used in this study, with a Cronbach alpha reliability of .65.

International Personality Disorder Examination Screening Questionnaire (IPDE, Loranger, 1994), adapted in Spain by López-Ibor, Pérez-Urdaniz, and Rubio-Larrosa (1996). The IPDE is a widely-used instrument for obtaining scores in nine PDs identified by the WHO. It consists of 59 items to which the patient responds True or False, describing his behaviour over the last five years. In this research, the screening questionnaire was employed and, for the statistical analysis, the dimensional scores obtained corresponding to each of the disorders were used, with Cronbach alphas of between .43 (paranoid disorder) and .63 (anxiety disorder), similar to those reported in earlier studies (Slade and Forrester, 2013).

Procedure

On being admitted or readmitted for treatment, patients who attend a DATC voluntarily seeking treatment for their drug addiction enter the orientation and care program. The details necessary to fill in their computerized Clinical History are noted and they are diagnosed by specialists in clinical psychology and psychiatry by means of a clinical interview. For the purposes of this study, in addition, the above-mentioned self-administered tools were used. Completion of the forms took on average 60 minutes and was carried out on the premises, individually, thus guaranteeing the confidentiality of the data provided, under the supervision of the first author of this study. The management of the centre gave their approval for the study to be carried out, and its compliance with pertinent ethical principles was guaranteed; the project upheld the guidelines laid down by the Declaration of Helsinki, scrupulously respecting the rights of the participants throughout the study, from beginning to end.

Statistical Analysis

Firstly, the principal descriptive statistics of the sample (sociodemographic, use, criminological) were calculated, as well as the Pearson correlations between the scales (personality and disorder) applied in this study. In order to identify profiles that address the personality and disorder variables, a cluster analysis with a two-step algorithm was used, which performs pre-grouping (pre-clustering) and then a later hierarchical grouping. The mean distance considered was the Euclidian and, to determine the optimal number of clusters, the Schwarz Bayesian Criterion (SBC) was taken into account. For the characterisation of the resulting clusters and, in order to analyze their relationship with use and criminological variables, contingency tables with the Chi-square as the test statistic, and multivariate analysis of variance (MANOVA), incorporating the Bonferroni correction in order to minimize type I errors, were all used. For each of the analyses carried out in this study, those participants who provided valid data in all of the variables considered in the analysis were included. The analyses were carried out by means of the IBM SPSS 20 software package.

Results

Preliminary analysis: descriptives and correlations between variables

First of all, and with regard to the descriptive data of the sample (see Table 1), men made up 76.1% of the sample and women 23.3%, with a mean age of 32.1 years. The majority (55.7%) lived at home with their family of origin, were single (74.4) and did not have children (71%). In terms of income in the six months prior to the start of treatment,

around half of the sample were working while the other half received help from their family or were on benefits, or subsisted by means of marginal activities.

Regarding the characteristics of consumption, the mean onset age of the main drug for which patients sought treatment was 19.4 years. At the start of treatment, the majority (60.2%) were using the drug on a daily basis. The main combination drug, found in 44.3% of cases, was alcohol, followed by cocaine (among heroin addicts) and cannabis, at 22.2% each. Other substances were also habitually consumed. Among these, tobacco, used by almost the whole sample (94.3%), alcohol (77.8%) and cannabis (62.5%) stand out. It is worth noting that there were 0.8 visits to the emergency room (E.R.) due to consumption, although 62.5% of the sample have not had any. For 59.7% this was not the first course of treatment for a problem of substance abuse, and 48.3% have had previous psychiatric treatment.

In terms of the criminological variables under study, 34.7% of the participants have had legal problems, the mean age of their first arrest was 23.3 years, they were arrested 3.1 times on average, spent 3.7 months in jail and complied with 1.1 legal orders.

Secondly, in order to determine the relationship between the personality measures and the disorders under investigation, a Pearson correlation analysis was carried out (see Table 2).

An examination of how the personality variables are connected yields significant correlations for all of them. The disorders also present significant associations, with the highest correlations being those between impulsive PD with dissocial PD and ADHD, and between dependent PD with anxiety and borderline PD.

With regard to the correlations between personality dimensions and disorders, the highest correlations for impulsiveness were found in ADHD and impulsive PD. Sensation seeking is most strongly correlated with impulsive PD, while self-control correlates most strongly with impulsive TD, ADHD and dissocial PD.

Patient profiles linked to personality dimensions

In the search for homogeneous profiles of substance abuse, the personality/psychopathological variables mentioned in the introduction, and which in previous research had been consistently linked to the severity of drug use, i.e. impulsiveness, sensation seeking, self-control, ADHD and PD, were introduced into the cluster analyses. As a result, two well-differentiated clusters emerged, with a BIC of 1623.18 (BIC for three clusters = 1645.00; BIC for four clusters = 1719.10). Since previous research has also tended to identify two subtypes, the two-cluster solution was also preferred for this study, by virtue of both empirical (BIC) and conceptual criteria. Figure 1 shows the composition of the two clusters: a first cluster of 77 participants (43.8%) and a second with 99 participants (56.1%).

Table 1. *Sociodemographic, use and criminological profile of the sample.*

	% (N)	M (DT)
Sociodemographic variables		
Sex		
Male	76.7% (135)	
Female	23.3% (41)	
Age		32.16 (7.1)
Cohabitation		
Single	10.8% (19)	
Partner	10.8% (19)	
Single with children	1.7% (3)	
Partner with children	17% (30)	
Parents	55.7% (98)	
Friends	1.1% (2)	
Other	2.8% (5)	
Marital status		
Single	74.4% (131)	
Married	10.2% (18)	
Widowed	1.1% (2)	
Divorced/separated	14.2% (25)	
No children	71% (125)	
Source of income		
Employed	50% (88)	
Supported by family	23.8% (42)	
Social benefits	17% (30)	
Marginal activities	7.4% (13)	
Consumption characteristics		
Onset age		19.43 (4.69)
Frequency		
Every day	60.2% (106)	
4-6 per week	14.8% (26)	
2-3 per week	19.3% (34)	
1 per week	2.8 % (5)	
Less than 1	2.8% (5)	
Main combination drug		
Cocaine	22.2% (39)	
Alcohol	44.3% (78)	
Cannabis	22.2% (39)	
Benzodiazepine	2.8% (5)	
Tobacco	5.7% (10)	
Other habitually used drugs		
Heroin	18.2(16)	
Cocaine	35.8% (63)	
Alcohol	77.8% (137)	
Cannabis	62.5% (110)	
Benzodiazepine	28.4% (50)	
Synthetic drugs	14.8% (26)	
Tobacco	94.3% (166)	
No. E.R.		.82 (1.65)
Previous treatment	59.7% (105)	
Psychiatric treatment	48.3% (85)	
Criminological variables	34.7% (61)	
Age of first arrest		23.33 (7.02)
No. arrests		3.10 (5.25)
No. months in prison		3.70 (10.40)
Criminal proceedings		1.15 (1.86)

Table 2. *Correlations between disorders and personality variables.*

	Impulsiveness	Sensation seeking	Self-control	ADHD	Paranoid PD	Schizoid PD	Dissocial PD	Impulsive PD	Borderline PD	Histrionic PD	Anankastic PD	Anxious PD	Dependent PD
Impulsiveness		366***	.581***	.547***	.259**	.203**	.319***	.417***	.334***	.343***	-.222**	.244**	.312***
Sensation seeking			.512***	.290***	.371***	.045	.349***	.431***	.236**	.315***	-.007	.089	.077
Self-control				.458***	.349***	.199**	.436***	.610***	.325***	.272***	.013	.276***	319***
ADHD					.283***	.146	.339***	.462***	.304***	.140	-.069	.283***	.321***
Paranoid PD						.100	.338***	.383***	.270***	.274***	.264***	.269***	.177*
Schizoid PD							.249**	.234***	268***	.069	.186*	.308***	.341***
Dissocial PD								.494***	.222**	.195*	.057	.141	.127
Impulsive PD									.323***	.274***	.155*	.298***	.272***
Borderline PD										.293***	.098	.336***	.409***
Histrionic PD											.037	.106	.225**
Anankastic PD												.215**	.175*
Anxious PD													.471***
Dependent PD													

Note: In accordance with the coding instructions for the Grasmick et al. (1993) scale, a low score on this scale indicates low self-control.
Note: * p < .05, ** p < .01, *** p < .001

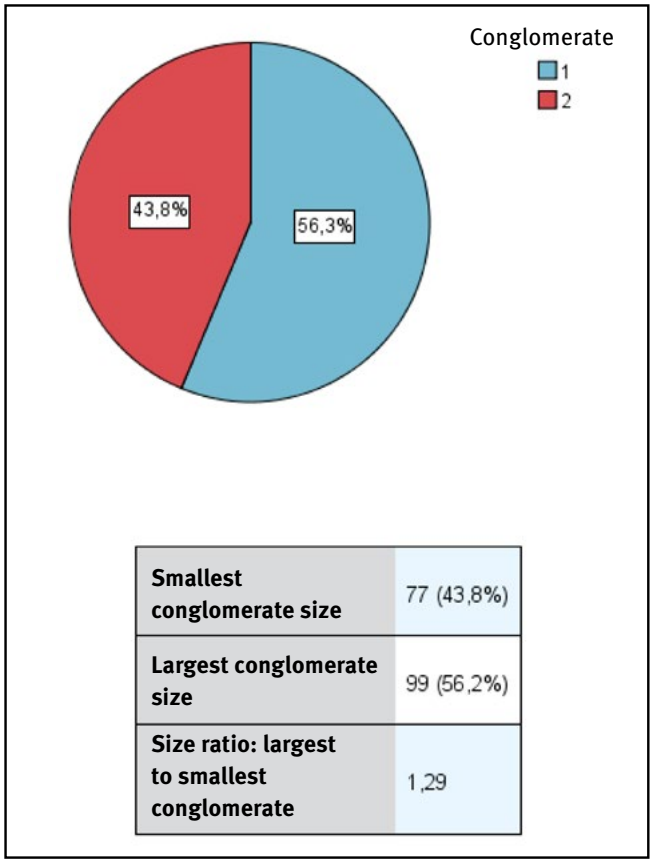

Figure 1. Size of the conglomerates identified in the cluster analysis.

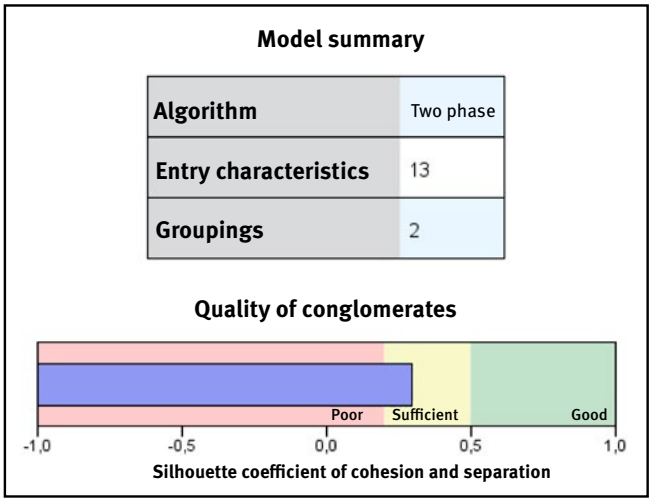

Figure 2. Summary of the model and quality indicator of the solution identified in the cluster analysis.

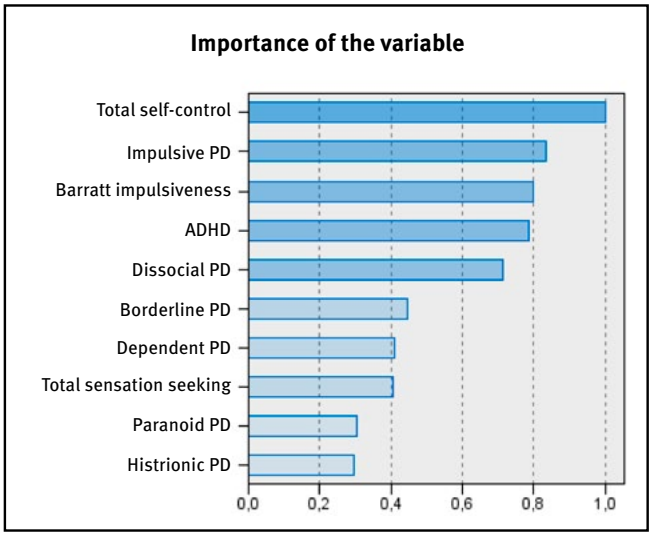

Figure 3. Importance of the variables in differentiating the two clusters.

Figures 2 and 3 present the quality of conglomerates test and the variables with the greatest weight in the cluster grouping, respectively.

The variables which contributed most strongly to group definition were: self-control, impulsive PD, impulsiveness, ADHD and dissocial PD, as shown in Figure 3.

Differences in the profiles regarding personality variables and disorders

With the aim of establishing a more accurate characterisation of the clusters on the basis of the variables introduced for their definition, the groups were compared by personality variables and disorders. This will make it possible to detail which personality profiles emerge for each of the groups. Given the multiple comparisons between the variables related to one another, a MANOVA was used, with results presented in Table 3.

As can be seen in the table, cluster 2 participants score significantly higher in all the variables ($p < .003$, using the Bonferroni adjustment to control for type I error), except for anankastic PD. Those individuals found in cluster 2 appear to have a more severe profile in terms of low self-control, high impulsiveness, high sensation seeking and greater scores for ADHD and for the majority of PDs.

Links between profiles and substance-user groups

In addition, a contingency tables analysis (see Table 4) was carried out in order to reveal how the three user groups (heroin, cocaine and coca-heroin addicts) are distributed across the two clusters.

As can be seen in the table, the chi-square was statistically significant, indicating an unequal distribution of the subjects across the groups. In particular, it can be noted that that a high proportion of the coca-heroin addicts are concentrated in the more severe personality cluster (cluster 2). This cluster contains 75% of the coca-heroin addicts, as opposed to 25% in cluster 1. Cluster 2 also has 41.7% of the cocaine addicts and 39.8% of the heroin addicts.

Both groups were also compared by sex and age. While no differences were found in terms of sex, with a chi-square (1) = 2.13, $p = .155$, there were differences in age, $F(1.174) = 12.44$, $p < .001$, with older subjects in cluster 1 ($M = 33.78$, $SD = 7.06$) compared to those in cluster 2 ($M = 30.09$, $SD = 6.63$).

Profiles in relation to indicators of substance use severity and criminality

Finally, we examined how the clusters were linked to severity of substance use and the criminological indicators assessed in this study. Given the differences in age across the

Table 3. *Results of the multivariable analysis of variance for the comparison of the two clusters regarding personality variables and disorders.*

	Group 1		Group 2					
	M	**SD**	**M**	**SD**	Λ	**F (gl)**	**Sig.**	η²
					.35	22.61 (13,161)	‹.001	.65
Impulsiveness	54.34	12.58	73.22	13.52		81.21 (1,173)	‹.001	.31
Sensation seeking	20.63	5.31	25.77	5.45		31.53 (1,173)	‹.001	.15
Self-control	10.65	3.78	16.88	3.60		112.91 (1,173)	‹.001	.39
ADHD	10.05	3.06	14.72	3.50		75.71 (1,173)	‹.001	.30
Paranoid PD	3.31	1.35	4.36	1.25		22.60 (1.173)	‹.001	.11
Schizoid PD	2.85	1.67	4.00	1.77		20.10 (1,173)	‹.001	.10
Dissocial PD	1.57	1.19	3.23	1.26		69.19 (1,173)	‹.001	.28
Impulsive PD	1.83	1.26	3.53	0.94		79.14 (1,173)	‹.001	.31
Borderline PD	2.32	1.20	3.46	1.03		39.06 (1,173)	‹.001	.18
Histrionic PD	2.07	1.29	3.07	1.25		20.97 (1,173)	‹.001	.18
Anankastic PD	2.98	1.65	3.10	1.58		.82 (1,173)	.351	.01
Anxious PD	3.33	1.40	4.28	1.21		18.94 (1,173)	‹.001	.09
Dependent PD	2.14	1.34	3.41	1.30		38.01 (1,173)	‹.001	.18

Table 4. *Results of the chi-square between the two clusters and the three user groups.*

	Cocaine	**Heroin**	**Coca-heroin**	**Total**	**Chi²**	**Sign.**
Group 1	58.3% (42)	60.2% (50)	25.0% (4)	56.1% (96)	7.00	‹.05
Group 2	41.7% (30)	39.8% (33)	75.0% (12)	43.9% (75)		

Table 5. *Results of the multivariable analysis of variance for the comparison of the two clusters regarding severity of use and criminological indicators.*

	Group 1		Group 2					
	M	**SD**	**M**	**SD**	Λ	**F (gl)**	**Sig.**	η²
Severity of use indicators					.42	4.78 (1,167)	‹.001	.19
Onset age	20.55	5.16	17.99	3.55		7.41 (1,173)	‹.05	.10
Frequency of use	1.68	1.03	1.81	1.06		.05 (1,173)	.82	.00
No. E.R.	.59	1.16	1.10	2.10		6.23 (1,173)	‹.001	.10
Previous treatments	.59	.49	.61	.49		3.30 (1,173)	‹.05	.03
Criminological indicators					.38	4.49 (4,56)	‹.01	.16
No. arrests	.65	1.30	1.67	4.93		3.21 (1,59)	‹.05	.07
Age of first arrest	24.73	7.40	21.97	6.45		2.42 (1,59)	.12	.03
Months of prison	1.62	7.97	.92	3.35		1.16 (1,59)	.28	.02
Criminal proceedings	.51	.97	1.13	2.44		5.23 (1,59)	‹.01	.10

groups and that this could be a spurious variable affecting the results of the comparisons, the age variable was controlled for in the MANOVAs. The results are shown in Table 5.

As can be seen in the table, onset age is significantly lower in cluster 2, although the significance becomes marginal when the Bonferroni correction is applied ($p < .012$). On applying the correction, however, the difference in terms of emergencies, greater in cluster 2, remains significant. A tendency towards more previous treatment in cluster 2 can be observed ($p = .05$), but this is not significant once the Bonferroni correction is applied.

With regard to criminological indicators, the number of criminal prosecutions in which participants have been involved is higher in cluster 2, and the difference remains significant on application of the Bonferroni correction ($p < .012$); the number of arrests also tends to be higher in cluster 2, although significance is marginal.

Discussion

The present study aims to investigate the heterogeneity of the substance dependent population by examining whether differentiated personal profiles can be identified. The results of cluster analysis revealed interesting data regarding the typology of substance dependence, delimiting two groups differentiated in particular in terms of self-control, impulsive PD, total impulsiveness, ADHD and dissocial PD. The second group contains those who score significantly higher in practically all variables and is characterised by a personal profile which suggests greater disinhibition, and thus a greater risk of severity, demonstrates lower self-control, high levels of impulsiveness and sensation seeking, higher scores in the disorders, of both personality and ADHD. This cluster also includes those patients with indicators of severity and criminality which in general, based on the MANOVA, are more extreme, particularly in connection with emergencies for substance abuse and more criminal prosecutions, which corroborates the psychosocial difficulties suggested by their personality profile.

These results are comparable to the alcohol addiction subtypes found by Cloninger (1987): type I with low scores in novelty seeking, type II with high scores in novelty seeking, early onset of problems with alcohol and consumption continued for longer, among other characteristics; or those referred to by Babor et al. (1992) as type A and B. Profile I or A would be less serious, with later onset, less heritability and fewer risk factors in infancy, and lower dependence. Type II or B, on the other hand is characterised by greater severity, dependence, heritability, novelty and sensation seeking, impulsive and antisocial behaviour. Ball (1995) discovered similar results in an analysis of cocaine users, with those in group B presenting more comorbid risk factors, greater cocaine and alcohol abuse severity, more associated psychosocial problems, antisocial PDs, psychiatric problems, criminality and drug and psychiatric treatments, as well as higher scores for sensation seeking. Our differentiated profiles thus correspond with those previous studies mentioned, with type II or B being more severe than I or A. Similarly, a certain parallelism can be found with those typologies labelled functional and chronic by Muñoz et al. (2006), the latter being the more severe, reflecting longer years of use and psychosocial problems associated with drugs. The differences we find in our study could also correspond to the types identified by Echeburúa, Bravo de Medina and Aizpiri (2008) in a study of alcoholics. They found that apart from greater impulsiveness and sensation seeking, those in type II also had a greater number of personality disorders (in particular obsessive, narcissistic, paranoid and antisocial disorders), more dramatic/erratic disorders (antisocial, borderline, histrionic and narcissistic PDs); furthermore, the

appearance in type II alcoholics of a profile with greater psychopathological symptomatology (impulsiveness and hostility) suggest that multicomponent treatment programmes would be beneficial. Our results are also congruent with the finding of Graña et al. (2006) in the sense that higher scores in dissocial personality disorder are characteristic of chronic substance abusers.

The clusters found are thus similar to those in preceding studies, both for alcoholism and illegal substances, of a type 2 with a more severe profile, mainly corresponding to coca-heroin addicts, as revealed in previous research (Carou et al., 2013) with a profile of greater severity, marginalization, and also legal problems, an earlier onset age, greater impulsiveness and boredom susceptibility. These results also endorse the definition of coca-heroin addicts as a special category of cocaine users with its own profile and which should be considered separately within the field of substance dependence. Indeed, other studies have observed that among drug users, those who are dependent on more than one substance are more impulsive that those addicted to only one (McCown, 1988; O´Boyle & Barratt, 1993). Farrington (1992), for example, has pointed out the existence of a general antisocial predisposition made up of a series of risk factors among which impulsiveness, hyperactivity, sensation seeking, risk taking and the inability to defer gratification stand out.

Furthermore, our research confirms the results of other studies which have associated high sensation seeking and impulsiveness with addiction (Ball, 2004; Hittner & Swickert, 2006), and also the severity of the addiction (Dom, De Wilde, Hulstijn, Van Den Brink, & Sabbe, 2006; Horvath, Milich, Lynam, Leukefeld, & Clayton, 2004). There seems to be an association between disorders which have impulsiveness in common, in particular disorders of impulse control, personality, those related to substance use, and ADHD, giving rise to comorbidity and what is beginning to be termed tri-morbidity (Tiffon, 2008). The appearance of PDs (in particular dissocial, impulsive, and borderline personality disorders), as well as ADHD are linked in the literature to the presence of addiction, and serving to indicate the severity of substance use (Ball, 1995), both in terms of earlier onset age and the presence of more emergencies or treatment failures (Verheul et al., 1995, Biederman, Wilens, Mick, Faraone, & Spencer, 1998). This is also borne out in our study.

The present study has some limitations which should be taken into account. For example, the sample analysed has not been compared with a control group from the general population, nor was it possible to expand data gathering to different centres, which would have allowed us to include other groups of substance users; secondly, the evaluation of personality and disorder variables was carried out entirely on the basis of questionnaires and consequently subject to biases such as social desirability, as described in the literature; thirdly, other important substances which cause people to seek treatment were excluded, such as cannabis and alcohol, and results are therefore not generalisable to substance dependence in general but need to be contextualised with regard to the substances under study and among individuals who have sought help for them; finally, the cross-sectional nature of this study does not permit assumptions to be made as to the potential influence of personality characteristics and disorders on how patients adjust and respond to treatment. Nevertheless, it has been possible to establish the existence of specific profiles among different types of substance users associated with personality variables. The study has also allowed us to confirm the importance of PDs and ADHD in the delineation of a subtype with more severe characteristics of use. The disorders linked to impulsiveness and disinhibition appear to play a crucial role in the psychological characterisation of the most severe addiction patterns, and this should be borne in mind when assessing the treatment needs of substance dependent users

Conflict of interests

The authors declare that there is no conflict of interests in this study.

References

Babor, T. F., Hofmann, M., Desboca, F. K., Hesselbrock, V., Meyer, R. E., Dolinski, Z. S. & Rounsaville, B. (1992). Types of alcoholics, I: Evidence for an empirically derived typology based on indicators of vulnerability and severity. *Archives of General Psychiatry, 49*, 599-608. doi:10.1001/archpsyc.1992.01820080007002.

Ball, S. A. (1995). The validity of an alternative five-factor measure of personality in cocaine abusers. *Psychological Assessment, 7,* 148-154. doi:10.1037/1040-3590.7.2.148.

Ball, S. A. (2004). Personality traits, disorders and substance abuse. En R. M. Stelmack (Ed.), *On the psychobiology of personality: Essays in honor of Marvin Zuckerman* (pp. 203-222). Amsterdam: Elsevier. doi:10.1016/B978-008044209-9/50013-0.

Belin, D., Mar, A. C., Dalley, J. W., Robbins, T. W. & Everitt, B. J. (2008). High impulsivity predicts the switch to compulsive cocaine-taking. *Science*, *320*, 1352-1355. doi:10.1126/science.1158136.

Bergman, L. R. & Magnusson, D. (1997). A person-oriented approach in research on developmental psychopathology. *Development and Psychopathology*, *9*, 291-319. doi:10.1017/S095457949700206X.

Biederman, J., Wilens, T. E., Mick, E., Faraone, S. V. & Spencer, T. (1998). Does attention-deficit hyperactivity disorder impact the developmental course of drug and alcohol abuse and dependence? *Biological Psychiatry, 44,* 269-273. doi:10.1016/S0006-3223(97)00406-X.

Biederman, J., Wilens, T. E., Mick, E., Milberger, S., Spencer, T. J. & Faraone, S. V. (1995). Psychoactive substance use disorders in adults with attention-deficit/hyperactivity disorder (ADHD): Effects of ADHD and psychiatric comorbidity. *American Journal of Psychiatry, 152,* 1652-1658.

Carou, M., Romero, E. & Luengo, M. A. (2013). Patrones de consumo y variables de personalidad en drogodependientes a tratamiento. *Revista Española de Drogodependencias, 3,* 217-232.

Carrillo-de-la-Peña, M. T., Otero, J. M. & Romero, E. (1993). Comparison among various methods of assessment of impulsiveness. *Perceptual and Motor Skills, 77,* 567-575.

Cloninger, C. R. (1987). A systematic method for clinical description and classification of personality variants. *Archives of General Psychiatry, 44,* 573-588. doi:10.1001/archpsyc.1987.01800180093014.

Daigre, C., Ramos-Quiroga, J. A., Valero, S., Bosch, R., Roncero, C., Gonzalvo, B. & Nogueira M. (2009). Adult ADHD Self-Report Scale (ASRS-v1.1) symptom checklist in patients with substance use disorders. *Actas Españolas de Psiquiatría, 37,* 299-305.

Dom, G., De Wilde, B., Hulstijn, W., Van Den Brink, W. & Sabbe, B. (2006). Behavioral aspects of impulsivity in alcoholics with and without a cluster-B personality disorder. *Alcohol and Alcoholism, 41,* 412-420.

Echeburúa, E., Bravo De Medina, R. & Aizpiri, J. (2008). Variables de personalidad, alteraciones psicopatológicas y trastornos de personalidad en pacientes con dependencia de alcohol en función de la tipología de Cloninger. *Psicothema, 20,* 525-530.

Echeburúa, E., De Medina, R. B. & Aizpiri, J. (2007). Comorbidity of alcohol dependence and personality disorders: A comparative study. *Alcohol and Alcoholism, 42,* 618-622. doi:10.1093/alcalc/agm050.

Farrington, D. P. (1992). Explaining the beginning, progress and ending of antisocial behaviour from birth to adulthood. En J McCord (Eds.), *Facts, frameworks and forecasts: Advances in criminological theory, 3* (pp. 353-286). New Brunswick, NJ: Transaction Press.

Fillmore, M. T., Ostling, E. W., Martin, C. A. & Kelly, T. H. (2009). Acute effects of alcohol on inhibitory control and information processing in high and low sensation-seekers. *Drug and Alcohol Dependence, 100,* 91-99. doi:10.1016/j.drugalcdep.2008.09.007.

Frei, A. & Rehm, J. (2002). The prevalence of psychiatric co-morbidity among opioid addicts. *Psychiatrische Praxis, 29,* 258-262.

Gallupe, O. & Baron, S. W. (2014). Morality, self-control, deterrence, and drug use: Street youths and situational action theory. *Crime & Delinquency 60,* 284-305. doi:10.1177/0011128709359661.

González, C. (2014). Screening for personality disorder in drug and alcohol dependence. *Psychiatry Research, 217,* 121-123. doi:10.1016/j.psychres.2014.03.007.

Gottfredson, M. R. & Hirschi, T. (1990). *A general theory of crime.* Stanford, CA: Stanford University Press.

Gottfredson, M. R. & Hirschi, T. (1994). A general theory of adolescent problem behavior. En R. D. Ketterlinus & M. E. Lamb (Eds), *Adolescent problem behaviors: Issues and research* (pp. 41-56). Hillsdale, NY: Erlbaum.

Graña, J. L., Muñoz, J. J. & Navas, E. (2009). Normal and pathological personality characteristics in subtypes of drug addicts undergoing treatment. *Personality and Individual Differences, 46,* 418-423.

Grasmick, H. G., Title, C. R., Bursik, R. J. & Arneklev, B. J. (1993). Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency, 30,* 5-29.

Grogan, K. & Bramham, J. (2016). Demographic, developmental and psychosocial predictors of the development of anxiety in adults with ADHD. *Journal of Attention Deficit and Hyperactivity Disorder, 8,* 35-44. doi:10.1007/s12402-015-0183-0.

Gullo, M. J., Loxton, N. J. & Dawe, S. (2014). Impulsivity: Four ways five factors are not basic to addiction. *Addictive Behavior*s. 39, 1547-1556. doi:10.1016/j.addbeh.2014.01.002.

Hittner, J. B. & Swickert, R. (2006) Sensation seeking and alcohol use: A meta-analytic review. *Addictive Behaviors, 31,* 1383-1401. doi:10.1016/j.addbeh.2005.11.004.

Horvath, L. S., Milich, R., Lynam, D., Leukefeld, C. & Clayton, R. (2004). Sensation Seeking and substance use: A cross-lagged panel design. *Individual Differences Research, 2,* 173-183.

Kalbag, A. S. & Levin, F. R. (2005). Adult ADHD and substance abuse: Diagnostic and treatment issues. *Substance Use and Misuse, 40,* 1955-1981. doi:10.1080/10826080500294858.

Kessler, R. C., Adler, L., Ames, M., Delmer, O., Faraone, S., Hiripi, E.,… Walters E.E. (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35,* 245-256. doi:10.1017/S0033291704002892.

Kessler, R. C., Adler, L. A., Gruber, M. J., Sarawate, C. A., Spencer, T. & Van Brunt, D. L. (2007). Validity of the World Health Organization Adult ADHD Self-Report Scale (ASRS) screener in a representative sample of health plan members. *International Journal of Methods in Psychiatric Research, 16,* 52-65. doi:10.1002/mpr.208.

López-Ibor, J. J., Pérez-Urdaniz, A. & Rubio-Larrosa, V. (1996). *Examen Internacional de los Trastornos de la Personalidad (IPDE) Módulo DSM-IV y CIE-10.* Madrid: Meditor.

López-Torrecillas, F., Peralta, I., Muñoz-Rivas, M. J. & Godoy, J. F. (2003). Autocontrol y consumo de drogas. *Adicciones, 15,* 127-136. doi:10.20882/adicciones.436.

López, A. & Becoña, E. (2006). Consumo de cocaína y psicopatología asociada: una revisión. *Adicciones, 18,* 161-196.

Luengo, A., Otero-López, J. M., Romero, E. & Gómez, J. A. (1996). Efectos de la necesidad de búsqueda de sensaciones sobre la involucración en el consumo de drogas de los adolescentes. *Análisis y Modificación de Conducta, 22,* 683-708.

Magnavita, J.J. (Ed.) (2004). *Handbook of personality disorders: Theory and practice.* Nueva York: Wiley.

McCown, W. G. (1988). Multi-impulsive personality disorder and multiple substance abuse: Evidence from members of self-help groups. *British Journal of Addiction, 83,* 431–432. doi:10.1111/j.1360-0443.1988.tb00490.x.

Motos-Sellés, P., Cortés-Tomás, M.T., Giménez-Costa, J.A. & Cadaveira-Mahía, F. (2015). Predictores del consumo semanal de alcohol y sus consecuencias asociadas en universitarios consumidores intensivos de alcohol. *Adicciones, 27,* 119-131. doi:10.20882/adicciones.700.

Muñoz, J. J., Navas, E., Graña, J. L. & Martínez, R. (2006). Subtipos de drogodependientes en tratamiento: apoyo empírico para una distinción entre Tipo A y Tipo B. *Psicothema, 18,* 43-51.

Nadal-Alemany, R. (2008). La búsqueda de sensaciones y su relación con la vulnerabilidad a la adicción y al estrés. *Adicciones, 20,* 59-72. doi:10.20882/adicciones.289.

O'Boyle, M. & Barratt, E. S. (1993). Impulsivity and DSM-III-R personality disorders. *Personality and Individual Differences, 14,* 609–611. doi:10.1016/0191-8869(93)90156-W.

Olmstead, M. C. (2006). Animal models of drug addiction: Where do we go from here? *Quarterly Journal of Experimental Psychology, 59,* 625–653. doi:10.1080/17470210500356308.

Oquendo, M. A., Baca-García, E., Graver, R., Morales, M., Montalvan, V. & Mann, J. J. (2001). Spanish adaptation of the Barratt Impulsiveness Scale (BIS-11). *European Journal of Psychiatry, 15,* 147-155.

Patton, J. H., Stanford, M. S. & Barratt, E. S. (1995). Factor structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology, 51,* 768-774.

Pérez, J. & Torrubia, R. (1986). Fiabilidad y validez de la versión española de la escala de Búsqueda de Sensaciones-Forma V. *Revista Latino-Americana de Psicología, 18,* 7-22.

Ramos-Quiroga, J. A., Bosch-Munsó, R., Castells-Cervelló, X., Nogueira-Morais, M., García-Giménez, E. & Casas-Brugué, M. (2006). Trastorno por déficit de atención con hiperactividad en adultos: caracterización clínica y terapéutica. *Revista de Neurología, 42,* 600-606.

Romero, E. & Alonso, C. (2015). Hyperactive behaviors from childhood to adolescence: Prospective outcomes in a sample of Spanish children. *International Journal of Psychological Studies, 7,* 67-75. doi:10.5539/ijps.v7n3p67.

Romero, E., Gómez-Fraguela, J. A., Luengo, M. A. & Sobral, J. (2003). The self-control construct in the general theory of crime: An investigation in terms of personality psychology. *Psychology, Crime and Law, 9,* 61-86. doi:10.1080/10683160308142.

Romero, E., Luengo, M. A. & Sobral, J. (2001). Personality and antisocial behaviour: Study of temperamental dimensions. *Personality and Individual Differences, 31,* 329-348. doi:10.1016/S0191-8869(00)00139-2.

Romero, E., Sobral, J. & Luengo, M. A. (1999). *Personalidad y delincuencia: Entre la biología y la sociedad.* Granada, España: Grupo Editorial Universitario.

Romero-Martínez, A. & Moya-Albiol, L. (2015). Déficits neuropsicológicos asociados a la relación entre abuso de cocaína y violencia: Mecanismos neuronales facilitadores. *Adicciones, 27,* 64-74. doi:10.20882/adicciones.194.

Schubiner, H., Tzelepis, A., Milberger, S., Lockhart, N., Kruger, M., Kelley, B. J. & Schoener, E. P. (2000). Prevalence of attention-deficit/hyperactivity disorder and conduct disorder among substance abusers. *Journal of Clinical Psychiatry, 61,* 244-251. doi:10.4088/JCP.v61n0402.

Slade, K. & Forrester, A. (2013). Measuring IPDE-SQ personality disorder prevalence in presentence and early-stage prison populations, with sub-type estimates. *International Journal of Law and Psychiatry, 36,* 207–212.

Stautz, K. & Cooper, A. (2013). Impulsivity-related personality traits and adolescent alcohol use: A meta-analytic review. *Clinical Psychology Review, 33,* 574-592. doi:10.1016/j.cpr.2013.03.003.

Tiffon, B. N. (2008). Una trimorbilidad forense emergente: el trastorno de personalidad, el trastorno del control de los impulsos y el abuso de sustancias tóxicas. *Anuario de Psicología Jurídica, 18,* 91-97.

Verheul, R. (2001). Co-morbidity of personality disorder in individuals with substance use disorders. *European Psychiatry, 16,* 274-282. doi:10.1016/S0924-9338(01)00578-8.

Verheul, R., van der Brink, W. & Hartgers, C. (1995). Prevalence of personality disorders among alcoholics and drug addicts: An overview. *European Addiction Research, 1,* 166-177. doi:10.1016/S0924-9338(01)00578-8.

Wilens T. E. (2007). The nature of the relationship between attention-deficity/hyperactivity disorder and substance abuse. *Journal of Clinical Psychiatry, 68,* 4-8.

Zuckerman, M. (1979). *Sensation Seeking: Beyond the optimal level of arousal.* NY: Erlbaum.

Zuckerman, M., Eysenck, S. & Eysenck, H. J. (1978). Sensation seeking in England and America: Cross-cultural, age and sex comparisons. *Journal of Consulting and Clinical Psychology, 46,* 139-149. doi:10.1037/0022-006X.46.1.139.