Chemical Dependence and Personality

Carlos Henrique Sancineto da Silva Nunes[1]
Maiana Farias Oliveira Nunes
Tatiana Freitas da Cunha
Universidade São Francisco, Itatiba, Brazil
Claudio Simon Hutz
Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil

Abstract

This study investigated the relationships between chemical dependency and personality structure in a Brazilian sample. Participants were college students (n=35) and patients of a drug recovery center (n= 48). Two personality scales based on the Big-5 Model were used to measure Extraversion and Agreeableness. A semi-structured interview was used to identify events in the patients' life histories that might support specific classifications. Participants' scores were also compared to Brazilian normative samples. The results showed significant differences between clinical and non-clinical groups in Agreeableness, but not in Extraversion. Logistic regression analyses were conducted using scales and interview aspects for predicting group membership. The model showed 92.1% general predictive power. Results pointed to the advantage of using both interview and objective techniques to assess individuals with antisocial personality symptoms.
Keywords: Chemical addiction; drug use; Big Five Personality Model; psychological assessment.

Dependência Química e Personalidade

Resumo

Este estudo investigou as relações entre dependência química e estrutura da personalidade em uma amostra brasileira. Os participantes eram estudantes universitários (n=35) e clientes de um centro para tratamento de drogadictos (n=48). Duas escalas de personalidade, baseadas no Modelo dos Cinco Grandes Fatores, foram usadas para avaliar Extroversão e Socialização. Uma entrevista semi-estruturada foi usada para identificar eventos nas histórias de vida dos pacientes que pudessem apoiar classificações específicas. Os escores dos participantes também foram comparados a amostras normativas brasileiras. Os resultados mostraram diferenças significativas em Socialização entre o grupo clínico e o não-clínico, mas não para Extroversão. Análises de regressão foram realizadas com as escalas e dados da entrevista para predizer a que grupo o participante pertencia. O poder preditivo do modelo foi de 92,1%. Os resultados apontam para a vantagem de utilizar entrevistas e técnicas objetivas para avaliar sintomas de personalidade anti-social.
Palavras-chave: Adição química; uso de drogas; Modelo dos Cinco Grandes Fatores; avaliação psicológica.

Chemical dependency has been the topic of many studies in the areas of physiology, medicine, psychology, and social work. A great deal of attention has been paid to attempting to explain why people become addicts (Henderson & Galen, 2003) and to the various aspects which may contribute to addiction, such as genetic, social, biological and unique individual variables related to personality, intelligence and life experience. Still, the results of the research are inconclusive. The trajectory, which leads to substance abuse and chemical addiction, is multifaceted and extremely complex (Allan, 1995; Schuckit & Hesselbrock, 1996).

To understand this trajectory, it is first necessary to define chemical addiction. The World Health Organization lists several important characteristics for use in diagnosing individuals as chemically dependent. If three or more of the following characteristics are evident, then an individual can be defined as substance dependent. These characteristics include: (a) strong desire or compulsion to use a particular substance; (b) difficulty controlling consumption of a particular substance, in terms of frequency, occasion, and amount; (c) inability to abstain from use even when such use is inappropriate; (d) development of tolerance for the substance, such that increased quantities become necessary to sustain the

[1] Address: Universidade São Francisco, Campus Itatiba, Rua Alexandre Rodrigues Barbosa, 45, Itatiba, SP, Brasil, CEP 13251900. Tel.: (11) 4534 8046. *E-mail*: carloshnunes@mac.com

same effects; (e) lack of interest in areas of life that are not related to use of the substance; and, (f) continued use of the substance despite negative consequences of such use.

In studies of individuals in group homes for the chemically dependent, personality has been considered an important variable in explaining the condition (Ballone, 2005). Ball (2002) recommended the use of personality scales when evaluating chemically dependent individuals to provide additional information related to understanding the etiology, severity of symptoms and responsiveness to treatment. Many studies associate substance abuse with depression, anxiety, and anti-social personality disorders (Chambless, Cherney, Caputo, & Rheinstein, 1987; Grant & Harford, 1995; Helzer & Pryzbeck, 1988; Hesselbrock, Meyer, & Keener, 1985; Kessler et al., 1997; Merikangas et al., 1998; Merikangas & Swendsen, 1997; Regier et al., 1990). Although these studies show a strong correlation between substance dependence and such disorders (Allan, 1995; Schuckit & Hesselbrock, 1996), there are no models to explain this relationship. The wide variety of disorders related to substance dependence and the many different types of chemical dependency make it difficult to establish such a model. Merikangas et al. (1998) analyzed the results of six studies of substance use disorders conducted in the United States and Europe. Participants were 29,705 people between the ages of 14 and 64 from the general population. The DSM-III-R diagnostic criteria for personality disorders, depression, anxiety disorders, and conduct disorders were utilized. Higher levels of alcohol and drug use were correlated with increasing severity of symptoms. In all countries studied, psychiatric disorders became more pronounced with elevated substance use. Behavior disorders and anti-social personality disorders were associated with levels of substance use in all countries; however the relationship between substance abuse and depression and anxiety disorder varied from culture to culture.

Ballone (2005) conducted a meta-analysis of studies of personality disorders among the chemically-dependent. From study to study, the relationship between chemical dependency and personality disorder varies, but it is clear that personality disorders are more prevalent among the chemically dependent than among the general population. Among the various disorders investigated, anti-social personality disorder seemed to have the highest correlation with chemical dependence. Mulder (2002) reviewed the literature, highlighting studies conducted over the last decade that examined the association between alcoholism and personality, including those conducted with high-risk populations. Both longitudinal and epidemiological studies were included. Based on his review, he suggested that two personality characteristics seemed most associated with alcoholism. These were: (a) impulsivity and search for novelty; and, (b) neuroticism and negative mood. Although studies indicated men were at higher risk for alcoholism than women, these personality characteristics were more predictive of alcoholism than gender. Mulder (2002) contended that the presence or absence of anti-social personality or other personality disorders among alcoholics can generally be explained as the result of factors other than the substance use itself.

Longitudinal studies consistently show a relationship between hyperactivity, anti-social personality disorders and alcoholism. Epidemiological studies tend to show that personality and genetics exert the primary influence on the development of alcoholism. Among all types of studies, however, the strongest relationship with alcoholism appears among conduct disorders and anti-social personality disorders.

A research conducted in Argentina (Cassola, Pilatti, Alderete, & Godoy, 2005) identified beliefs about the effects of alcohol among adolescents. Aggressive behavior, illegal activity, difficulty with work and school, drug use, unprotected sex, unwanted pregnancy, and car accidents were all identified and highly associated to alcohol consumption. Interestingly, youth who reported consuming more alcohol also viewed these risks more positively. The authors hypothesized that these adolescents enjoyed taking risks, considering the high correlation between alcohol consumption and positive beliefs. A similar result was found by Jiménez e Bernal (2005) at Spain, who found that, as age increases at adolescence, people tend to be more permissive to taking risks associated to drug consumption and to highlight positive aspects of drug use.

Cooper, Agocha and Sheldon (2000) present a motivational model which tests the hypothesis that personality traits indirectly influence the development of risk for substance abuse, which can lead to substance dependency, by mediating the nature and quality of emotional experiences and by facilitating or hampering the development of specific coping styles. This model has been tested on 1,666 young adults between 18 and 25 years old. Results provide strong support for the model. Personality traits of neuroticism and extraversion are predictive of greater involvement in risky sexual behavior and alcohol use, although in different ways. Those with high levels of neuroticism are likely to become addicts in order to moderate depression and mood disorders, while those high in extraversion are likely to become involved with drugs and alcohol in search of social experiences and expression. These researchers conclude that personality traits influence both the motives for and the likelihood of at-risk behaviors, including alcohol and substance abuse.

The Big Five Model for Assessing Personality Traits. The five-factor model of personality assessment has been

widely used internationally to evaluate personality in the general population (Goldberg, 1990; McCrae & John, 1992). The NEO-PI-R (Costa & McCrae, 1992) is a commonly used measure, and it has also been used to identify psychopathology (Ben-Porath & Waller, 1992; Costa & Widiger, 2002; McCrae, 1991; Sharpe & Desai, 2001; Widiger & Trull, 1992). The developers of the test assert that it is useful in a clinical context. Specifically, McCrae (1991) proposes three ways in which it can be effectively used in this context: (a) to reveal interpersonal style, emotions and motivations; (b) to provide a holistic picture of the individual which is not necessarily available from more specific diagnostic tools; and, (c) to provide supplementary information that may allow clinicians to understand causes of behaviors and select appropriate treatments.

One of the clear benefits of the use of personality instruments to evaluate psychopathology is that the instruments are generally based on unidimensional categories often used in clinical diagnosis and are thus easy to interpret (Sharpe & Desai, 2001; Widiger & Frances, 2002). Research to develop these measures indicates that human personality can be understood as a series of points on a continuum; that there are specific universal elements or traits which make up all personality; individual differences are simply the points on each of these dimensions where a given individual is situated. Each trait may exist in low, moderate or high levels within a given individual.

Widiger, Trull, Clarkin, Sanderson and Costa (2002) present results of research on patients who were diagnosed with Histrionic Personality Disorder and those who were diagnosed with Anti-Social Personality Disorder. These groups of patients showed differences on the Big Five scales of Agreeableness and Extraversion. These differences occur frequently in the literature; high Extraversion and low Agreeableness scores are common among substance abusers, as well. It is worth noting that the Extraversion factor in the Big Five model is defined as the quantity and intensity of interpersonal relationships, the necessity for social stimulation and the happiness derived as a result. Individuals who score high on Extraversion tend to be sociable, talkative, active, optimistic and affectionate. Individuals who score low on Extraversion tend to be reserved (though not necessarily unfriendly), sober, detached, independent and quiet. Introverts are not necessarily pessimistic or unhappy, but they are not as exuberant or high-spirited as extraverts typically are (Costa & Widiger, 2002).

According to the Big Five model, Agreeableness, like Extraversion, is a continuous trait going from low (antagonistic to others) to high (compassionate and altruistic toward others). Individuals who score high on Agreeableness tend to be generous, affiliative, hard-working and self-sacrificing. They are helpful to others, responsive and empathetic. They identify with others and see themselves as a part of the group, and desire to help the group. People who are low in Agreeableness, on the other hand, tend to be cynical, manipulative, uncooperative irritable and vindictive (Costa & Widiger, 2002).

The present study utilized scales which were created, validated, and standardized in Brazil to measure Extraversion and Agreeableness factors. More specifically, patients in clinical settings were assessed to verify whether the trends apparent in the international literature regarding relationships between chemical dependence and personality structure are also evident in Brazil. Extraversion and Agreeableness were chosen to be used in this study they showed strong relationship to chemical dependency, even though the authors did not neglect the importance of the other three personality factors. In the procedure session, this choice will be detailed.

Method

Sample

The sample was comprised of individuals in two distinctive groups. The first group consisted of 48 inpatients in treatment for chemical dependency in a private health clinic, part of private health services in seven Brazilian states. Participants were 17 to 66 years of age (*M*= 31 years and *SD* =12 years), 43 were male and five were female. All the patients in the clinic were invited to participate in this research and their participation was voluntary. The clinical sample was mainly composed by men because of their most frequent adherence to this kind of treatment, which is also in agreement with statistical data from the World Health Organization. This sample size was obtained after one year of data collection.

The second group consisted of 35 university students, nine males and 26 females. Their mean age was 21 years (*SD* =2.5 years) who volunteered to participate in a research about personality scales and were interviewed later regarding their life histories as they were given the results of the tests. Students were invited to the interview in their classrooms, after completing the scales. Interviews were scheduled at that moment and took place in different days, according to the students' availability. About 54% of the students were from the state of Bahia, in the northeast of Brazil. The others were from the southeastern part of the country. This group is similar to the normative sample of the personality scales, regarding their age and gender and their interview results could allow for comparisons with the clinical group, important to verify the interview structure used and also to compare their results.

Additional analyses were performed using the results of the normative sample for the Extraversion and Agreeableness factors. The norm groups had 1,084 and 1,100 persons, respectively and were assessed at five different Brazilian states, from south, southeast and northeast of Brazil (Nunes, 2005). It should be pointed out that the two groups in the present study presented differences in age, gender, and number of years of instruction. However, the research to validate and standardize the scales in Brazil showed that there were no meaningful associations among the scales scores and these variables, except for gender (Nunes & Hutz, 2007a, 2007b). Therefore, the effects of gender were controlled in the present study because of the larger number of males in the sample.

Instruments

The participants from the treatment group and the university group completed the Extraversion Scale (Nunes & Hutz, 2007a) and the Agreeableness Scale (Nunes & Hutz, 2007b), and then responded to a semi-structured interview as the results of the scales were presented. Both scales were created in Brazil and used the Five Factor Model framework. They were approved by the Psychology Federal Council of Brazil, which is a legal instance that certifies the test's psychometric properties. The Extraversion and Agreeableness scales have adequate reliability coefficients (over 0,78 and 0,80, respectively) and present validity evidences regarding its internal structure and also by correlation with other related constructs. The Extraversion Scale consists of 57 items divided into four subscales designed to measure the following related constructs:

E1. Communicativeness. This factor describes how communicative an individual is. People who score high on this factor are likely to be comfortable with public speaking and tend to reveal information about themselves freely to new acquaintances. Widiger et al. (2002) and O'Conner and Dice (2002) indicate that Histrionic Personality Disorder is associated with high scores on this scale, while Schizoid Personality Disorder is associated with low scores on this scale.

E2. Haughtiness. This factor is comprised of items that measure an individual's perception of their own importance. O'Connor and Dyce (2002) and Widiger et al. (2002) indicate that people with Antisocial Personality Disorder and Narcissistic Personality tend to score high on this scale, while those with problems related to co-dependence (Dependent Personality) score low. The items on this subscale are specifically configured to assess these disorders as defined in the DSM-IV (American Psychiatric Association, 1994). Each of these disorders has demonstrated a relationship with the Big Five scales of Extraversion and Agreeableness (O'Connor & Dice, 2002; Widiger et al., 2002).

E3. Assertiveness. This factor is comprised of items to measure the characteristics of assertiveness, leadership and intrinsic motivation. Very low scores on these characteristics tend to be associated with Avoidant and Dependent disorders, while those with Obsessive-Compulsive Disorder score relatively high (O'Connor & Dyce, 2002; Widiger et al., 2002).

E4. Social Interaction. This factor describes how much an individual enjoys social interaction during group activities, parties and clubs. People who score high tend to be gregarious and devote attention to maintaining their social contacts. O'Connor and Dyce (2002) and Widiger et al. (2002) indicate that those with Histrionic Personality Disorder are likely to score high on this scale, while those with Schizoid and Avoidant disorders score low. Those with Antisocial disorders may seek fun, so their performance on this scale is less predictable.

The Agreeableness Scale is comprised of 70 items divided into subscales, which measure 3 factors. These subscales include:

A1. Kindness. This factor includes a group of items that measure how much an individual cares for others, how much attention is paid to the needs of others and empathy felt for others. It also measures politeness, consideration and moderation of opinions in order not to offend. O'Connor and Dyce (2002) and Widiger et al. (2002) indicate that those with Dependent disorders generally score very high on this scale, while those with Antisocial and Narcissistic disorders score quite low.

A2. Pro-Social Attitudes. The items in this group describe attitudes toward risk-taking, level of agreement with laws and social rules and morals. Aggressiveness and standards of alcohol consumption are also measured. O'Connor and Dyce (2002) and Widiger et al. (2002) indicate that Antisocial and Narcissistic disorders can be revealed by performance on this scale. McCormick and Smith (1995) indicate that addiction to various drugs (both legal and illegal) can also be revealed by this scale. Loukas, Krull, Chassin and Carle (2000) also claim that scores on this scale are frequently associated with drug and alcohol addiction.

A3. Confidence. This scale measures whether or not an individual believes that others are pleasantly disposed and supportive towards him. Those who score low on the scale frequently have difficulty with interpersonal relationships. They are frequently jealous in intimate relationships, and feel that others seek to harm them. O'Connor and Dyce (2002) and Widiger et al. (2002) indicate that Borderline, Schizoid and Paranoid disorders are characterized by low scores on this scale. Conversely, Histrionic and Dependent disorders are characterized by higher scores.

Semi-Structured Interview. Because the performance of individuals on the scales was insufficient to determine a particular psychological profile, participants were

also interviewed to find indications of specific events in their life histories that might support classifications such as antisocial or highly extraverted. The interview followed the same format for both groups to identify family relationships, school experiences, professional development, friendships, motivations and attitudes and general life events. Specific areas addressed included:

Social Aspects Which Reinforce or Maintain Addictions. Overall contextual events in the life of an individual that might encourage or maintain chemical addiction include a history of use among close family members, permissive parents, family structure, familial attitudes toward use vs. abstinence, patterns of consumption, stress level and access in the workplace to psychoactive substances.

Events Which Demonstrate Anti-Social Behavior. Antisocial behavior was revealed if specific instances of acting badly toward others were revealed. Examples included illegal activities such as robbery or murder, self-destructive behavior, destroying property, harming others, being verbally or physically abusive toward family members, theft, reckless driving and other acts of intentional destruction.

Tendencies Which Demonstrate Anti-Social Personality. Characteristics such as impulsivity, indifference about the feelings of others, dishonesty, manipulativeness, suspicion, feelings of aggression and a desire to harm others were included here.

Academic History. Events which occurred during school which indicated deviant behavior such as leaving school during the academic year, repeating grades, confrontational behavior with teachers or other students, failure to follow school rules, poor grades, suspension, expulsion and other behaviors not considered normally acceptable in a school setting were included here.

Work History. Aspects related to career, including changing jobs frequently, difficulty following rules, difficulty with supervisors or subordinates or inability to work effectively with others were included here.

Intimate Relationships. Quality of interaction in intimate relationships was assessed according to whether or not any or the following behaviors had occurred: physical or verbal aggression toward the partner, extreme jealousy, recurring conflicts, a pattern of separation and divorce, recurring infidelity, risky sexual behavior resulting in unwanted pregnancy or sexually transmitted diseases, and physical fights.

Procedure

The participants were evaluated individually by psychologists or psychology graduate students who had been trained to conduct the interviews and administer the scales appropriately. Each evaluation began by establishing rapport with the participant and explaining the purposes of the research. Next, informed consent was obtained from each of the participants and they were assured they could withdraw from the study at any time. For the clinical group, a schedule was established after the initial meeting to complete the assessments and the interview. For the students, interviews were completed after the tests were administered. The interview was conducted in a public area, and slight modifications were made for each of the two groups. They took approximately 40 minutes for both groups

Results

Participants' scores on the personality scales were converted to Z scores and the results were compared using *t*-tests. This procedure was adopted to eliminate possible gender bias. Table 1 compares the scores of the chemically-dependent sample with the Brazilian norms for each subscale (Nunes, 2005). As Table 1 shows, there were significant differences between the clinical sample and the college students sample on all of the subscales in Agreeableness. Factor A2, Pro-social Attitudes, showed the greatest difference, with the clinical sample scoring a full standard deviation below the control group. This replicates the results of international research, showing that high risk behavior, aggression, violation of social rules and confrontation with the law is more common among those in treatment for substance abuse. On factor A1, Kindness, the clinical group also scored significantly lower. Unlike what would be expected based on previous studies, however, no significant differences were found on the Extraversion scales.

Correlations between each subscale and the six areas assessed by the interview were also calculated for all participants and are shown in Table 2. All of the Agreeableness subscales were significantly negatively correlated with both Antisocial Behavior and Academic History. Scales A2 and A3 were also significantly negatively correlated with Social Aspects which maintained

Table 1

Results on Agreeableness and Extraversion Scales for Clinical Group in Treatment for Substance Abuse Compared to Normative Sample

Scale	Z Score	SD	t	p<	n
Kindness	-.78	1.25	1.13	.001	46
Pro-Social Attitudes	-1.00	1.24	6.57	.001	46
Confidence	-.49	.98	3.26	.001	46
General Agreeableness	-.95	1.18	6.26	.001	46
Communicativeness	.02	1.02	.12	ns	42
Haughtiness	-.04	1.00	.25	ns	42
Assertiveness	-.21	1.11	1.33	ns	42
Social Interaction	-.01	1.12	.06	ns	42
General Extraversion	-.08	.95	.51	ns	42

Table 2
Correlations between Interview Items, Agreeableness, and Extraversion Subscales - Brazilian Subjects

Interview areas	A1	A2	A3	AGR n=74	E1	E2	E3	E4	EXTR n =71
Antisocial behavior	-.23*	-.31**	-.32**	-.36**	-.07	-.10	-.03	.16	-.02
Maintenance of addictions	-.01	-.34**	-.33**	-.30**	-.18	-.16	-.01	.03	-.13
Antisocial personality	-.01	-.37**	-.33**	-.31**	-.03	.02	.15	.25*	.14
Academic history	-.32**	-.41**	-.47**	-.51**	-.21	-.09	-.16	.11	-.15
Work history	-.01	-.19	-.21	-.19	-.18	-.19	.20	.00	-.07
Intimate relations	-.03	.03	-.01	.00	-.11	-.16	.18	.14	.01

*Note. *$p< .05$;** $p < .01$.*

Table 3
Average Scores on Interview Items of Clinical Sample and University Students

Group		Antisocial behaviors	Antisocial personality traits	Academic history	Work history	Intimate relations	Aspects maintaining addiction
University students	$\overline{X}$	.47	.50	.82	.03	.47	.44
N=34	SD	.86	.90	.97	.17	.78	.34
Clinical sample	$\overline{X}$	3.38	1.52	2.88	.52	1.33	2.52
N=48	SD	2.28	1.85	2.26	.68	1.00	1.70

Note. All differences are significant ($p< .01$).

Addictive Behaviors and with Antisocial Personality tendencies. Work History and Intimate Relationships were not correlated with any of the subscales. There was a weak positive correlation ($p<.05$) between subscale E4 Social Interaction and Antisocial Personality Tendencies.

Table 3 compares the scores of the group of university students to the group in treatment for chemical addiction on the six interview items. Analysis of variance (ANOVA) was used to test for significant differences. Significant differences ($p< .01$) were evident on all areas measured by the survey. The university students performed quite differently in all areas of their lives as compared to the clinical sample. The lives of the clinical sample included far more involvement in situations related to violence and risk, family problems, difficulties with work colleagues and lifestyles that make it difficult to escape from addiction. This is not to say that such events are completely absent from the lives of the students, but these events and tendencies are far less common among that group. Since most university students in Brazil have not worked, the work history measure may be less relevant than the other measures. Age and developmental level could also have exerted some influence on experiences reported in the interviews. But, overall, it appears clear that members of the clinical sample report more

antisocial acts and tendencies and more difficulties with relationships than the student group.

To verify the results of the Agreeableness and Extraversion scales and the interview items as indicators of risk for chemical dependence, a logistic regression analysis was performed to assess the scores. This procedure verified the efficacy of the model, showing the predictive value of the scales. Note that all scales were entered in the equation, but Table 4 shows only those scales for which a main effect was present. Utilizing scores on the Agreeableness Scale, the Extraversion Scale and interview items related to school history, antisocial acts and intimate relationships as independent variables, it is possible to predict whether or not a given subject is in the chemically dependent group. Table 5 shows the degree of certainty to which these items predict group membership.

It is important to note that the chemically dependent group was coded as "1" and the university student group was coded as "0". It is also important to note that not all participants in the total samples responded to all items on all scales. Those who did not, were dropped from this analysis. Order of entry could also have influenced the resultant equation. As Table 4 shows, A1 Kindness was the principal subscale on the Agreeableness instrument that distinguished group placement. On the

Table 4
Logistic Regression Analysis of Scales and Items against Group

Independent variable	B	Error	Wald	DF	p <	Exp(B)
Kindness	-.57	.55	1.09	1	.30	.56
Communicativeness	-1.38	.65	4.57	1	.03	.25
Academic history	.49	.44	1.23	1	.27	1.62
Antisocial acts	1.48	.61	5.88	1	.02	4.37
Intimate relationships	.28	.57	.24	1	.62	1.32
Constant	-3.28	1.06	9.65	1	.01	.04

Table 5
Accuracy of Predictions of Group by Model Tested

Prediction of group by model			
Cases observed	University students	Chemically dependent	% cases predicted
University students	31	2	93.9
Chemically dependent persons	3	27	90.0
Overall total			92.1

measure of Extraversion, E1 Social Interaction was the predictive subscale. On the interview, Antisocial Acts, Academic History and Intimate Relationships were the predictive items. As indicated in Table 5, the general predictive capacity of this model was 92.1% of available cases. Specifically, 90% of the chemically dependent subjects and 93.9% of the university students could be placed in the correct group based only upon the scores on these five measures. Of the 30 clinical cases assessed, 27 were accurately placed. Of the university students, 31 of the 33 cases could be accounted for by this regression model.

Discussion

It is, of course, difficult to understand the ways in which these results explain chemical dependence. Are the social and lifestyle factors that lead to stress and dependency, or are the personality tendencies that determine lifestyle? Likely, the process is interactive. Regardless, the members of the clinical sample in this study were far more likely to identify instances of antisocial behavior in their life histories as revealed by the interview. This finding is in agreement with the results of Widiger et al. (2002), which showed an association between Agreeableness and substance dependency, and also with Merikangas et al. (1998), who concluded that Anti-social behaviors are the most

consensual symptoms related to substance abuse or dependency. Participants in the clinical sample were also far more likely to report difficulties in school and at work, problems with relationships, and social surroundings that made it difficult to give up substance abuse. All of these have implications for treatment, stressing the importance of environmental as well as personality factors.

The results of the logistic regression analysis reinforced the importance of using objective scales to measure personality characteristics (see also Ball, 2002), as an effort to obtain a broader picture of the patients most common ways to interpret what happen to them and how they interact with people. It is also evident the usefulness of using a semi-structured interview in conjunction with personality scales.

This study verified the predictive values of kindness and communication level in determining substance dependency problems. These results can be understood from different perspectives. On the one hand, this demonstrates the importance of gathering information from standardized psychological tests when conducting clinical assessment, as many others have suggested (Anastasi & Urbina, 2000). On the other hand, this corroborates findings from the international literature suggesting that some personality traits are associated with chemical dependency (Ball, 2002; Ballone, 2005; Cooper et al., 2000; Mulder, 2002; Widiger et al., 2002).

Information gathered from the interview showed that those who were chemically dependent were far more likely to experience interpersonal problems in relationships and to be involved with violence and other risky situations. This could be explained by the interaction of the personality tendencies revealed. It could be hypothesized that the clinical group, because of their tendencies to manipulate others and not consider their needs (antisocial tendencies), were more likely to experience problems at school, in the workplace and in intimate relationships. The results do indicate that the findings from international studies showing that personality traits

are a factor in chemical dependence, particularly anti-social personality tendencies (Ball, 2002; Ballone, 2005; Cooper et al., 2000; Mulder, 2002; Widiger et al., 2002) also apply in Brazil.

In addition to shedding light on the phenomenon of chemical dependency in Brazil, and its association with specific personality traits, this research also helped to accumulate criterion validity evidence for the Brazilian Big Five scales of Agreeableness and Extraversion for use in clinical assessment. As recommended by the American Educational Research Association, the American Psychological Association and the National Council on Measurement in Education ([AERA, APA, & NCME], 1999), this research contributed to the understanding of the meaning of this assessment in a particular context, thus increasing the validity of the measurement. It also showed the utility of these measures for use in clinical contexts. Even with a small sample size, the measures were very effective in predicting chemical dependence, as can be seen in Tables 4 and 5.

This study also reinforced the importance of gathering relevant information from life history, as was demonstrated in the interview, as well as utilizing appropriate and valid personality assessment tools when treating patients for substance abuse problems in clinical settings. These findings also reiterate the importance of the national and international recommendations of Anastasi and Urbina (2000) to consider multiple factors in treatment based on information gathered from psychological tests, life histories, observations and other relevant sources.

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Carlos Henrique Sancineto da Silva Nunes. Mestre e doutor em Psicologia pela Universidade Federal do Rio Grande do Sul (UFRGS). Atualmente é professor auxiliar concursado doutor da Universidade São Francisco vinculado ao Programa de Pós-Graduação em Avaliação Psicológica e colaborador com atividades de pesquisa da UFRGS.

Maiana Farias Oliveira Nunes. Mestre em Avaliação Psicológica pela Universidade São Francisco – Itatiba. Atualmente é doutoranda da Universidade São Francisco – Itatiba.

Tatiana Freitas da Cunha. Mestre em Avaliação Psicológica pela Universidade São Francisco (bolsista Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - CAPES).

Claudio Simon Hutz. Mestre e doutor em Psicologia pela University of Iowa. Atualmente é Professor Titular da UFRGS.