¿Podemos predecir el uso de psicoestimulantes en jóvenes? Un estudio a partir de un modelo de ecuaciones estructurales.

Can we predict psychostimulant use in youths? A study with structural equation modeling analysis

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¿Podemos predecir el uso de psicoestimulantes en jóvenes? Un estudio a partir de un modelo de ecuaciones estructurales.

Conocer qué factores predicen el consumo de psicoestimulantes en jóvenes es importante para el diseño de programas preventivos y para identificar a los jóvenes que tienen una mayor probabilidad de consumir y así evitar que aparezcan los problemas derivados de dicho consumo. El objetivo de este estudio fue analizar la relación entre la disponibilidad percibida, la percepción de riesgo, los rasgos de personalidad, los patrones de personalidad antisocial y el consumo de otras sustancias en la predicción del consumo de psicoestimulantes. La muestra estuvo formada por 1.177 jóvenes (584 varones y 593 mujeres) de entre 14 y 25 años en España, reclutados aleatoriamente, estratificados por consumo-no consumo de psicoestimulantes (cocaína o éxtasis) alguna vez en la vida. El path que mejor predijo el consumo de psicoestimulantes fue: rasgos de personalidad-patrones de personalidad antisocial- consumo de psicoestimulantes. El siguiente path fue: rasgos de personalidad-antisocial personalidad patterns-psychostimulant use. La percepción de riesgo y la disponibilidad percibida fueron significativas en la predicción, pero aportaron una contribución menor. Los resultados de este estudio sugieren que el modelo evaluado es adecuado para la predicción del consumo de psicoestimulantes en jóvenes. Este modelo puede ser de utilidad para desarrollar estrategias preventivas y para identificar a aquellos jóvenes con riesgo de tener problemas relacionados con el consumo de drogas.

Palabras clave: psicoestimulantes, jóvenes, disponibilidad percibida, percepción de riesgo, personalidad, impulsividad, búsqueda de sensaciones.

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Knowing which factors predict the use of psychostimulant drugs among youths is important for designing preventive programs and the identification of youths with the highest probability of use, to avoid some of the problems that can be derived from it. The purpose of this study is to examine the relationship between perceived availability, risk perception, personality traits, antisocial personality patterns, and use of other substances in the prediction of psychostimulant use. The sample was composed by 1,177 youths (584 males and 593 females) aged 14 to 25 in Spain, recruited randomly, stratified by lifetime use- non use of psychostimulants (cocaine or ecstasy). The path which best predicts psychostimulant use is: Personality traits-legal substance use-cannabis use-psychostimulant use. The next path is: Personality traits-antisocial personality patterns-psychostimulant use. Risk perception and perceived availability were significant in the prediction, but made a smaller contribution. The results of this study suggest that the model evaluated can predict psychostimulant use in youths. This model can be seen as a useful tool for developing preventive strategies and for identifying those youths that are at risk for problems related to drug use.

Key words: Psychostimulants, youths, perceived availability, risk perception, personality, impulsiveness, sensation-seeking.
El uso de psicoestimulantes entre jóvenes tiene consecuencias negativas para la salud (Steinberg, 2010; Sussman, Skara, & Ames, 2008). Conocer qué factores predicen su uso (y cómo se relacionan entre sí) es importante para diseñar programas preventivos y la identificación de jóvenes con el mayor riesgo de uso, para evitar algunos de los problemas derivados de ello.

Diversos factores y protección asociados con el uso de drogas han sido analizados, individualmente e intercambiariamente (Hawkins, Catalano, & Miller, 1992; Calafat et al., 2010). Aunque hay menos estudios que examinan la relación entre la impulsividad, la tendencia a buscar sensaciones, la percepción de disponibilidad de psicoestimulantes, el riesgo de psicoestimulantes, los patrones antisociales, el uso de otros psicoactivos (tabaco, alcohol y cannabis), con el objetivo de predecir el uso de psicoestimulante (cocaína y ecstasy).

**Riesgo de percepción**

Sabemos que la percepción de riesgo de una sustancia es importante para tomar decisiones sobre su uso. El nivel de riesgo percibido por jóvenes es diferente para diferentes sustancias, su uso: el mayor es la percepción de riesgo del uso de una droga, el menor es su uso, y viceversa (Bachman, Johnston, O’Malley, & Humphrey, 1988; Kilmer, Hunt, Lee, & Neighbors, 2007; Leung, Ben Abdallah, Copeland, & Cottler, 2010). Por ejemplo, en la década de 1970 en los EE.UU., el uso de marihuana se hizo más popular y los niveles de uso disminuyeron; a partir de entonces, la percepción de riesgo aumentó y los niveles de uso disminuyeron, una situación que duró hasta la década de 1990. Sin embargo, a principios de los años 1990, los niveles de percepción de riesgo disminuyeron y el uso de la droga aumentó, hasta los últimos años cuando los niveles de uso disminuyeron (Bachman, O’Malley, Schulenberg, Johnston, Freedman-Doan, & Messermith, 2008). Esta tendencia ha llevado a un cambio en las decisiones de las autoridades en diferentes países con respecto a la prevención de uso de drogas.

**Percepción de disponibilidad**

En cuanto a la percepción de disponibilidad, sabemos que el acceso a una sustancia es más fácil, cuanto mayor es su probabilidad de uso (Degendhart et al., 2008).

**Características de personalidad: Impulsividad y tendencias a buscar sensaciones**

El estudio de la impulsividad y la tendencia a buscar sensaciones, como las personas y el uso de sustancias, es un factor de riesgo. El uso de sustancias, en particular drogas ilegales, se ha estudiado en extenso (Kubicka, Matejec, Dytrich, & Roth, 2001; Palmer, Montaño, & Calafat, 2000; Verheul & Van den Brink, 2000). El estudio muestra una relación clara entre la impulsividad y el uso de drogas. Los altos niveles de impulsividad en edades tempranas están relacionados con el uso de drogas y con problemas de drogas en la adultez (Dawe, Gullo, & Loxton, 2004; Forcada, Pardo, & Bondía, 2006; Tarter et al., 2003; Von Diemen, Garcia, Costa, Maciel, & Pechansky, 2008; Verdejo-Garcia, Lawrence, & Clark, 2008). En el otro lado, la tendencia a buscar sensaciones, definida como la necesidad individual de nuevos, complejos, y variados experiencias y sensaciones, con la intención de tomar riesgos físicos y sociales a satisfacer esa necesidad (Zuckerman, 1979), está asociada con el uso de drogas (Fergusson, Boden, & Horwood, 2005; Kahler, Read, Wood, & Palfai, 2003; Martins, Storr, Alexandre, & Chilcoat, 2008).

En cuanto a la relación entre la tendencia a buscar sensaciones y impulsividad, la percepción de droga, Belin, Mar, Dalley, Robbins, & Everitt (2008) sugiere que la percepción de droga determina si o no un comienzo de drogas, mientras que la impulsividad podría ser responsable del mantenimiento del uso, y a la vez para el surgimiento de los abusos y los problemas de dependencia.

**Patrones antisociales**

La relación entre el uso de drogas y los trastornos de personalidad se ha estudiado ampliamente, dada la alta prevalencia de estos tipos de trastornos entre los que se busca tratamiento para el uso de drogas. Muchos estudios han observado que los trastornos antisociales (caracterizados por impulsividad) son los más comunes entre los que dependen de drogas en tratamiento (Chabrol, Ducongé, Casas, Roura, & Carey, 2005; Cohen, Chen, Crawford, Brook, & Gordon, 2007; Fantin, 2006; Keyses, Martins, & Hasin, 2008; Korhonen et al., 2008; López & Becoña, 2006a); Taylor, 2005. Además, la presencia de estos trastornos de carácter antisocial en los usuarios de drogas tiene un efecto negativo en su tratamiento: Utilizar sustancias ilegales mucho más comúnmente, que muestran un patrón nocivo de consumo de drogas, que son más comprensivos y que presentan mayores problemas psicopatológicos, mayor impulsividad, y mayor satisfacción con sus vidas y una mayor desaceleración (Nace, Davis, & Gaspari, 1991).

En los jóvenes, la presencia de los llamados trastornos antisociales (comportamiento antisocial, comportamiento antisocial en la adultez) está altamente asociada con el uso de drogas (Becoña et al., 2011; Dierker, Vesel, Sledjeski, Costello, & Perrine, 2007). Además, la presencia de conducta disociativa a la edad 13 años previste uso de sustancias en la adultez (Cohen et al., 2007).

**Alcohol, tabaco y cannabis**

Ahora, las drogas usadas por jóvenes se caracteriza por uso polivariado (Chung & Martin, 2011; Johnston, O’Malley, Bachman, & Schulenberg, 2009; Observatorio Español sobre Drogas, 2009). Es claramente relacionado con la transición a la utilización de otras drogas y, como la Hipótesis Gateway sugiere, el uso de drogas comienza con leyes legales (alcohol y tabaco) y continúan con drogas ilegales (Kandel & Faust, 1975; Kandel, 2002). Por lo tanto, debemos considerar la utilización anterior de otras sustancias, como el tabaco, el alcohol y la cannabis para explicar el uso de psicoestimulantes.

En el presente estudio, nuestra meta es probar un modelo que explique el impacto de las características de personalidad, percepción de disponibilidad, riesgo de percepción, trastornos antisociales, patrones legales de sustancias, y cannabis en psicoestimulante uso/non-
use in youths using structural equation modeling (SEM). In particular, we hypothesize that:

1) Sensation-seeking and impulsiveness are related to drug use (Martins et al., 2008; Verdejo-García et al., 2008; Von Diemen et al., 2008), so that they predict the use of tobacco, drunkenness, and cannabis and that the use of these substances predicts psychostimulant use (cocaine and ecstasy). In the case of alcohol use we have considered as a variable the incidence of drunkenness due to frequent and normative drinking within Mediterranean culture (Observatorio Español sobre Drogas, 2009).

2) Sensation-seeking and impulsiveness are personality traits that characterize certain personality patterns, such as antisocial (American Psychiatric Association, 2000; Millon & Davis, 1998), so that the presence of impulsiveness and sensation-seeking predicts antisocial personality pattern, which in turn predicts psychostimulant use (cocaine and ecstasy).

3) Perceived availability (Degenhardt et al., 2008) and perceived risk of psychostimulant use (Leung et al., 2010) also predict the use of these substances, so that high perceived availability and low perceived risk associated with psychostimulant use predict their use.

**Method**

**Participants**

We selected a representative sample of 1,214 youths aged 14 to 25 from seven cities in Galicia (Spain). The sampling was random, stratified by cities, age (14-17, 18-21 and 22-25), gender (male, female), and lifetime use or non use of psychostimulants (cannabis and ecstasy), with personal interviews in households and in leisure and recreational venues, to ensure adequate representativeness of psychostimulant use versus non-use.

Of the 1,214 participants, 1,177 had completed all measures: 584 were males (49.6%) and 593 were females (50.4%). Mean age of the sample was 19.65 years (SD = 3.13). Fifty per cent (n = 590) presented lifetime use of psychostimulants (cannabis and/or ecstasy) [33.8% (n = 398) had lifetime use of ecstasy and 44.4% of cocaine (n = 522)]. Regarding use in the last year, 48.2% of the sample had used psychostimulants in the last year [22.5% (n = 265) had used ecstasy and 32.7% (n = 385) had used cocaine].

Percentage of rejections for the total sample was 31.5%.

**Measures**

Assessment of substance use was carried out by the following items: Psychostimulant use (Have you taken cocaine at any time in your life?; Have you taken ecstasy at any time in your life?), tobacco use (Have you smoked cigarettes at any time in your life?) cannabis use (Have you used cannabis at any time in your life?), and high levels of alcohol use (drunkenness; Have you ever been drunk?).

Assessment of perceived availability of cocaine and ecstasy and the perceived risk associated with the occasional use of cocaine and ecstasy was carried out using items from the study by Johnston, O’Malley, and Bachman (2001) [e.g., How difficult do you think it would be for you to get cocaine, if you wanted some? (answer categories were: Probable impossible, very difficult, fairly difficult, fairly easy, and very easy); How much do you think people risk harming themselves (physically or in other ways) if they try cocaine once or twice (answer categories were: No risk, slight risk, moderate risk, great risk, and can’t stay, drug unfamiliar)].

Sensation-seeking was assessed by means of the Sensation Seeking Scale V (SSS-V; Zuckerman, 1979, 2007). It is a questionnaire of 40 items with dichotomous response format consisting of four subscales with ten items each: Thrill and Adventure Seeking, Experience Seeking, Disinhibition, and Boredom Susceptibility. The reliability of the SSS-V (Spanish version) was 0.77 (Perez & Torrubia, 1986).

Impulsiveness was assessed with the Barratt Impulsiveness Scale-11 (BIS-11; Patton, Stanford, & Barratt, 1995). It is a 30-item questionnaire with four response options. The items are grouped into three subscales: Attentional, motor, and nonplanning. Patton et al. (1995) reported internal consistency coefficients for the BIS-11 total score that range from 0.79 to 0.83. We utilized the Spanish adaptation of Oquenda et al. (2001).

Pattern disorders were assessed in those youths aged 18 to 25 with the Millon Clinical Multiaxial Inventory III (MCMI-III; Millon, 1994); those youths aged 14 to 17 were administered the Millon Adolescent Clinical Inventory (MACI; Millon, Millon, Davis & Grossman, 1997), which assesses personality patterns, and with scales that are equivalent to those of the MCMI-III. With both questionnaires we assessed: Antisocial and aggressive pattern of personality (antisocial personality pattern is assessed with the Antisocial personality scale of MCMI-III and with the Unruly personality scale in MACI while the Aggressive personality pattern is assessed with the Sadistic scale of the MCMI-III and with the Forceful scale of the MACI). Aggressive personality pattern is considered by Millon and Davis (1998) as a subtype of antisocial personality pattern.

**Procedure**

This is a cross-sectional community-based epidemiological study in youths aged 14 to 25. It was carried out using random sampling, and the interviews were administered at respondents’ households and in leisure/ recreational venues of each city to guarantee adequate representativeness of lifetime use versus non-use of psychostimulants. Once we had obtained the non-users, and one part of users in households, the sample was completed in leisure and recreational venues, seeking people who ever used psychostimulants.

For the sampling, in the case of those interviewed at home, we randomly selected the streets in which the study would be carried out in each city, according to its number of inhabitants. In each street the number of interviews that
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**Analysis strategy**

To examine hypothesized associations between variables (Figure 1) we used SEM with Amos 19 statistical modeling software (SPSS, 2006). SEM allows us to test the relations of all variables and underlying constructs simultaneously. The major advantages of this approach are the ability to identify direct and indirect effects and the corresponding standard errors, examine the associations among multiple independent and dependent variables in the model simultaneously, and obtain indices of overall model fit.

The aim was assessing the complete model made up of all the variables used in this study: Personality traits (sensation-seeking and impulsiveness), perceived availability of cocaine and ecstasy, perception of risk involved in sporadic use of cocaine and ecstasy, legal substance use (tobacco and drunkenness), cannabis use and antisocial personality patterns (antisocial and aggressive personality patterns).

We used the maximum-likelihood method (Byrne, 2010) and three types of indices for rating the quality of the analysis: (1) Measures of absolute fit, such as the chi-squared statistic, the Goodness-of-Fit Index (GFI) and the Root Mean Square Error of Approximation (RMSEA); (2) measures of incremental fit, that is, the comparative fit with respect to the baseline model using the Adjusted Goodness-of-Fit Index (AGFI); and (3) measures of the model’s parsimony, using the Comparative Fit Index (CFI). In general, a model is considered to show good fit when chi-squared permits the acceptance of the null hypothesis in the fit to the data in small samples, the RMSEA is not higher than 0.10 (or more restrictively, than 0.08), and the GFI, CFI and AGFI approach 1 (Byrne, 2010; Ruiz, Pardo, & San Martin, 2010; SPSS, 2006).

### Results

Bivariate correlations among all measured variables are presented in table 1.

Results of the structural equation modeling analysis indicated that the fit was adequate, since all the indices exceeded the minimum acceptance level, except for the chi-squared statistic: \( \chi^2 / d.f. = 5.381; \) CFI = 0.960; GFI = 0.961; RMSEA = 0.061; AGFI = 0.936 (Table 2). The fact that \( \chi^2 / d.f. \) is so high may be because it is a statistic highly sensitive to sample size, so that with large samples (over 200 cases) it is easy to reject the null hypothesis when the model achieves good fit (SPSS, 2006; Tabachnick & Fidell, 2007).

All the relationships between factors were significant. As we can see in Figure 1, the latent variables provided a good explanation for their corresponding observable variables, since all the coefficients were above 0.70, with the exception of sensation-seeking, with a coefficient

### Table 1. Bivariate correlations among all measured variables.

<table>
<thead>
<tr>
<th>Drunkenness</th>
<th>Tobacco use</th>
<th>Cannabis use</th>
<th>Ecstasy use</th>
<th>Cocaine use</th>
<th>Perceived availability of cocaine</th>
<th>Risk of cocaine use</th>
<th>Risk of ecstasy use</th>
<th>Impulsiveness</th>
<th>Sensation seeking</th>
<th>Antisocial PP</th>
<th>Aggressive PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobacco use</td>
<td>0.52***</td>
<td>-</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Cannabis use</td>
<td>0.57***</td>
<td>0.58***</td>
<td>-</td>
<td></td>
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</tr>
<tr>
<td>Ecstasy use</td>
<td>0.27***</td>
<td>0.25***</td>
<td>0.38***</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cocaine use</td>
<td>0.33***</td>
<td>0.31***</td>
<td>0.49***</td>
<td>0.57***</td>
<td></td>
<td></td>
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<tr>
<td>Perceived availability of cocaine</td>
<td>-0.26***</td>
<td>-0.26***</td>
<td>-0.35***</td>
<td>-0.22***</td>
<td>-0.24***</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Perceived availability of ecstasy</td>
<td>-0.20***</td>
<td>-0.18***</td>
<td>-0.24***</td>
<td>-0.21***</td>
<td>-0.16***</td>
<td>0.75***</td>
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<td></td>
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<tr>
<td>Risk of cocaine use</td>
<td>-0.13***</td>
<td>-0.15***</td>
<td>-0.22***</td>
<td>-0.23***</td>
<td>-0.33**</td>
<td>0.08**</td>
<td>0.07*</td>
<td>-</td>
<td></td>
<td></td>
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<tr>
<td>Risk of ecstasy use</td>
<td>-0.06</td>
<td>-0.08*</td>
<td>-0.14**</td>
<td>-0.27***</td>
<td>-0.20***</td>
<td>0.06*</td>
<td>0.11***</td>
<td>0.63***</td>
<td>-</td>
<td></td>
<td></td>
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<tr>
<td>Impulsiveness</td>
<td>0.16***</td>
<td>0.19***</td>
<td>0.26***</td>
<td>0.28***</td>
<td>0.27***</td>
<td>-0.17***</td>
<td>-0.14***</td>
<td>-0.26***</td>
<td>-0.18***</td>
<td>-</td>
<td></td>
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<tr>
<td>Sensation seeking</td>
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<td>0.28***</td>
<td>0.42***</td>
<td>0.33***</td>
<td>0.31***</td>
<td>-0.19***</td>
<td>-0.15**</td>
<td>-0.21***</td>
<td>-0.16***</td>
<td>0.43***</td>
<td>-</td>
</tr>
<tr>
<td>Antisocial PP</td>
<td>0.23***</td>
<td>0.25***</td>
<td>0.35***</td>
<td>0.38***</td>
<td>0.38***</td>
<td>-0.20***</td>
<td>-0.15**</td>
<td>-0.23***</td>
<td>-0.19***</td>
<td>0.60***</td>
<td>0.45***</td>
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<tr>
<td>Aggressive PP</td>
<td>0.17***</td>
<td>0.21***</td>
<td>0.28***</td>
<td>0.31***</td>
<td>0.31***</td>
<td>-0.16***</td>
<td>-0.10***</td>
<td>-0.19***</td>
<td>-0.15***</td>
<td>0.55***</td>
<td>0.35***</td>
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</table>

*p < 0.05; **p < 0.01; ***p < 0.001.

PP = Personality patterns.
of 0.61. Regarding the predictions, personality traits was a predictor of the use of both legal substances ($\beta = 0.46; p < .001$) and cannabis ($\beta = 0.15; p < .001$), as well as personality patterns ($\beta = 0.83; p < .001$). Perceived availability of cocaine and ecstasy ($\beta = -0.08; p < .01$) and perceived risk of sporadic cocaine and ecstasy use ($\beta = -0.27; p < .001$) were significant in the prediction of psychostimulant use. Furthermore, the use of legal substances was significant in the prediction of cannabis use ($\beta = 0.73; p < .001$), which was in turn significant in the prediction of psychostimulant use ($\beta = 0.39; p < .001$). Finally, personality patterns were significant in the prediction of psychostimulant use ($\beta = 0.30; p < .001$). Thus, all of these variables explained 52.5% of the variance of psychostimulant use, with cannabis use and antisocial personality patterns being the variables that best predicted cocaine and ecstasy use, followed by perceived risk and perceived availability.

With the aim of analyzing whether there were differences according to gender in the prediction of psychostimulant use with the proposed model, we conducted a multi-group analysis to compare males and females. This model showed good fit ($\chi^2$/d.f. = 3.05; CFI = 0.958; GFI = 0.951; RMSEA = 0.042; AGFI = 0.929 (Table 2).

The same model was assessed using multi-group analysis to assess differences by three age groups (14-17, 18-21, and 22-25). We observed that the fit was acceptable ($\chi^2$/d.f. = 3.164; CFI = 0.919; GFI = 0.914; RMSEA = 0.044; AGFI = 0.891) (Table 2).

**Discussion**

According to the literature, we selected important variables related to psychostimulant use (cocaine and ecstasy) to design a predictive model with structural equation modeling analysis, capable to predict the use of these substances in youths aged 14 to 25.

The final model suggests that high scores in impulsiveness and sensation-seeking predict tobacco use, cannabis use, and drunkenness, similar to other studies (Hampson, Andrews, & Barckley, 2008; Kubicka et al., 2001; Magid, MacLean, & Colder, 2007). In turn, the use of these substances predicts psychostimulant use (cocaine and ecstasy) in line with what the Gateway Hypothesis states (Kandel, 2002). It should be pointed out that, as noted in previous studies such as that of Van Gundy & Rebello (2010) about the Gateway Hypothesis, the relationship between the use of substances such as alcohol and tobacco and the subsequent use of psychostimulants is mediated by other factors in explaining the escalation of drug use.

In our study, high impulsiveness and sensation-seeking also predict the presence of antisocial and aggressive personality patterns. As we pointed out at the introduction, antisocial personality pattern is characterized by the presence of impulsiveness (American Psychiatric Association, 2000), and aggressive personality pattern is considered by Millon and Davis (1998) as a subtype of antisocial personality pattern. Moreover, the presence of antisocial and aggressive patterns predicts cocaine and ecstasy use. This result goes in line with other studies carried out with users of these substances who seek treatment, which conclude that antisocial personality pattern is very common among cocaine users (López & Becoña, 2006b). This is important because if we find those youths who have these personality patterns, we can prevent...
future problems with drug use that could lead to a future demand of treatment.

We can confirm that cannabis use and antisocial personality patterns in the model are the elements that best predict cocaine and ecstasy use, but there are two variables which, despite having less weight, are also significant in the prediction: Perceived availability of cocaine and ecstasy and perceived risk associated with the use of these substances.

If youths perceive that it is easy to access to a certain substance, this increases the likelihood of using this substance (Degendhart et al., 2008). The perception of negative consequences associated with cocaine and ecstasy use is also an important variable for predicting their use: If youths consider unlikely that they will suffer negative consequences of using cocaine and ecstasy they are more likely to use them. For example, in the case of cannabis, studies that examine prevalence of use over the years point to a clear relationship between its use and perceived risk (Degendhart et al., 2008).

If we focused on the differences between genders, we can say that even if the best predictors of psychostimulant use are cannabis use and antisocial personality patterns in both male and female, in females cannabis use and antisocial personality patterns have a greater weight than in males. The number of females who use cannabis (European Monitoring Centre for Drugs and Drugs Addiction, 2010), and have antisocial personality disorders (American Psychiatric Association, 2000) is less in comparison to males. So that the women that are cannabis users and have antisocial personality patterns at the same time should be a focus of attention given the greater probability of using other drugs (as psychostimulants) in these women.

In conclusion, we present a model that predicts, using a small number of variables (personality traits, antisocial personality patterns, perceived availability, perceived risk, legal substance use, and cannabis use), lifetime cocaine and ecstasy use in people aged 14 to 25. Until now we knew, as mentioned at the introduction, that all these variables were related to drug use. The present study indicates the way in which these variables predict cocaine and ecstasy use among youths and the relationship among them. Therefore, the model presented here can be seen as a useful tool for developing preventive strategies and for identifying those youths that are at risk for problems related to drug use. And as Brook, Pahl, & Rubenstone pointed out: “There is a growing recognition of the importance of identifying trajectories that define the progression of substance use in particular subgroups users over a span of time.” (pp. 35, 2008).

Among the limitations of the present study, we should mention the type of instruments we used for the assessment of the variables, the number of rejections that happened, and that it is a descriptive study. Carrying out longitudinal studies and the use of biological tests to determine substance use are two aspects that could be considered in future research. However, the sample size and the use of relevant variables in the prediction of psychostimulant use are two factors that lend robustness to the present study.

Acknowledgment

This research was supported by Xunta de Galicia, Servicio Galego de Saúde (SERGAS) by a cooperation agreement between Xunta de Galicia-SERGAS and University of Santiago de Compostela, Spain.

Competing interest

All authors declare they do not have conflict of interest.

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