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# The Brazilian-Portuguese MCMI-III: Diagnostic Validity of the Alcohol Dependence and Drug Dependence Scales

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# THE BRAZILIAN-PORTUGUESE MCMI-III: DIAGNOSTIC VALIDITY OF THE ALCOHOL DEPENDENCE AND DRUG DEPENDENCE SCALES

**by**

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## DISSERTATION APPROVAL SHEET

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### THE BRAZILIAN-PORTUGUESE MCMI-III: DIAGNOSTIC VALIDITY OF THE ALCOHOL DEPENDENCE AND DRUG DEPENDENCE SCALES

**by**

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The Brazilian-Portuguese Millon Clinical Multiaxial Inventory-III (BP-MCMI-III) is a newly developed translation of the original MCMI-III and requires validation before it can be used in cross-cultural research and clinical settings. This study was the first validation study with the BP-MCMI-III and examined the validity of its Alcohol Dependence and Drug Dependence scales for identifying substance-related disorders in a Brazilian sample.

The diagnostic validity of these scales was examined by comparing participants' scores on the BP-MCMI-III against group status (controls versus patients receiving substance abuse treatment) and against clinical diagnoses made based on a DSM-IV-TR symptom checklist. In addition, diagnostic validity statistics were also computed for both scales. The construct validity of the Alcohol Dependence scale was examined by comparing the subjects' scores with their performance on a Brazilian version of the Alcohol Use Disorders Identification Test (AUDIT).

The total sample used in this study consisted of 126 Brazilians residing in the metropolitan area of Rio de Janeiro, Brazil. Of the total sample, 75 were inpatients at treatment facilities for substance abuse and 51 were not receiving treatment for alcohol-

or drug-related problems at the time of testing. The results of this study supported the validity of the BP-MCMI-III for diagnosing substance-related disorders among Brazilians.

# CHAPTER I

## Statement of the Problem

A Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III) was developed to be used in future studies that will examine cross-cultural aspects of personality and psychopathology in Brazil and the United States. The initial phases of this project were conducted by this researcher and her associates, and involved the completion of four preliminary steps in cross-cultural test adaptation: (1) the translation phase, which included a series of procedures used to maximize translation accuracy and readability; (2) a pilot test-retest study, which evaluated item equivalency using a bilingual sample; (3) the revision phase, which involved further refinement of problem-items; and (4) a preliminary reliability study, which evaluated the psychometric properties of the new version with data collected in Brazil. The results of these studies were encouraging and suggested that the translated instrument is psychometrically reliable and comparable to the original MCMI-III. Stability coefficients for all scales were above .6 and significant at .001 level with the Brazilian sample. The methodological procedures for the translation, as well as the results of the bilingual test-retest and the preliminary reliability study, were summarized in two unpublished manuscripts (Magalhaes, Magalhaes, Sellers & Lewis, 1999; Magalhaes, Magalhaes, Sellers, Lewis, Cruz, & Corga, 2004). See Appendices A and B.

Although test translations used in research and clinical practice are often developed in casual and unsystematic ways, the literature offers several guidelines for developing quality translations; that is, translations that retain comparable item content and psychometric properties with the original instrument and assess the constructs of interest

with the same or similar degree of accuracy (Bracken & Barona, 1991; Geisinger, 1994; Butcher, 1996a; Butcher, 1996b; Butcher & Hans, 1996; Sperber, Devellis, & Boehlecke, 1994; Van de Vijver, F., & Hambleton, R. K., 1996). Suggested procedures include not only a multistep translation process, like the one described above for the BP-MCMI-III, but also a series of validation studies that can offer support for the usefulness of the translated instrument for assessing constructs of interest in the target population. The argument is that even if the test itself remains unchanged after being translated (linguistically and psychometrically speaking), there is no guarantee that it assesses the same construct in a different culture or that the new version continues to provide scores that can be interpreted in the same manner it was proposed for the original version.

To date no validation studies have been conducted to evaluate the usefulness of the BP-MCMI-III for assessing psychopathology in the Brazilian population. The BP-MCMI-III, like the original MCMI-III, has a total of 27 subscales: (a) 3 for estimating the individual's test-taking attitude, (b) 14 for measuring different personality styles, and (c) 10 for assessing the presence of clinical syndromes (Millon, 1997). Because the BP-MCMI-III is expected to measure several constructs at the same time, its validation is clearly a complex task and requires a systematic approach.

The validity studies reported in the MCMI-III manual involved the participation of several clinicians who administered the test on their own clients. These clinicians then rated the presence or absence of various personality traits and symptoms of clinical syndromes for each client based on their knowledge of Millon's theory of personality and psychopathology and the 4$^{th}$ edition of the Diagnostic and Statistical Manual of Mental Disorders criteria (DSM-IV; American Psychiatric Association, 1994). Familiarity with Millon's theory

was considered to be an important characteristic of the raters because some personality patterns assessed by the instrument can not be easily identified using the DSM-IV criteria only. The following is a section included in the Rating Reference Booklet provided to participating clinicians:

> "*Our view here is that personality is not expressed only in the cognitive, or behavioral, or psychodynamic, or interpersonal realms, but is instead manifested across all of these clinical domains, and that the DSM is markedly incomplete with regard to its sampling of many domains of clinical expression. You should attempt to use both DSM and Millon criteria when making your personality rating decisions.*" (Millon, 1997, p. 90).

Since the use of raters trained on Millon's theoretical approach was not feasible at this time, this investigator selected two clinical syndrome scales – the Alcohol Dependence and Drug Dependence scales – to be the focus of this study. Unlike the personality scales, the MCMI-III clinical syndrome scales were expected to correspond more directly to the current diagnostic nomenclature with which most clinicians and researchers are familiar – the DSM-IV-TR. Diagnosis made based on DSM-IV-TR criteria could then serve as a "gold standard" to which diagnosis made based on the MCMI-III could be compared.

The decision to select the substance dependence scales for this study, among other clinical syndrome scales, was based primarily on this investigator's clinical interest in the field of substance abuse and on the relative ease of gathering clinical data on this clinical population. Although several instruments for assessing alcohol and drug use are available, the MCMI-III is unique in that it provides the opportunity for assessing addictive behaviors

in the context of personality styles and general psychopathology. The results of this study will provide relevant information regarding the validity of the BP-MCMI-III for assessing substance use problems in the Brazilian population.

# CHAPTER II

## Review of the Literature

### *Principles of Test Validation*

The validity of a test is defined simply as an estimate of how well the test measures what it is supposed to measure. Thus, procedures for determining validity typically involve ways of understanding the relationship between a subject's performance on the test and his performance on some other measure or measures of the same characteristic (the criterion) being studied.

The literature describes several types of validity and several methods for estimating validity. A common procedure, *content validation*, involves evaluating the extent a test measures a representative sample of all characteristics of the domain being assessed. Although content validity is expected to be built into a test from its development (through the choice of appropriate items), it can never be assumed. Potential threats to content validity include the following: (a) test items may not cover all major aspects of the domain being assessed, (b) test items may cover all aspects but not in the correct proportions, or (c) some items may be irrelevant. Procedures to ensure content validity are usually fairly simple. They involve consultations with experts who provide information on the importance of specific characteristics that need to be assessed with the test and a systematic examination of the test items to see if they cover all relevant aspects identified by the experts (Anastasi & Urbina, 1997).

Content validity is considered to be of major importance for evaluating the usefulness of tests that measure a person's skill or knowledge of a certain topic, such as with achievement tests. However, Anastasi and Urbina (1997) stated that content

validation alone is usually inappropriate, or even misleading, for personality tests due to the fact that these tests may not necessarily bear any resemblance to the behavior domain they hope to sample. Because personality tests are typically developed based on a researcher's theory, it may be impossible, just by looking at the content of the items, to determine what is really being measured. Thus, in the case of personality inventories such as the BP-MCMI-III, construct-identification procedures are considered to be of greater relevance.

*Construct validity* refers to the extent a test appropriately measures a construct or a trait that is theoretically defined and typically involves the gradual accumulation of evidence from a variety of sources. Because any given psychological construct can be operationalized in various ways, different gauges (single test items) can be created, each assessing different aspects of the construct and none fully capturing the almost infinite number of descriptive variables associated with that construct. For example, alcohol dependence can be measured directly or indirectly (depending on how it is theoretically defined) by assessing frequency of drinking days, amount of alcohol consumed on a typical drinking day, frequency and severity of relationship problems caused by drinking, amount of time spent drinking, frequency of impulsive behavior in various situations, ability to effectively cope with stressful situations, or level of occupational functioning, just to name a few associated variables. Given that psychological constructs are complex theoretical entities, it is reasonable then to expect that any single study aiming at establishing construct validity of an instrument must fail to fully capture its multifaceted nature (Davis, Wenger & Guzman, 1997). Correlations with other tests (criterion measures), factor analysis, internal consistency, convergent and discriminant validation,

and structural equation modeling procedures are some of the methods usually employed to evaluate construct validity (Anastasi & Urbina, 1997; Millon, 1997).

Another type of validity, *criterion-predictive validity*, refers to how well a subject's performance on a test predicts his performance in the future in some other measure. Although this method is especially appropriate for tests used in the selection of individuals for jobs or educational programs (e.g., predicting how well a person would perform certain tasks at a new job), it may also be used to predict clinical outcome; for example, to evaluate an individual's probability of benefiting from one form of treatment versus another. A broader definition of criterion-predictive validity can also include evaluating how well a test can predict a person's performance on another measure that is administered concurrently or predict the person's inclusion on a particular category (e.g., a diagnosis), in which case the time factor (predicting into the future) would not be relevant (Anastasi & Urbina, 1997).

### *Diagnostic Validity Indices*

A special form of predictive validity, *diagnostic validity*, is considered to be an important characteristic of a diagnostic tool such as the MCMI and will be the primary focus of this proposed study. The diagnostic validity or efficiency of a test is typically measured in terms of the test's operating characteristics, which include prevalence, sensitivity, specificity, positive predictive power, negative predictive power, and overall diagnostic power (Retzlaff, 1996; Retzlaff & Gibertini, 1994).

*Prevalence* is estimated based on a particular sample composition and is calculated by dividing all disordered cases (true and false positives) by the number of subjects in the sample. For practical purposes, prevalence refers to the probability that a

particular person has the disorder the test measures before any further information is known.

*Sensitivity* refers to how well a diagnostic instrument detects a particular disorder or a cluster of symptoms; in other words, how sensitive a test is in the presence of the disorder. Sensitivity is calculated by dividing the number of cases identified by the test as having a disorder (test positives) by the total number of cases having the disorder (including true positive cases not identified by the test). Although considered a very important operating characteristic, sensitivity alone tells us very little about the validity of a diagnostic instrument. For example, a test can be highly sensitive (able to identify 100 percent of true positive cases in a particular sample) and, at the same time, misdiagnose several cases, finding pathology when it does not exist (false positives).

*Specificity,* on the other hand, refers to the degree to which a test detects a specific disorder and excludes other pathologies; that is, whether the test is specific enough to identify as positive those cases that truly have the disorder. Specificity is calculated by dividing the number of cases not identified by the test as having the disorder (including true and false positives) by the total number of true negative cases. Thus, if we frame the operating characteristics of a test in terms of conditional probabilities, specificity can be defined as the probability that the test is negative given the disorder is absent, whereas sensitivity would be the probability that the test is positive given the disorder is present (Gilbertini, Brandenburg, & Retzlaff, 1986).

Specificity and sensitivity are usually considered to be independent of the prevalence of the disorder in the sample; in other words, a test should identify the same proportion of disordered cases across samples. However, calculating these two indices

requires that one knows which cases in the sample really have the disorder the instrument is supposed to detect. Therefore, sensitivities and specificities are dependent on the accurate classification of subjects into appropriate diagnostic categories.

*Positive predictive power* (PPP) is defined as the proportion of positive cases that actually have a disorder and it is equal to the number of true positives divided by the number of test positives. *Negative predictive power* (NPP) is the proportion of individuals identified as negative cases that in fact do not have the disorder. This index is calculated by dividing true negatives by test negatives. Both predictive power indices are influenced by the prevalence of the disorder in the population and the magnitude of the sensitivity and specificity of the test. Generally speaking, these indices are optimal when sensitivity and specificity are above 90%. However, even a very good test (a test with high sensitivity and high specificity) loses positive predictive power when prevalence falls below 10% (Gilbertini, Brandenburg, & Retzlaff, 1986). In addition, in the absence of good specificity, positive predictive power and sensitivity tend to be inversely related. That is, when the sensitivity of an instrument increases, false positives increase, and positive predictive power declines (Millon, 1997).

Compared to specificity and sensitivity, predictive power indices are considered more useful to the practitioner making decisions about individual patients but are often not reported in test manuals because the data necessary to determine them is rarely collected. According to Gilbertini, Brandenburg, and Retzlaff (1986), "the following are needed: (a) an empirically based estimate of the prevalence of the disorder in the population on which the test will be used, (b) the valid assignment of patients to diagnostic categories, and (c) an independent administration of the test to the selected

sample." The assignment of sample patients to groups (criterion b) can also serve as the estimation procedure for population prevalence (criterion a), but the administration of the test under consideration must be conducted independently from the assignment process (criterion c).

Lastly, *overall diagnostic power* (DxP) is a global index of a test's overall classification accuracy. Generally speaking, this index is a combination of the two predictive power indices and reflects the proportion of correctly classified subjects according to the presence or absence of a disorder. Although often reported in test manuals, high overall diagnostic power can be very misleading because it is possible to have a high overall diagnostic power even when the number of false positives and false negatives are greater than the number of true positives, especially when the prevalence of the disorder is low (Gilbertini, Brandenburg, and Retzlaff, 1986).

Although used less frequently in the MCMI literature, five additional measures of diagnostic validity should also be discussed in this section. These are the Incremental Validity of Positive Test Diagnoses, the Incremental validity of Negative Test Diagnoses (INPP), Cohen's Kappa, Cohen's Effect Size, and Area Under ROC Curves.

The *Incremental Validity of Positive Test Diagnoses* (IPPP) is the difference between a scale's positive predictive power and the prevalence of the disorder in the sample. Even though some experts in the field have emphasized the importance of positive predictive power over other validity measures (Retzlaff, 1996; Millon, 1997), Hsu (2002) pointed out that this diagnostic index has some limitations and should be interpreted with caution. His argument is that in the absence of any correlation between test scores and a disorder, positive predictive power is expected to be equal to prevalence

(Gibertini et al., 1986; Kraemer, Kazdin, Offord, Kessler, Jensen, & Kupfer, 1999; both cited in Hsu, 2002). Thus, one can say that diagnoses made by the test are preferable to diagnoses assigned randomly only when positive predictive power is greater than prevalence. IPPP then provides a measure of how much better than chance a test makes a diagnosis. IPPP values range from zero to plus or minus 1.0, with zero indicating that test-based positive diagnoses are equal to chance and the maximum value of 1.0 indicating that the test produces no diagnostic errors. Negative values indicate that test-based classifications are worse than chance.

Similarly to IPPP, the *Incremental Validity of Negative Test Diagnoses* (INPP) provides a measure of how much better than chance a test correctly identifies cases without the disorder; and it is defined as the difference between a scale's negative predictive power and the prevalence rate of patients not having the disorder. INPP values also range from zero to plus or minus 1.0, with zero indicating that test-based negative diagnoses are equal to chance and 1.0 indicating that the test is 100 percent valid in detecting no pathology. Negative values indicate that test-based classifications are worse than chance (Retzlaff, 2000; Hsu, 2002).

Although best known as a measure of interrater agreement, *Cohen's Kappa* can also be used as a measure of the combined incremental validities of positive and negative test diagnoses (IPPP and INPP) relative to random assignment of diagnoses. That is, it can compare the proportion of correct positive and negative test-based diagnoses to the proportion of correct positive and negative diagnoses made by chance. Similarly to IPPP and INPP, maximum value of Cohen's Kappa is 1.0. Negative values indicate that test-based diagnoses are worse than chance, zero indicates it is equal to chance, and 1.0

indicates that diagnoses (positive and negative) are 100 percent accurate (Hsu, 2002; Huck, 2000).

It should be noted that Cohen's Kappa, predictive power indices (PPP and NPP), and incremental validities of positive and negative test diagnoses (IPPP and INPP) are affected by prevalence and base rates. Thus, values for these diagnostic validity measures tend to vary greatly depending on the characteristics of the sample used to derive data. *Cohen's Effect Size* (d) is independent from prevalence and base rates, and can serve as a measure of the relative ability of a test to discriminate between groups.

Lastly, the *Area Under ROC (receiver operating characteristic) Curves*, also known as AUC, has been recently recognized in the literature as another measure of diagnostic validity that is free from the effects of prevalence and cut-scores. ROC analysis is part of a field called "Signal Detection Theory" and was originally developed during World War II for the analysis of radar images (Tape, 2004). Advantages of AUC are its simplicity and generalizability (McGraw & Wong, 1992; cited in Hsu, 2002). Both Cohen's *(d)* and AUC are considered robust to moderate violations of the normality and homogeneity of variance assumptions (Hanley, 1988; McFall & Treat, 1999; McGraw & Wong, 1992; cited in Hsu, 2002).

### *Validation of the MCMI Substance Dependence Scales*

This section will review the methodological procedures and research findings that support the validity of the substance dependence scales for the three generations of the MCMI. The reason for discussing the three MCMI versions, rather than simply focusing on the latest, is that, according to Millon (1997), validity of each newer version is largely supported by the validity of the previous.

***Content Validity***

According to Millon (1997), validation of the MCMIs was accomplished in three stages. The first stage, *theoretical-substantive*, addressed content validity, by examining the extent the items that make up the various scales derived their content from Millon's theory of personality and his definitions of clinical syndromes (Millon, 1981). The Alcohol Dependence scale was designed to detect individuals who have a history of alcoholism, had tried to overcome the problem with minimal success, and are experiencing difficulties in the family and work setting as a result of drinking. Similarly, the Drug Dependence scale was designed to detect individuals with recurrent or recent histories of drug abuse, who are finding it difficult to restrain their impulses to use/abuse drugs, and are unable to manage the consequences of their behavior. Many subtle and indirect items were included in both scales in an attempt to identify individuals who were not ready to admit their substance use problems. Millon's rationale for including these scales in the MCMI was to provide the opportunity for studying an individual's substance use problems in the context of his overall personality style (Millon, 1997).

***Reliability***

The second validation stage, *internal-structural*, first examined the internal consistency of the various scales and selected the items that maximized scale homogeneity. Each scale was expected to have a high degree of internal consistency, display a considerable overlap with some of the other scales, and demonstrate satisfactory levels of endorsement frequency and reliability over time. In the case of the MCMI-III, a research form was initially developed, consisting of the 175 items from the MCMI-II and 150 new items, which together made up a larger item pool from which item selection for

the MCMI-III was made. Endorsement rates for each of the 325 items were examined to ensure that it fell within an acceptable range, and items with very high or very low endorsement frequencies were eliminated. Several statistics were then computed and recomputed simultaneously as items were added or removed from their respective scales. This process allowed for the identification of the best item composition for each scale based on statistical and substantive criteria. Chronbach's alphas (N = 398) and test-retest correlation coefficients (N = 87) were calculated for the resulting scales, which now comprise the MCMI-III. The Chronbach's alphas obtained for the Alcohol and Drug Dependence scales were .82 and .83, respectively. Test-retest reliability coefficients for these scales were .92 and .91. Table 1 presents the results for all scales.

**Table 1**
*Length, Internal Consistency, and Test-Retest Reliability of the MCMI-III Scales*

| | | Number of Items | Internal Consistency[a] | Test-Retest Reliability[b] |
|---|---|---|---|---|
| **Clinical Personality Patterns** | | | | |
| 1 | Schizoid | 16 | .81 | .89 |
| 2A | Avoidant | 16 | .89 | .89 |
| 2B | Depressive | 15 | .89 | .93 |
| 3 | Dependent | 16 | .85 | .89 |
| 4 | Histrionic | 17 | .81 | .91 |
| 5 | Narcissistic | 24 | .67 | .89 |
| 6A | Antisocial | 17 | .77 | .93 |
| 6B | Sadistic (Aggressive) | 20 | .79 | .88 |
| 7 | Compulsive | 17 | .66 | .92 |
| 8A | Negativistic | 16 | .83 | .89 |
| 8B | Masochistic | 15 | .87 | .91 |
| **Severe Personality Pathology** | | | | |
| S | Schizotypal | 16 | .85 | .87 |
| C | Borderline | 16 | .85 | .93 |
| P | Paranoid | 17 | .84 | .85 |
| **Clinical Syndromes** | | | | |
| A | Anxiety | 14 | .86 | .84 |
| H | Somatoform | 12 | .86 | .96 |
| N | Bipolar: Manic | 13 | .71 | .93 |
| D | Dysthymia | 14 | .88 | .91 |
| B | Alcohol Dependence | 15 | .82 | .92 |
| T | Drug Dependence | 14 | .83 | .91 |
| R | Post-Traumatic Stress Disorder | 16 | .89 | .94 |
| **Severe Clinical Syndromes** | | | | |
| SS | Thought Disorder | 17 | .87 | .92 |
| CC | Major Depression | 17 | .90 | .95 |
| PP | Delusional Disorder | 13 | .79 | .86 |
| **Modifying Indices** | | | | |
| X | Disclosure | NA | NA | .94 |
| Y | Desirability | 21 | .86 | .92 |
| Z | Debasement | 33 | .95 | .82 |

[a]Cross-Validation Sample (N = 398)
[b]Test-Restest Interval = 5-14 days (N = 87)

### *Base Rate Development*

Unlike most tests, the MCMI uses Base Rate (BR) scores, instead of T scores, to transform raw data into interpretable information. Created through criterion referencing (not norm referencing), BR scores are anchored to the prevalence rate of personality characteristics and clinical syndromes in the psychiatric population. Consistent with

Millon's theory of personality, the MCMI assumes that the difference between a clinical disorder and normal functioning is a matter of degree rather than kind; that is, traits and symptoms are viewed in a continuum (Millon, 1981; Millon, 1997).

Base Rate development was completed also during the *internal-structural stage* of the test's validation process. First, the target prevalence of each of the characteristics represented by 24 clinical scales were established "by calculating the proportion of times clinicians rated each trait as a client's most prominent problem (the *prominent* prevalence rate) or as present but not as prominent as the first (the *present* prevalence rate)" (Millon, 1997; pg. 60). For the 11 scales measuring clinical personality patterns, two additional prevalence rates were calculated: the *trait* prevalence rate, indicating the proportion of time clinicians rated each personality pattern as a trait; and the *disorder* prevalence rate, indicating the proportion of time personality patterns were rated as disorders. These prevalence rates were then adjusted based on results of various epidemiological studies to develop the final criteria used to create the BR scores. The anchoring of BR scores was accomplished by determining the equivalence of a BR score of 0 to a raw score of 0, a BR of 60 to the median raw score, and a BR of 115 to the maximum attained raw score. Cut-off scores were determined as follows: scores of 75 and above indicate the presence of a trait or clinical syndrome; while scores of 85 and above indicate the presence of a disorder or prominence of a syndrome. Table 2 shows BR transformations for the Alcohol Dependence (B) and Drug Dependence (T) Scales.

**Table 2**
*BR Transformations for the Alcohol Dependence (B) and Drug Dependence (T) Scales*[a]

| Raw Score | BR Scale Scores | | | |
|---|---|---|---|---|
| | Males | | Females | |
| | B | T | B | T |
| 0 | 0 | 0 | 0 | 0 |
| 1 | 15 | 15 | 25 | 25 |
| 2 | 30 | 30 | 60 | 60 |
| 3 | 45 | 45 | 61 | 62 |
| 4 | 60 | 60 | 62 | 63 |
| 5 | 65 | 62 | 63 | 64 |
| 6 | 70 | 63 | 64 | 65 |
| 7 | 75 | 65 | 68 | 66 |
| 8 | 77 | 67 | 70 | 67 |
| 9 | 79 | 68 | 71 | 68 |
| 10 | 81 | 70 | 75 | 70 |
| 11 | 83 | 72 | 78 | 75 |
| 12 | 85 | 73 | 80 | 80 |
| 13 | 88 | 75 | 82 | 85 |
| 14 | 92 | 78 | 85 | 91 |
| 15 | 95 | 82 | 90 | 97 |
| 16 | 98 | 85 | 95 | 103 |
| 17 | 102 | 92 | 100 | 109 |
| 18 | 105 | 98 | 105 | 115 |
| 19 | 108 | 104 | 110 | 115 |
| 20 | 112 | 110 | 115 | 115 |
| 21 | 115 | | 115 | |

[a]Millon (1997).

### *Diagnostic Validity of the original MCMI*

Evidence of the MCMI value as a diagnostic tool was gathered in the third and final validation stage – the *external-criterion* stage. The diagnostic validity of the first MCMI was estimated based on a study with 978 psychiatric patients with mixed diagnoses. According to Millon (1983), the results of this study indicated that the Alcohol Abuse and Drug Abuse scales were effective in detecting individuals with substance abuse histories. McMahon, Flynn, and Davidson (1985), in a study involving repeated administrations of the MCMI throughout treatment, found that scores on the substance

abuse scales in fact remained significantly elevated over time (whereas other scales were less stable), indicating that the MCMI was able to detect the subjects' substance abuse histories independent of current use.

While the Alcohol Abuse and Drug Abuse scales were found to be generally elevated among substance abuse patients in some studies (Flynn & McMahon, 1984; Stark & Campbell, 1988; McMahon, Flynn, and Davidson, 1985), other investigators questioned the MCMI substance abuse scales' diagnostic value and raised concern about the content of the scale items and the independence of these scales. In a study with 561 psychiatric inpatients, using the standard base-rate cutoff score of 75, Bryer, Martines, Dignan (1990) found that subjects who scored positive for substance abuse by the test, more often than not, did not have the substance-abuse history that the particular scale had predicted. They explained their findings by calling attention to the fact that the MCMI Alcohol Abuse scale had only 7 out of 31 questions with specific alcohol abuse content and the Drug Abuse scale had 5 out of 46 items with drug content.

In a study with opiate-addicts, Marsh, Stile, Stoughton, and Trout-Landen (1988) found that only 49% of clinical cases in their sample had significant elevations on the Drug Abuse scale. With college students, Jaffe and Archer (1987) found that MCMI Alcohol Abuse scale was more effective in detecting drug abuse than was the Drug Abuse scale. They explained their findings by pointing out a large intercorrelation between the two scales ($r = .65$), a very different number than the one originally reported by Millon ($r = -.08$; Millon, 1983).

Wetzler (1990) wrote an article reviewing all major studies with the first MCMI and offered a possible explanation for the poor diagnostic efficiency that was implied by

these studies. He noted that studies that used structured-interview based criterion diagnoses generally found adequate diagnostic efficiency for the MCMI, while those that used diagnoses given by psychiatrists during their standard clinical evaluations found poor diagnostic efficiency. His conclusion was that, despite its shortcomings, the MCMI was probably a better diagnostician that the average clinician.

With regards to the instrument's operating characteristics, the first MCMI manual reported only sensitivity and specificity values (Millon, 1977). The full set of operating characteristics of the scales were later calculated and reported by Gilbertini, Brandenburg, and Retzlaff (1996). The overall diagnostic power (DxP), specificities (Spec) and negative predictive powers (NPP) were found to be generally high; while sensitivities (Sens) and positive predictive powers (PPP) varied greatly (sensitivities ranged from 15% to 91% and PPPs from 19% to 84%). See Tables 3 and 4 for values concerning the alcohol Abuse and Drug Abuse scales.

**Table 3**
*Operating Characteristics of the MCMI Substance Abuse Scales (BR > 74)*

| Scale | Prevalence | Sensitivity | Specificity | PPP | NPP | DxP |
|---|---|---|---|---|---|---|
| Alcohol Abuse | 17 | 74 | 91 | 63 | 95 | 88 |
| Drug Abuse | 11 | 78 | 96 | 71 | 97 | 94 |

**Table 4**
*Operating Characteristics of the MCMI Substance Abuse Scales (BR > 84)*

| Scale | Prevalence | Sensitivity | Specificity | PPP | NPP | DxP |
|---|---|---|---|---|---|---|
| Alcohol Abuse | 12 | 56 | 96 | 66 | 94 | 91 |
| Drug Abuse | 6 | 52 | 98 | 63 | 97 | 95 |

***Diagnostic Validity of the MCMI-II***

Released in 1987, the MCMI-II retained most of the items that were part of the original MCMI scales, although both substance abuse scales contained new items. Similarly to the MCMI, the MCMI-II substance abuse scales had few items with obvious drug and alcohol content (Bryer et al., 1990). The two scales had 25 items in common and were reported to have an intercorrelation of .76 (Millon, 1987). Millon's response to those who criticize the MCMI for its high scale intercorrelations has always been one; that the scales overlap is consistent with his theory and that it was intentionally built into the test to account for the complex nature of the constructs being measured (Millon & Millon, 1997; Wetzler, 1990). For example, the two substance dependence scales are expected to measure different but similar constructs, since individuals with alcohol and drug problems are likely to have tried to overcome their substance abuse problem with minimal success and experience difficulties in the family and work setting as a result of the addiction.

Despite the MCMI and MCMI-II recognized overall diagnostic validity (Gibertini, 1993), Fals-Stewart (1995) alerted clinicians to the effect of defensive responding (i.e., fake-good) on the instrument's substance abuse scales. He compared the scores of substance abuse patients who were asked to respond honestly with those asked to respond defensively and also with forensic subjects suspected of abusing psychoactive substances. The results indicated that, even though most MCMI-II items comprising the substance abuse scales do not directly concern alcohol and drug use, most people motivated to deny substance abuse can avoid detection. He concluded then that, in

situations when individuals may feel compelled to hide substance abuse symptoms, validity of the MCMI-II substance abuse scales may be threatened.

Three studies provided initial support for the validity of the MCMI-II at the time of its release. These studies examined the extent to which scale scores corresponded to diagnoses made by clinicians in accordance with the revised 3rd edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; American Psychiatric Association, 1987) criteria. Based on the results of these studies, Millon reported that both the Alcohol Dependence and Drug Dependence scales corresponded extremely well with a diagnosis of alcohol dependence and drug dependence. Their overall diagnostic power was estimated to be 97% and 94%, respectively (Millon, 1997). Patients diagnosed with alcohol dependence were reported to also show elevations on Antisocial and Aggressive scales in Study 1 (N = 20) and on Schizoid and Drug Dependence scales in studies 2 and 3 combined (N = 43). Patients diagnosed with drug dependence also scored high on the Alcohol Dependence and Antisocial scales (N = 25 in study 1; N = 53 in study 2 and 3 combined). A full set of operating characteristics for all scales was reported in the MCMI-II manual, showing higher positive predictive powers (ranging from .30s to .80s) than those found with the MCMI (Millon, 1987; cited in Retzlaff, 1996).

***Diagnostic Validity of the MCMI-III***

Even though Millon claims that the studies conducted with the three generations of the MCMI can offer support for the validity of its last version (Millon, 1997), there is disagreement with regards to what extent the MCMI-III is comparable to the MCMI-II. Some researchers believe that the MCMI-III is sufficiently different and should be considered a separate instrument (Marlowe, Festinger, & Kirby, 1998; Rogers, Salekin, &

Sewell, 1999). In fact, in the case of the substance abuse scales, significant changes were made in the number of items. The Alcohol Dependence scale contained 31 items in the original MCMI, 46 in the MCMI-II, and only 15 on the MCMI-III. The Drug Dependence scale consisted of 46 items in the MCMI, 58 in the MCMI-II, and only 16 on the MCMI-III.

The validity studies reported in the MCMI-III manual used a similar procedure to the one used with the MCMI-II; patients' scale scores were compared with diagnoses made by clinicians on the basis of the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) criteria (Millon, 1994; cited in Millon 1997). Only prevalences, sensitivities, specificities and test positives were initially made available by the test developers. However, using the data provided in the test manual, Retzlaff (1996) ran a more complete analysis of the operating characteristics of the MCMI-III and found overall lower PPPs than those obtained for the MCMI-II, raising a concern that the instrument had lost its diagnostic properties. See Table 5.

**Table 5**
*The 1994 Study: Prevalence, Sensitivity, Specificity, and Predictive Power Values for the MCMI-III Substance Abuse Scales*[a]

| Scale | Prevalence | Sensitivity | Specificity | PPP | NPP |
|---|---|---|---|---|---|
| Alcohol Abuse | 12.40 | 72.70 | 85.80 | 42 | 96 |
| Drug Abuse | 8.20 | 51.70 | 94.80 | 47 | 96 |

[a]Retzlaff (1996).

Considering that the MCMI-III remained very similar to the MCMI-II in terms of its overall scale composition and reliability, Retzlaff (1996) argued that the poor results were more likely due to a faulty validity study than to a poorer test. He pointed out several methodological problems in the 1994 study, including limitations of the diagnostic criteria employed (e.g., clinicians were asked to make diagnoses based on the new DSM-IV criteria, which was unavailable at the time), the superficial level and low frequency of contact between clinical judges and patients (e.g., clinicians diagnosed cases with as low as one clinical contact), and the diversity in purposes of the study (the validity study was mixed-in with the item-selection study), among other problems.

In response to Retzlaff's article, MCMI developers carried out a new validity study with the MCMI-III in an attempt to replicate the conditions under which the MCMI-II study was conducted (e.g., in the new study, raters had to have seen the patients for at least three therapeutic sessions and had to have a good understanding of the patient's clinical features and personality characteristics before making a diagnosis). The revised MCMI-III manual (Millon, 1997) described the methodology used in this study and provided a comparative table of diagnostic efficiency statistics across the three generations of the MCMI (see Tables 6 and 7 for the Alcohol Dependence and Drug Dependence scales statistics). According to the test developers, specificities and NPPs were not reported due to the fact that these statistics tend to be grossly inflated for the MCMI because of the number of scales included in the calculations (Millon, 1997; Davis, Wenger, & Guzman, 1997). Nevertheless, Retzlaff (2000) calculated NPPs with the new data and found that they were all equal or greater than .94. Overall, values for the diagnostic validity statistics for the second study were found to be much higher than

those derived from the first, suggesting that the 1994 study underestimated the diagnostic value of the MCMI-III (Millon, 1997; Retzlaff, 2000).

**Table 6**
*The 1997 Study: Comparative Table of the Operating Characteristics of the Three Generations of the MCMI Substance Abuse Scales at BR equal or higher than 75*[a]

| | Prevalence Rates | | | Sensitivity | | | Positive Predictive Power | | |
|---|---|---|---|---|---|---|---|---|---|
| | M-I | M-II | M-III[b] | M-I | M-II | M-III[b] | M-I | M-II | M-III[b] |
| Alcohol Abuse | 17 | 15 | 30 | 74 | 87 | 86 | 63 | 92 | 83 |
| Drug Abuse | 11 | 13 | 19 | 78 | 72 | 92 | 71 | 82 | 89 |

[a]MCMI-III values were calculated from data obtained in the 1997 study (Millon, 1997).
[b]Statistic calculated using all disorders judged by clinicians as present.

**Table 7**
*The 1997 Study: Comparative Table of the Operating Characteristics of the Three Generations of the MCMI Substance Abuse Scales at BR equal or higher than 85* [a]

| | Prevalence Rates | | | | Sensitivity | | | | Positive Predictive Power | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M-I | M-II | M-III[b] | M-III[c] | M-I | M-II | M-III[b] | M-III[c] | M-I | M-II | M-III[b] | M-III[c] |
| Alcohol Dependence | 12 | 8 | 30 | 17 | 56 | 79 | 65 | 80 | 66 | 88 | 91 | 88 |
| Drug Dependence | 6 | 9 | 19 | 11 | 52 | 62 | 78 | 82 | 63 | 78 | 92 | 93 |

[a]MCMI-III values were calculated from data obtained in the 1997 study (Millon, 1997).
[b]Statistic calculated using all disorders judged by clinicians as present.
[c]Statistic calculated using disorders judged by clinicians as most prominent.

After reviewing the methodology and results of these two MCMI-III validity studies, Hsu (2002) concluded that the 1994 study, despite its limitations, provided a better appraisal of the validity of the MCMI-III. He argued that even though the 1997 study overcame the major limitation of the 1994 study (lack of familiarity of clinicians

with patients), it did not provide adequate control for "*criterion contamination, confirmatory bias, or availability heuristics*;" thus, providing an overestimation of the validity of the MCMI-III. According to Hsu (2002), a major methodological flaw of the 1997 study is that, in order to obtain a large clinical sample, clinicians were encouraged to include subjects who had already taken the MCMI-III. Although they were asked not to include those patients for whom they had a clear recollection of MCMI-III scores, it is hard to believe that prior knowledge of patients profiles did not influence their clinical judgment; "after all, it is precisely this type of information that clinicians would be expected to pay attention to and remember, especially if they believed that the MCMI-III scale elevations yielded useful clinical information" (p. 420). In addition, clinicians were provided with a single rating form to enter both their clinical ratings of the patients' symptoms and traits and the subjects' MCMI-III scores. Thus, even if clinicians had no clear recollection of the patients' scores at the time of the study, having to enter these scores on the same form they recorded diagnoses may have biased their clinical judgment.

In the same article, Hsu (2002) also discussed the importance of diagnostic validity indices used less frequently in the MCMI literature that make adjustments for chance agreement of scale scores and for inability of a scale to discriminate between groups (IPPP, INPP, Cohen's Kappa, Cohen's Effect Size, and AUC). He demonstrated that, if consideration had been given to these indices, different conclusions about the 1994 study would have been reached. In spite of the importance researchers traditionally place on PPPs, Hsu (2002) argued that low PPPs do not imply worse-than-chance diagnoses. In fact, based on the 1994 data, he found that 20 out of the 24 MCMI-III

scales performed better-than-chance. With regards to the substance abuse scales, IPPP and INPP values were .296 and .084 for Alcohol Dependence; and .388 and .042 for Drug Dependence, respectively. Cohen's Kappa for the Alcohol Dependence scale was .454, and .465 for the Drug Dependence scale. Effect sizes were above 1.5 for both scales. Diagnostic validity values based on the 1997 study were much higher than values based on the 1994 study but should be interpreted with caution due to possible overestimation. See Table 8 for values reported by Hsu (2002).

**Table 8**
*Comparative Table of the 1994 and 1997 Additional Diagnostic Validity Values for the MCMI-III Alcohol and Drug Dependence Scales*[a]

| | PPP | | IPPP | | INPP | | Cohen's *k* | | Cohen's *d* | | AUC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1994 | 1997 | 1994 | 1997 | 1994 | 1997 | 1994 | 1997 | 1994 | 1997 | 1994 | 1997 |
| Alcohol Dependence | .420 | .88 | .296 | .71 | .084 | .13 | .454 | .81 | 1.68 | 2.85 | .882 | .98 |
| Drug Dependence | .470 | .93 | .388 | .82 | .042 | .09 | .465 | .86 | 1.67 | 3.34 | .881 | .99 |

[a]Hsu (2002).

Although several independent studies provided additional information on the validity of the original MCMI substance abuse scales, only one independent study with substance abusers was conducted with the MCMI-III (Craig, 1997). This study reported sensitivity and specificity rates for the Alcohol Dependence and Drug Dependence scales with a sample of 164 substance misusers from an inpatient drug treatment and rehabilitation program. All subjects met diagnostic criteria for opiate or cocaine dependence and 80 percent of the sample had a concurrent diagnosis of alcohol abuse or alcohol dependence. The results showed an overall sensitivity level of .80 for the Alcohol

Dependence scale and .82 for the Drug Dependence scale. Because prevalence of drug use was 100 percent, no specificity and NPP values for the Drug Dependence scale were obtained with this sample. Specificity for the Alcohol Dependence scale was .59 and NPP was .62. PPP values were 1.0 for Drug Dependence and .84 for Alcohol Dependence. Because all subjects in this sample were in treatment for substance abuse (prevalence was 100 percent for drug abuse and 80 percent for alcohol abuse), the high PPP values obtained for both substance abuse scales are not surprising.

***Concluding Remarks***

The Millon Clinical Multiaxial Inventory is considered to be one of the major personality inventories in the United States, having spawned more than 600 papers since its first publication in 1977. Overall, the instrument is considered to be a well-designed and psychometrically stable inventory, distinguishing itself from a number of comparable tests currently available in the market (Aiken, 1997; Groth-Marnat, 2003). The instrument's success among clinicians and researchers is due to its several distinguishing features, including relative brevity (when compared with similar personality inventories such as the Minnesota Multiphasic Personality Inventory - MMPI), strong theoretical basis, simplicity of administration and scoring, multiaxial format, and consonance with the DSM-IV (Choca & Van Denburg, 1997; Craig, 1997, Millon, 1997).

With regards to its usefulness for detecting substance abuse problems, the MCMI is unique in that it provides the opportunity for assessing addictive behaviors in the context of personality styles and psychopathology. Millon's theory predicts that clinical syndromes, such as substance abuse or dependence, tend to emerge under periods of greater stress and are often reflective of disturbances in underlying personality patterns. A discussion of

personality clusters associated with substance abuse is beyond the scope of this proposed study. For a review of the literature on this topic, please refer to Choca and Van Denburg, 1997; and Flynn and McMahon, 1997.

## *Cross-Cultural Applications of the MCMI*

### *The Challenges of Cross-Cultural Assessment*

The field of cross-cultural psychology has grown considerably over the last several decades, raising awareness among clinicians and researchers of the need for the development of culturally-sensitive assessment practices (Aponte & Crouch, 2000; Dana, 2000). Recognition of the impact of sociocultural factors in intelligence, personality, psychopathology and other constructs of interest to psychologists has led to efforts to develop psychological instruments guided by one of two underlying approaches: (a) one that seeks to create universal definitions of normality and abnormality, and to develop instruments that measure those universal constructs (etic perspective); or (b) another that regards culture as an inseparable factor in the development of individuals' characteristics, and argues in favor of creating instruments that are culture-specific (emic perspective) (Dana, 1988; see Helfrich, 1999, for a more complete discussion on the etic-emic controversy).

Undoubtedly, both methods have limitations and can not easily resolve the challenges of multicultural and cross-cultural assessment. While the emic approach seems ideal in that it emphasizes the need for understanding individuals in their social context, it also implies the need for the development of an inordinate number of instruments for a given construct, one from within each existing culture. Aside from the enormous expense involved in the development of multiple tests, a major limitation of

this method is the fact that it makes it impossible for researchers and clinicians to compare an individual's or cultural group's performance cross-culturally (Samuda, 1998). On the other hand, the etic approach also poses its own set of problems for assuming the existence of universal truths, which some argue may be too difficult to find or even impossible to separate from the always-present influence of culture in human behavior (van de Vijver & Poortinga, 1991; cited in Dana, 1988).

***MCMI Translations***

Despite the trend for developing culture-specific instruments (Dana, 1987; Dana, 2000) and many methodological problems involved in the development of high quality test translations (Bracken & Barona, 1991; Butcher, 1996a; Geisinger, 1994; van de Vijver & Poortinga, 1991; van de Vijver & Hambleton, 1996), translations of psychological measures continue to be widely used and offer a less-than-ideal but functional solution to the challenges of multicultural assessment in the context of both cross-cultural research and culturally-sensitive clinical practice. Because the translation process of an instrument is a costly and time-consuming task, the literature advises that care should be exercised in selecting for translation only tests that are theoretically sound, psychometrically reliable, and demonstrate adequate validity in the original language.

The MCMI clearly meets these criteria. In addition to being generally recognized as a reliable and valid instrument, the MCMI has a strong theoretical foundation. In his evolutionary and ecological theory of personality, Millon proposed that human behavior is directed by three "motivating aims," which he defined as the bipolar dimensions of *pleasure-pain*, *active-passive*, and *self-other* (Millon, 1990; Millon, 1994; cited in Escovar, 1997). According to Millon, individual organisms are born with the potential for

developing certain traits based on their genetic makeup, but "over time the salience of these trait potentials become differentially prominent as the organism interacts with its environment" (Millon, 1990, p. 22). Although a full discussion of Millon's theory is beyond the scope of this study, it is important to note that his model for understanding human behavior parallels similar models used to explain differences between cultural groups and has been recognized as having the potential for helping to elucidate cross-cultural questions (Escovar, 1997).

The literature indicates that several MCMI translations have been developed and are currently being used in many other countries (Groth-Marnat, 2003); however, with the exception of a translation into Dutch-Flemish developed for use in the Netherlands and Belgium (Luteijn, 1990; Mortensen & Simonsen, 1990; Sloore & Derksen, 1997), no other information was found regarding international applications of the MCMI.

With regards to the Dutch-Flemish MCMI validity for diagnosing substance abuse, a study comparing patients' scores on the translated MCMI and translated MMPI (N=52) found a correlation of .51 for the MCMI Alcohol Abuse scale and the MMPI McAndrew scale. A correlation of .58 was found for the MCMI Drug Abuse scale and the MMPI McAndrew scale (Sloore & Derksen, 1997).

### *Purpose of the Study*

The purpose of this study was to provide a preliminary appraisal of the usefulness of the Brazilian-Portuguese version of the MCMI-III (BP-MCMI-III) for cross-cultural applications. More specifically, this study examined the validity of the BP-MCMI-III Alcohol Dependence and Drug Dependence scales for detecting substance abuse/dependence problems in a Brazilian sample composed of clinical and non-clinical

subjects. The focus was on evaluating the diagnostic validity of these scales by comparing participants' group status (patients receiving substance abuse treatment versus controls) against diagnoses made on the basis of the test (Hypothesis 1 and Hypothesis 2), and by comparing diagnoses made on the basis of the DSM-IV-TR against diagnoses made on the basis of the test (Hypothesis 3 and 4). In addition, the construct validity of the Alcohol Dependence scale was examined by comparing the subjects' scores on the BP-MCMI-III against scores on the AUDIT (Hypothesis 5). Because this investigator did not find a concurrent measure of drug abuse/dependence in Portuguese that could be used in this study, the concurrent validity of the Drug Dependence scale was not tested.

***Hypothesis 1***

It was expected that clinical subjects would have a significantly higher raw and base rate score than controls on the Alcohol Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III), when clinical and control groups were defined based on whether individuals were receiving or not receiving treatment for alcohol-related problems at the time of testing.

***Hypothesis 2***

It was expected that clinical subjects would have a significantly higher raw and base rate score than controls on the Drug Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III), when clinical and control groups were defined based on whether individuals were receiving or not receiving treatment for drug-related problems at the time of testing.

***Hypothesis 3***

It was expected that individuals diagnosed with alcohol abuse or dependence based on DSM-IV-TR criteria would have a significantly higher raw and base rate score than controls on the Alcohol Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III).

***Hypothesis 4***

It was expected that individuals diagnosed with drug abuse or dependence based on DSM-IV-TR criteria would have a significantly higher raw and base rate score than controls on the Drug Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III).

***Hypothesis 5***

It was expected that there would be a significant positive correlation between participants' scores on the Alcohol Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III) and scores on the Alcohol Use Disorders Identification Test (AUDIT).

***Post Hoc Analyses***

The following questions regarding indices of diagnostic validity were answered:

(1) What is the sensitivity of the BP-MCMI-III Alcohol and Drug Dependence scales?

(2) What is the specificity of the BP-MCMI-III Alcohol and Drug Dependence scales?

(3) What is the Positive Predictive Power (PPP) of the BP-MCMI-III Alcohol and Drug Dependence scales?

(4) What is the Negative Predictive Power (NPP) of the BP-MCMI-III Alcohol and Drug Dependence scales?

(5) What is the Overall Diagnostic Power (DxP) of the BP-MCMI-III Alcohol and Drug Dependence scales?

(6) What is the Incremental Validity of Positive Test Diagnoses (IPPP) of the BP-MCMI-III Alcohol and Drug Dependence scales?

(7) What is the Incremental Validity of Negative Test Diagnoses (NPPP) of the BP-MCMI-III Alcohol and Drug Dependence scales?

(8) What is the value of Cohen's Kappa for the BP-MCMI-III Alcohol and Drug Dependence scales?

(9) What is Cohen's Effect Size for the BP-MCMI-III Alcohol and Drug Dependence scales?

(10) What is the Area Under the ROC curve for the BP-MCMI-III Alcohol and Drug Dependence scales?

Furthermore, diagnostic validity indices for the Brazilian version of the AUDIT used in this study were computed as they have not yet been reported in the literature.

# CHAPTER III

## Method

### *Participants*

#### *Clinical Participants*

Clinical participants were contacted through two substance abuse treatment facilities in Rio de Janeiro, Brazil – Clínica Pater-Aldeia and Primeira Clínica Popular do Estado do Rio de Janeiro (see the Procedures section for details about how subjects were recruited). They were invited to participate in this study by responding anonymously to the assessment materials. All potential participants were fully informed about the purpose of the investigation, the procedures involved, the risks and benefits associated with their participation, and their right to withdraw from the study at any time. They were assured that their answers would be kept confidential and those who agreed to participate were asked to sign an Informed Consent Form (See Appendixes C and D). The criteria for inclusion were: (1) subject's willingness to participate; (2) being above eighteen years of age; and (3) being in inpatient or outpatient treatment for alcohol/drug abuse or dependence at the time of testing.

A total of 75 patients receiving substance abuse treatment responded to the assessment materials. Twenty-three patients were receiving treatment due to alcohol related disorders only, 12 due to drug related disorders only, and 40 had diagnoses of both alcohol and drug related problems. Clinical participants were mostly male, single, unemployed, and Catholic. Approximately 63% had completed a minimum of 8$^{th}$ grade level education. Patients' age ranged from 18 to 60 ($M$ = 37; $SD$ = 10).

***Non-Clinical Participants***

Non-clinical participants were contacted through two churches in Rio de Janeiro, Brazil – the Igreja Prebiteriana Betânia and the Igreja Congregacional de Vila Paraíso (see the Procedures section for details about how participants were recruited). They were fully informed about the purpose of the investigation, the procedures involved, the risks and benefits associated with their participation, and their right to withdraw from the study at any time. They were assured that their answers would be kept confidential and those who agreed to participate voluntarily were asked to sign an Informed Consent Form. The criteria for inclusion were: (1) subject's willingness to participate; (2) being above eighteen years of age; (3) receiving no treatment for substance abuse at the time of testing; and (4) having no history of substance abuse treatment. The decision to recruit non-clinical participants through churches was based on this investigator's relative easy access to this population through local contacts.

The non-clinical sample was composed of 33 female and 18 male participants ($N$=51), with ages ranging from 19 to 67 years ($M$ = 34; $SD$ = 13). Most non-clinical participants identified themselves as members of the protestant church, were either single or married, and had completed a minimum of 8$^{th}$ grade education. Approximately 50% had either college or graduate degrees. With regards to occupation, only 6% were unemployed. Table 9 presents a detailed description of the clinical and non-clinical samples, as well as of sub-samples within the clinical group (patients with alcohol-related problems only, patients with drug-related problems only, and patients receiving treatment for both alcohol- and drug-related problems).

**Table 9**
*Demographic Information*

| | Alcohol Only | Drug Only | Alcohol and Drug | Total Clinical Sample | Non-Clinical Sample |
|---|---|---|---|---|---|
| | N = 23 | N = 12 | N = 40 | N = 75 | N = 51 |
| **Age*** | | | | | |
| Mean and (SD) | 43 (8) | 32 (9) | 35 (9) | 37 (10) | 34 (13) |
| Range | 19 – 57 | 18 – 48 | 19 – 60 | 18 – 60 | 19 – 67 |
| **Gender*** | | | | | |
| Male | 19 | 9 | 31 | 59 | 18 |
| Female | 4 | 3 | 9 | 16 | 33 |
| **Marital Status**** | | | | | |
| Single | 11 | 6 | 19 | 36 | 26 |
| Married | 8 | 3 | 9 | 20 | 22 |
| Widowed | 1 | 0 | 1 | 2 | 0 |
| Separated/Divorced | 3 | 3 | 10 | 16 | 3 |
| **Occupation*** | | | | | |
| Office | 0 | 1 | 5 | 6 | 11 |
| Factory | 3 | 0 | 2 | 5 | 0 |
| Professional | 6 | 1 | 4 | 11 | 14 |
| Unemployed | 8 | 7 | 16 | 31 | 3 |
| Other | 6 | 3 | 13 | 22 | 23 |
| **Education*** | | | | | |
| Elementary Incomplete | 2 | 1 | 4 | 7 | 0 |
| Elementary Complete | 0 | 3 | 1 | 4 | 0 |
| Middle Incomplete | 5 | 3 | 9 | 17 | 1 |
| Middle Complete | 3 | 0 | 8 | 11 | 0 |
| High Incomplete | 5 | 1 | 3 | 9 | 2 |
| High Complete | 3 | 2 | 6 | 11 | 11 |
| College Incomplete | 4 | 1 | 4 | 9 | 12 |
| College Complete | 1 | 1 | 2 | 4 | 14 |
| Graduate Incomplete | 0 | 0 | 3 | 3 | 2 |
| Graduate Complete | 0 | 0 | 0 | 0 | 9 |
| **Religion*** | | | | | |
| None | 2 | 1 | 8 | 11 | 0 |
| Protestantism | 3 | 1 | 7 | 11 | 48 |
| Catholicism | 13 | 7 | 15 | 35 | 2 |
| Spiritism | 4 | 1 | 6 | 11 | 0 |
| Afro-Brazilian | 0 | 1 | 3 | 4 | 0 |
| Other | 1 | 1 | 1 | 3 | 1 |
| **Alcohol Treatment Hx*** | | | | | |
| Never | 11 | 8 | 19 | 38 | 51 |
| 1 – 2 times | 9 | 4 | 13 | 26 | 0 |
| 3 – 4 times | 2 | 0 | 1 | 3 | 0 |
| > 4 times | 1 | 0 | 7 | 8 | 0 |
| **Drug Treatment Hx***** | | | | | |
| Never | 20 | 7 | 16 | 43 | 51 |
| 1 – 2 times | 2 | 3 | 12 | 17 | 0 |
| 3 – 4 times | 0 | 1 | 4 | 5 | 0 |
| > 4 times | 0 | 0 | 7 | 7 | 0 |
| **Frequency of Drinking**** | | | | | |
| Never | 0 | 7 | 2 | 9 | 31 |
| 1 time per month or less | 0 | 0 | 1 | 1 | 12 |
| 2 – 4 times per month | 0 | 3 | 1 | 4 | 5 |
| 2 – 3 times per week | 4 | 1 | 6 | 11 | 3 |
| 4 or more times per week | 19 | 0 | 30 | 49 | 0 |

* $N = 126$; ** $N = 125$; *** $N = 123$

***Control Groups***

The composition of clinical and control groups varied for each hypothesis. For testing hypothesis 1, the clinical group was composed of participants who were receiving treatment for alcohol-related problems only ($N$ = 23) and those who were receiving treatment for both alcohol- and drug-related problems ($N$ = 40) at the time of testing. The control group was composed of non-clinical participants ($N$ = 51).

For hypothesis 2, the clinical group was composed of participants who were receiving treatment for drug-related problems only ($N$ = 12) and those who were receiving treatment for both alcohol- and drug-related problems ($N$ = 40) at the time of testing. The control group was composed of non-clinical participants ($N$ = 51).

For hypothesis 3, the clinical group was composed of participants who were identified as having either an alcohol abuse or an alcohol dependence diagnosis according to DSM-IV-TR criteria ($N$ = 66); the control group was composed of participants who did not meet DSM-IV-TR criteria for alcohol-related disorders ($N$ = 60).

For hypothesis 4, the clinical group was composed of participants who were identified as having either a drug abuse or a drug dependence diagnosis according to DSM-IV-TR criteria ($N$ = 72); the control group was composed of participants who did not meet DSM-IV-TR criteria for drug-related disorders ($N$ = 54).

***Statistical Differences Between Clinical and Control Groups***

Group equality was tested by performing chi-square tests on the following variables: gender, marital status, occupation, education, religion, alcohol treatment history, drug treatment history, and frequency of drinking. A t-test was used for testing equality in terms of age. The results indicated that the clinical and control groups (a) were

non-equivalent on all of these variables, except age, for hypothesis 1; (b) were non-equivalent on all variables, except age, for hypothesis 2; (c) were non-equivalent on all variables, except marital status, for hypothesis 3; and (d) were non-equivalent on all variables, except age, for hypothesis 4. Tables 10 through 13 present the results of these tests.

**Table 10**
*Tests of Group Equality on Demographic Variables for Hypothesis 1 (N = 114)*

| Variable | $t / x^2$ | *Df* | *P* |
|---|---|---|---|
| Age** | 1.91 | 110 | .059 |
| Gender | 22.74 | 1 | .000 |
| Marital Status* | 8.18 | 3 | .042 |
| Occupation | 23.63 | 4 | .000 |
| Education | 49.47 | 9 | .000 |
| Religion | 70.28 | 5 | .000 |
| Alcohol Treatment Hx | 37.60 | 3 | .000 |
| Drug Treatment Hx** | 26.91 | 3 | .000 |
| Frequency of Drinking | 89.96 | 4 | .000 |

* $N = 113$; ** $N = 112$

**Table 11**
*Tests of Group Equality on Demographic Variables for Hypothesis 2 (N = 103)*

| Variable | $t / x^2$ | *Df* | *P* |
|---|---|---|---|
| Age** | .16 | 99 | .874 |
| Gender | 18.14 | 1 | .000 |
| Marital Status* | 10.21 | 3 | .017 |
| Occupation | 24.37 | 4 | .000 |
| Education | 46.64 | 9 | .000 |
| Religion | 65.57 | 5 | .000 |
| Alcohol Treatment Hx | 37.59 | 3 | .000 |
| Drug Treatment Hx** | 44.22 | 3 | .000 |
| Frequency of Drinking* | 53.12 | 4 | .000 |

* $N = 102$; ** $N = 101$

**Table 12**
*Tests of Group Equality on Demographic Variables for Hypothesis 3 (N = 126)*

| Variable | $t / x^2$ | *Df* | *P* |
|---|---|---|---|
| Age** | 2.24 | 122 | .027 |
| Gender | 21.48 | 1 | .000 |
| Marital Status* | 4.77 | 3 | .190 |
| Occupation | 12.89 | 4 | .012 |
| Education | 33.16 | 9 | .000 |
| Religion | 57.71 | 5 | .000 |
| Alcohol Treatment Hx | 21.28 | 3 | .000 |
| Drug Treatment Hx*** | 14.40 | 3 | .002 |
| Frequency of Drinking* | 99.94 | 4 | .000 |

* $N = 125$; ** $N = 124$; ** $N = 123$

**Table 13**
*Tests of Group Equality on Demographic Variables for Hypothesis 4 (N = 126)*

| Variable | $t / x^2$ | *Df* | *P* |
|---|---|---|---|
| Age** | .80 | 122 | .423 |
| Gender | 11.05 | 1 | .001 |
| Marital Status* | 10.96 | 3 | .012 |
| Occupation | 11.73 | 4 | .019 |
| Education | 27.61 | 9 | .001 |
| Religion | 38.16 | 5 | .000 |
| Alcohol Treatment Hx | 20.29 | 3 | .000 |
| Drug Treatment Hx** | 40.57 | 3 | .000 |
| Frequency of Drinking* | 20.92 | 4 | .000 |

* $N = 125$; ** $N = 124$; ** $N = 123$

## *Data Collection Sites*

### *Clínica Pater-Aldeia*

The Pater-Aldeia Clinic is a privately owned substance abuse facility located in an upper-middle-class suburban area near the city of Rio de Janeiro. This clinic has been operating since 1990 and is staffed with a multidisciplinary clinical team that includes a

general physician, a psychiatrist, a counselor, a psychologist, an occupational therapist, and several nurses. The clinic provides residential treatment for up to 15 insured and private-pay patients with alcohol and/or drug problems. The minimum length of stay is 30 days, with some patients staying up to 45 days. Approximately 13% of the clinical data (10 subjects) were collected at this site.

***Primeira Clínica Popular do Estado do Rio de Janeiro***

The Primeira Clínica Popular do Estado do Rio de Janeiro – First Popular Clinic of the State of Rio de Janeiro - provides inpatient and outpatient substance abuse treatment free of charge to low-income patients in the suburban city of Santa Cruz. The clinic is a non-governmental agency funded by the state and has been operating since 2000. It is staffed with a multidisciplinary clinical team that includes several psychologists, physicians, occupational therapists, family therapists, social workers, nurses and health technicians. The clinic provides inpatient treatment for up to 90 patients with alcohol and/or drug problems. The typical length of stay is 40 to 45 days. After discharge, patients continue treatment on an outpatient basis for up to 9 months. Approximately 87% of the clinical data (65 subjects) were collected at this site. All participants were inpatients.

***Igreja Congregacional em Vila Paraíso***

With approximately 250 members, the Congregational Church of Vila Paraíso is a Protestant church located in a lower-middle-class suburban area near the city of Rio de Janeiro. Approximately 57% of the non-clinical data (29 participants) were collected at this site.

### *Igreja Presbiteriana Betânia*

Located in an upper-middle-class suburban area near the city of Rio de Janeiro, the Presbyterian Church Betânia is a Protestant church with approximately 400 members. Approximately 43% of the non-clinical data (22 participants) were collected at this site. Table 14 presents frequency and percentages of clinical and non-clinical participants by site.

**Table 14**
*Frequency and Percentages of Clinical and Non-Clinical Participants by Site*

| Sites | Frequency | % within Group | % Total |
|---|---|---|---|
| **Clinical** | | | |
| Pater-Aldeia Clinic | 10 | 13.3 | 7.9 |
| Popular Clinic of Rio de Janeiro | 65 | 86.7 | 51.6 |
| Clinical Total | 75 | 100.0 | 59.5 |
| **Non-Clinical** | | | |
| Congregational Church | 29 | 56.9 | 23.0 |
| Presbyterian Church | 22 | 43.1 | 17.5 |
| Non-Clinical Total | 51 | 100.0 | 40.5 |

## *Instrumentation*

### *BP- MCMI-III Alcohol Dependence and Drug Dependence Scales*

The Brazilian-Portuguese MCMI-III is a paper and pencil inventory containing 175 true-false items. Like the original MCMI-III, the BP-MCMI-III has a total of 27 subscales: (a) three for estimating the individual's test-taking attitude, (b) 14 for measuring different personality styles, and (c) 10 for assessing the presence of clinical syndromes, including anxiety, depression, psychotic disorders, posttraumatic stress, and substance-related problems (Millon, 1997).

The MCMI-III was translated by this investigator and other members of the research team using a combination of translation practices discussed in the literature, which included the use of a translation committee, the use of translation revisers, a backtranslation procedure, a bilingual test-retest pilot, and a final revision of the problem-items (Bracken & Barona, 1991; Geisinger, 1994; Butcher, 1996a; Butcher, 1996b; Butcher & Hans, 1996; Sperber, Devellis, & Boehlecke, 1994; Van de Vijver, F., & Hambleton, R. K., 1996). All 15 items that comprised the original Alcohol Dependence scale and all 14 items that comprised the original Drug Dependence scale remained in the translated version. No changes were made in the structure of the scales or in the content of the items. See Appendices E and F for more details on the scales' composition and item weighing for the original and translated versions.

High scores on the Alcohol Dependence scale are expected to be indicative of current problematic drinking or a history of alcoholism with associated symptoms such as subjective distress, family problems, and deficits in social and occupational functioning. Similarly, high scores on the Drug Dependence scale are expected to be indicative of current drug use or a history of drug addiction with associated symptoms (Craig, 1993). A reliability study with 220 Brazilian college students in Rio de Janeiro found test-retest coefficients of .70 and .85 for the BP-MCMI-III Alcohol Dependence and Drug Dependence scales, respectively (Magalhaes et al., 2004). Please refer to Appendices A and B for a detailed description of the methodological procedures used for the translation of the MCMI-III into Brazilian-Portuguese and the results of preliminary studies.

Due to the fact that the Portuguese language has gender-specific words, the development of gender-specific forms was deemed appropriate for use in the present study.

The BP-MCMI-III used in prior studies contained words in the masculine form only. The gender-specific forms that were used in this study were equal in content, but were expected to facilitate the readability of the items. The following are examples of items that were modified (gender-specific words are shown in bold).

*Item 18:*

a) *Tenho receio de me aproximar de outra pessoa porque posso acabar sendo* ***ridicularizado*** *ou* ***humilhado*** *(masculine form).*

b) *Tenho receio de me aproximar de outra pessoa porque posso acabar sendo* ***ridicularizada*** *ou* ***humilhada*** *(feminine form).*

*Item 90:*

c) *Às vezes fico* ***confuso*** *e me sinto* ***perturbado*** *quando as pessoas são gentis comigo (masculine form).*

d) *Às vezes fico* ***confusa*** *e me sinto* ***perturbada*** *quando as pessoas são gentis comigo (feminine form).*

***Diagnostic Questionnaire***

A diagnostic questionnaire was used to determine the presence or absence of substance abuse disorders according to the DSM-IV-TR criteria. This questionnaire is a self-report symptom checklist that contains 11 yes-no questions about substance use patterns, each corresponding to a specific diagnostic criterion listed under the DSM-IV-

TR diagnostic code. Separate forms for alcohol and drug abuse/dependence were available.

Structured diagnostic interviews are commonly used in substance abuse research and are generally considered reliable instruments for use with both clinical samples and the general population (Grant and Towle, 1990; Grant, 1997). The diagnostic instrument that was used in this study is a reduced version of the Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS), one of the most widely used diagnostic instruments of this type. The AUDADIS operationalized the DSM-IV criteria for alcohol abuse and dependence and relies exclusively on respondent self-report (Grant, 1992). A study with the AUDADIS found the combined diagnoses of lifetime alcohol abuse and dependence to be highly reliable (Grant, Harford, Dawson, Chou, and Pickering, 1995).

The translation of this instrument into Brazilian-Portuguese was completed by this investigator, with the assistance of a professional translator. The translated version was then backtranslated into English by a bilingual research assistant (Brazilian native) and compared with the original version by a monolingual English speaker (American native). No major discrepancies were found between the two English versions and only minimal changes were made on the final Brazilian-Portuguese version that was used in this study. Diagnoses made on the basis of this questionnaire were compared against diagnoses made on the basis of the BP-MCMI-III to test this study's primary hypotheses (3 and 4) and to calculate diagnostic efficiency indices for both substance dependence scales of the BP-MCMI-III. Appendices G and H present the English and Portuguese versions.

***Brazilian-Portuguese Version of the Alcohol Use Disorders Identification Test***

The Alcohol Use Disorders Identification Test (AUDIT) was developed by the World Health Organization (WHO) in a six-country collaborative project for early detection of problem drinking, as part of a brief intervention trial (Saunders & Aasland, 1987). The instrument has been recognized as a highly sensitive measure that has the advantage of detecting hazardous drinking separate from alcohol dependence, a feature that is considered an improvement over other screening questionnaires that were available at the time of its development. Unlike the MCMI-III Alcohol Dependence scale, which assesses drinking problems in the context of general psychopathology, the AUDIT was developed specifically for the detection of problem drinking in primary care settings, where hazardous drinkers seek medical treatment for other health-related concerns (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993; Miles, Winstock, & Strang, 2001; Maisto, S. A., Conigliaro, J., McNeil, M., Kraemer, K., & Kelley, M. E., 2000; Allen, Litten, Fertig, & Babor, 1997; Fleming, Barry, & MacDonald, 1991). Another important and unique feature of the AUDIT is the fact that its developers were careful to select items that were conceptually and empirically valid cross-culturally. Items were derived from a large cross-national data set ($N$ = 1888) and checks were made to ensure that none performed poorly in any individual national sample. Participating nations were Australia, Bulgaria, Kenya, Mexico, Norway and the United States (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993).

The AUDIT is a paper and pencil "yes-no" questionnaire composed of 10 items related to alcohol consumption patterns – three questions on the amount and frequency of drinking, three questions on harmful use of alcohol, and four on alcohol-related

consequences – and scores ranging from 0 to 40. Different cut-off scores have been suggested in the literature. The original 1987 study conducted by the WHO recommended a score of 11 or more as indicative of a drinking problem (Babor, T., Korner, P., & Wilber, C., 1987; cited in Fleming, Barry, & MacDonald, 1991), but other studies have used a cut-off score of 8 (Reinert & Allen, 2002; Conigrave, Hall, & Saunders, 1995; Maisto, S. A., Conigliaro, J., McNeil, M., Kraemer, K., & Kelley, M. E., 2000).

In a review of the AUDIT literature (English language version), Reinert and Allen (2002) reported that the instrument has proven to be internally consistent with diverse samples and in different settings, with median Chronbach's alpha falling in the .80s for the 18 studies included in the review. The four studies that tested the temporal reliability of the English AUDIT over a two-week interval found results ranging from .64 to .92. The median sensitivity was .86 and the median specificity was .89 for a cut-off score of 8, across 13 studies.

When researching for a Brazilian-Portuguese translation of the AUDIT to be used in this study, three were found. The first, by Figlie's research team, was used in a published study that looked at the frequency of smoking and problem drinking among general hospital inpatients in Sao Paulo, Brazil (Figlie, Pillon, Dunn & Laranjeira, 2000). In personal correspondence with the author (Figlie, 2004), Figlie reported that the reliability and validity of her translation was not tested, but graciously provided copy of an unpublished Masters thesis on a different translation of the AUDIT, developed by one of her colleagues (Méndez, 1999). Méndez developed a more systematic translation and tested its validity against diagnoses of alcohol abuse made on the basis of the ICD-10

criteria. His total sample was composed of 733 participants (486 had at least one drink in the past 12 months) recruited through two primary care facilities – a hospital and an outpatient clinic that serve low-income communities in the outskirts of Pelotas, southern Brazil. For a cut-off score of 8, sensitivity was .92 and specificity was .62. In order to improve specificity while keeping sensitivity within an acceptable level, Méndez suggested the use of a cut-off score of 10 (sensitivity = .88; specificity = .80). Table 15 shows validity indices for cut-off scores of 8, 10, 11, 12, 14 and 16.

**Table 15**
*Validity Indices of the Brazilian-Portuguese AUDIT for Diagnosing Alcohol Abuse*[a]

| | Cut-off Scores | | | | | |
|---|---|---|---|---|---|---|
| | 8 | 10 | 11 | 12 | 14 | 16 |
| Sensitivity | .92 | .88 | .84 | .84 | .74 | .65 |
| Specificity | .62 | .80 | .84 | .86 | .92 | .94 |
| Accuracy | .68 | .82 | .84 | .86 | .88 | .89 |
| Positive Predictive Power | .35 | .49 | .53 | .57 | .66 | .71 |
| Negative Predictive Power | .97 | .97 | .96 | .96 | .94 | .93 |
| Classification Error | .32 | .18 | .16 | .14 | .12 | .11 |

[a]Méndez (1999)

More recently, a revision of Méndez's translation was developed by Erikson Furtado's research team in São Paulo, Brazil, in collaboration with the WHO and researchers associated with the University of Connecticut. The Connecticut group is working under the leadership of Thomas Babor, one of the principal investigators involved in the development of the original AUDIT. In personal correspondence with Furtado (May 3, 2004), he reported that his new Portuguese version was developed with the objective of incorporating the most current changes made on the international version

of the AUDIT. His research group also produced a translation and adaptation of the AUDIT manual and the Brief Interventions manual released by the WHO in 2001 (Babor, Higgins-Biddle, Saunders & Monteiro, 2001; Babor & Higgins-Biddle, 2001).

When comparing the two versions, Furtado's differs from Méndez's in two ways: (1) less formal use of the Portuguese language; and (2) modifications in the number of standard-drinks for the question in item number 2 and the answer options in item number 3, to accommodate for differences in the amount of alcohol contained in typical Brazilian drinks (Furtado, 2004). Furtado reported that his team has not yet tested the reliability and validity of his revised Portuguese AUDIT but does not anticipate that he will find major differences from results obtained with Méndez's version. Although it is likely that the revised instrument remains valid, it is possible however that the changes made in the number of standard-drinks for items 2 and 3 will affect the operational characteristics of the instrument and, consequently, the selection of appropriate cut-off scores.

Despite the lack of new validity data to support the revised translation, five factors influenced this investigator's decision to use Furtado's version in this study: (1) it was developed in collaboration with the original developers of the test, (2) it is up-to-date with the most current AUDIT manual, (3) the wording of the questions is more casual and more appropriate for the location where the data will be collected, (4) items were adapted to account for differences in the amount of alcohol contained in typical Brazilian drinks, and (5) cut-off scores will not be needed for analysis (total scores will be used). See Appendix I for the AUDIT in English and Appendix J for the Portuguese version that was used in this study.

### *Demographic Questionnaire*

The demographic questionnaire gathered information about the subjects' age, gender, marital status, education, religion, occupation, history of substance abuse treatment, and reason for current admission to a substance abuse treatment facility. Information obtained with this questionnaire provided a description of the sample and determined group eligibility for hypotheses 1 and 2. See Appendix K.

## *Procedure*

### *Training of Research Assistants*

Because the principal investigator was residing in the United States when this study was carried out, one data collection coordinator and four research assistants were involved in the recruitment and administration of the assessment measures to participants in Brazil. The data collection coordinator was responsible for overseeing the implementation of the data collection procedures and ensuring consistency with the research protocol. The coordinator had a Masters degree in mental health counseling from Florida Atlantic University and was a licensed mental health counselor by the Florida Department of Health with over 10 years of clinical experience. She was provided with a copy of the research proposal, which included information about the purpose, theoretical basis and methods of the study, as well as specific instructions for instrument administration (see Appendix L).

The research assistants worked under the coordinator's supervision and were responsible for assisting her in all aspects of the data collection procedure. Three of them had graduate degrees (in education, marketing, and vocational counseling) and had experience with data collection prior to their collaboration with this study. One was

completing a college degree in economy.

The coordinator and assistants were trained by the principal investigator during a trip to Rio de Janeiro. The training consisted of two 2-hour meetings, during which the coordinator and assistants (a) were provided with a detailed explanation of the purpose of the study and all procedures involved in data collection, (b) were asked to complete all assessment measures to become familiar with the research protocol, and (c) were encouraged to ask questions and voice concerns about potential problems with the recruitment of subjects and the administration of the protocols. In addition, the coordinator and research assistants were supervised by the principal investigator during their first administration of the assessment materials. They maintained regular communication with the principal investigator by phone and e-mail during the entire data collection phase to discuss any problems with the recruitment of subjects and instrument administration.

Initially the research assistants were involved only in the recruitment and testing of controls, but later participated in data collection at the substance abuse treatment facilities as well, due to the coordinator being unable to continue her direct collaboration with this project.

## *Data Collection*

### *Clinical Sample*

Contact with program directors of the Clínica Pater-Aldeia and Primeira Clínica Popular do Estado do Rio de Janeiro was made by this investigator. A written authorization for data collection was obtained prior to the recruitment of the subjects and administration of the assessment measures.

During group therapy sessions, patients were made aware of this study by their own therapists, who asked for their voluntary and anonymous participation. All potential subjects were fully informed about the purpose of the investigation, the procedures involved, the risks and benefits associated with their participation, and their right to withdraw from the study at any time. They were assured that their answers would be kept confidential and those who agreed to participate were asked to sign an Informed Consent Form.

Patients who agreed to participate in the study stayed in the group room after their therapy session ended to complete the assessment materials. The instruments were administered by either the data collection coordinator or one of the research assistants. Even though data collection was performed outside of the United States, where the Health Insurance Portability and Accountability Act (HIPAA) does not apply, attention was paid to methods that insured patients' privacy.

***Non-Clinical Sample***

Contact with leaders of the Igreja Congregacional em Vila Paraíso and the Igreja Presbiteriana Betânia in Rio de Janeiro was made by this investigator. A written authorization for data collection was obtained.

During regular church meetings, a brief announcement about the study was made by the church leader and those interested in participating were instructed to meet with one of the research assistants for additional information. Those who decided to meet with the research assistants were fully informed about the purpose of the investigation, the procedures involved, the risks and benefits associated with their participation, and their right to withdraw from the study at any time. They were assured that their answers would

be kept confidential and those who agreed to participate were asked to sign an Informed Consent Form. Participants were then given the option to complete the assessment materials at that time or schedule an appointment to meet with the research assistants at another date.

***All Participants***

All participants, regardless of group membership, were administered the following assessment measures: (1) the Brazilian-Portuguese version of the third edition of the Millon Clinical Multiaxial Inventory (BP-MCMI-III), (2) the Brazilian-Portuguese version of the Alcohol Use Disorders Identification Test (AUDIT), (3) a diagnostic questionnaire (DSM-IV-TR), and (4) a demographic questionnaire.

Testing was typically done in groups of 5 to 10 participants and subjects were administered the assessment materials in counterbalanced order to control for possible order effects. Approximately half of the sample completed the assessment measures in the following order: demographic questionnaire, BP-MCMI-III, diagnostic questionnaire, and AUDIT. The other half completed the assessment measures in the following order: demographic questionnaire, diagnostic questionnaire, AUDIT, and BP-MCMI-III.

The examiners followed the standard administration procedures (Appendix L) with all subjects, except when participants did not have at least an 8$^{th}$ grade education ($N$ = 29). In those cases, examiners read the instructions and all questions to every one in the group and waited until all participants had answered each question before moving to the next. Standard administration involved reading the instructions and the first two questions of each instrument to ensure that participants understood how to complete the measures, and allowing them to complete the remaining questions at their own pace ($N$ = 97).

Participants who did not have at least an 8th grade education were mostly patients at the First Popular Clinic of the State of Rio de Janeiro (26 participants), 2 were patients at the Pater-Aldeia Clinic, and 1 was recruited through the Igreja Congregacional em Vila Paraiso.

For testing the effect of procedure differences on the subjects' test scores, 4 t-tests were run using a dummy-coded education variable (1 = 8th grade education and above; 0 = below 8th grade education) as the independent variable. The dependent variables were the subjects' raw and base rate scores on the Alcohol Dependence and Drug Dependence scales of the BP-MCMI-III. Because most participants who did not have a minimum of 8th grade education (97 percent of the total sample) were part of the clinical sample, only clinical subjects were used for this comparison. The results were not significant, indicating that procedure differences did not have an effect on the dependent variables. Table 16 presents the results of the t-tests.

**Table 16**
*Effect of Procedure Differences on the Dependent Variables*

| Variable | *t* | *Df* | *p* |
|---|---|---|---|
| Alcohol Dependence: Raw | .52 | 73 | .602 |
| Drug Dependence: Raw | 1.66 | 73 | .102 |
| Alcohol Dependence: Base Rate | .31 | 73 | .754 |
| Drug Dependence: Base Rate | 1.18 | 73 | .240 |

# CHAPTER IV

## Results

### *Preliminary Analyses*

#### *Effect of Test Order*

Robust t-tests were used to examine the effect of test order on the dependent variables. The results obtained were non-significant for both the Alcohol Dependence and the Drug Dependence scales, indicating that the order by which the tests were completed by the participants did not affect their BP-MCMI-III scores. Table 17 presents the results of these tests.

**Table 17**
*Effect of Test Order on the Dependent Variables (N = 126)*

| Variable | *t* | *df* | *p* |
|---|---|---|---|
| Alcohol Dependence: Raw | .46 | 123.94 | .644 |
| Drug Dependence: Raw | 1.12 | 122.78 | .265 |
| Alcohol Dependence: Base Rate | 1.11 | 121.75 | .270 |
| Drug Dependence: Base Rate | 1.03 | 123.77 | .305 |

#### *Correlation between the Dependent Variables*

Pearson correlations between the BP-MCMI-III Alcohol Dependence and Drug Dependence scales were calculated. For raw scores, the correlation was .85; and for base rate scores it was .73. They were both found to be significant at the .01 level (two-tailed).

#### *Effect of the Demographic Variables on the Dependent Variables*

As noted in the methods section, clinical and control groups were unequal on all demographic variables (except age for hypotheses 1, 2 and 4; and marital status for hypothesis 3). If the relationship between the demographic variables and the dependent

variables are statistically significant, this could pose a threat to the internal validity of the study.

Pearson correlations between the subjects' BP-MCMI-III scores on the Alcohol Dependence and Drug Dependence scales were run with the demographic variables to determine the need for statistically controlling their effect during hypotheses testing. Nominal variables were converted into dummy-coded variables to allow correlations to be computed [(1 = Protestant; 0 = other) for religion; (1 = married; 0 = other) for marital status; and (1 = employed; 0 = unemployed) for occupation]. Correlations were found to be significant for Gender, Marital Status, Education, Religion, History of Alcohol Treatment, History of Drug Treatment, and Frequency of Drinking. Table 18 presents the correlations for both raw and base rate BP-MCMI-III scores.

**Table 18**
*Correlations between the Subjects' Raw and Base Rate Scores on the BP-MCMI-III Substance Dependence Scales with Demographic Variables*

| Variable | Alcohol/Raw | Drug/Raw | Alcohol/BR | Drug/BR |
|---|---|---|---|---|
| Age | .04 | .09 | .05 | .16 |
| Gender | .35** | .40** | .32** | .26** |
| Marital Status | .17 | .23* | .18* | .28** |
| Occupation | .13 | .13 | .13 | .11 |
| Education | .55** | .55** | .52** | .47** |
| Religion | .67** | .67** | .63** | .61** |
| Alcohol Tx Hx | .45** | .45** | .38** | .39** |
| Drug Tx Hx | .39** | .47** | .34** | .41** |
| Frequency of Drinking | .71** | .60** | .65** | .57** |

*. Correlation is significant at the .05 level (2-tailed)
**. Correlation is significant at the .01 level (2-tailed)

### *Hypotheses Testing*

The analysis of covariance (ANCOVA) is a statistical test that can be used when there is need for elimination of systematic bias (Stevens, 1990), as is the case in this study. For testing hypotheses 1, 2, 3 and 4, eight analyses of covariance (ANCOVAs) were run using gender, education, history of alcohol treatment, history of drug treatment, frequency of drinking, and dummy coded variables for marital status (1 = married; 0 = other) and religion (1 = Protestant; 0 = other) as covariates. The independent variables for each analysis were dichotomous (two groups = clinical, control) and the dependent variables were the BP-MCMI-III raw and base rate scores for the Alcohol Dependence and Drug Dependence scales. Hypothesis 5 was tested by performing a t-test to determine the significance of the correlation between AUDIT scores and BP-MCMI-III scores.

#### *Hypothesis 1*

It was expected that clinical participants would have a significantly higher raw and base rate score than controls on the Alcohol Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III), when clinical and control groups were defined based on whether individuals were receiving or not receiving treatment for alcohol-related problems at the time of testing.

The diagnostic validity of the BP-MCMI-III Alcohol Dependence scale was supported by the results of the ANCOVAs when both raw ($F = 18.19$; $df = 1, 111$; $p < .05$) and base rate scores ($F = 7.79$; $df = 1, 111$; $p < .05$) were used in the analyzes. The scores of patients receiving treatment for alcohol-related problems at the time of testing ($N = 60$) were significantly higher than the scores of non-clinical participants ($N = 51$).

The magnitude of the effect (partial eta squared) reached .15 for raw and .07 for base rate scores.

***Hypothesis 2***

It was expected that clinical participants would have a significantly higher raw and base rate score than controls on the Drug Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III), when clinical and control groups were defined based on whether individuals were receiving or not receiving treatment for drug-related problems at the time of testing.

The diagnostic validity of the BP-MCMI-III Drug Dependence scale was also supported by the results of the ANCOVAs when both raw ($F = 70.38$; $df = 1, 99$; $p < .05$) and base rate scores ($F = 23.51$; $df = 1, 99$; $p < .05$) were used in the analyzes. The scores of patients receiving treatment for drug-related problems ($N = 48$) were significantly higher than the scores of non-clinical participants ($N = 51$). The magnitude of the effect (partial eta squared) reached .44 for raw and .21 for base rate scores.

***Hypothesis 3***

For hypothesis 3, groups were defined based on the presence of positive (clinical) versus negative (control) DSM-IV-TR diagnoses. Subjects who gave 3 or more "yes" responses for items 1 through 7 of the Diagnostic Questionnaire (alcohol use questions) met the DSM-IV-TR diagnostic criteria for alcohol dependence; those who gave 1 or more "yes" responses for items 8 through 11 met criteria for alcohol abuse (see Appendix J). It was expected that individuals diagnosed with alcohol abuse or dependence based on DSM-IV-TR criteria would have significantly higher raw and base rate scores than controls

on the Alcohol Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III).

The diagnostic validity of the BP-MCMI-III Alcohol Dependence scale was also supported by the results of the ANCOVAs when group eligibility was defined by the presence of positive versus negative DSM-IV-TR diagnoses, for both raw ($F = 10.24$; $df = 1, 121$; $p < .05$) and base rate scores ($F = 6.98$; $df = 1, 121$; $p < .05$). Participants who scored positive for alcohol-related problems on the Diagnostic Questionnaire (DQ) obtained higher raw and base rate scores on the BP-MCMI-III Alcohol Dependence scale than those who scored negative on the DQ. The magnitude of the effect (partial eta squared) reached .08 for raw and .06 for base rate scores.

***Hypothesis 4***

For hypothesis 4, groups were also defined based on the presence of positive (clinical) versus negative (control) DSM-IV-TR diagnoses. Subjects who gave 3 or more "yes" responses for items 1 through 7 of the Diagnostic Questionnaire (drug use questions) met the DSM-IV-TR diagnostic criteria for drug dependence; those who gave 1 or more "yes" responses for items 8 through 11 met criteria for drug abuse (see Appendix J). It was expected that individuals diagnosed with drug abuse or dependence based on DSM-IV-TR criteria would have a significantly higher raw and base rate score than controls on the Drug Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III).

The diagnostic validity of the BP-MCMI-III Drug Dependence scale was also supported by the results of the ANCOVAs when group eligibility was defined by the presence of positive versus negative DSM-IV-TR diagnoses, for both raw ($F = 61.83$; *df*

= 1, 121; $p < .05$) and base rate scores ($F = 22.99$; $df = 1, 121$; $p < .05$). Participants who scored positive for drug-related problems on the Diagnostic Questionnaire (DQ) obtained higher raw and base rate scores on the BP-MCMI-III Drug Dependence scale than those who scored negative on the DQ. The magnitude of the effect (partial eta squared) reached .36 for raw and .17 for base rate scores. Table 19 summarizes the results of the ANCOVAs for hypotheses 1 through 4.

**Table 19**
*Results of the ANCOVAs for Hypotheses 1 through 4*

| | *F* | | *p* | | $\eta^2$ | |
|---|---|---|---|---|---|---|
| | Raw Scores | Base Rates | Raw Scores | Base Rates | Raw Scores | Base Rates |
| Hypothesis 1 | 18.19 | 7.79 | .000 | .006 | .15 | .07 |
| Hypothesis 2 | 70.38 | 23.51 | .000 | .000 | .44 | .21 |
| Hypothesis 3 | 10.24 | 6.98 | .002 | .009 | .08 | .06 |
| Hypothesis 4 | 61.83 | 22.99 | .000 | .000 | .36 | .17 |

***Hypothesis 5***

It was expected that there would be a significant positive correlation between subjects' scores on the Alcohol Dependence scale of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III) and scores on the Alcohol Use Disorders Identification Test (AUDIT).

Pearson correlations between the AUDIT and the BP-MCMI-III Alcohol Dependence scale were obtained using both raw ($r = .81$) and base rate scores ($r = .72$). The results showed strong positive correlations that were significant at the .01 level. Findings indicate that these two scales are measuring similar constructs and support the construct validity of the BP-MCMI-III Alcohol Dependence scale.

## *Post Hoc Analyses*

### *Validity Indices of the BP-MCMI-III Alcohol and Drug Dependence Scales*

Diagnostic validity indices were computed for the BP-MCMI-III Alcohol Dependence and Drug Dependence scales at cut-offs of 75, 80 and 85. The presence of positive versus negative DSM-IV-TR diagnoses, determined by the subjects' scores on the Diagnostic Questionnaire, was considered the "gold standard" to which diagnoses made by the BP-MCMI-III were compared. Table 20 presents the number of positive and negative cases determined by the DSM-IV-TR criteria (true positives and true negatives) and the number of positive and negative cases identified by the BP-MCMI-III (test positives and test negatives).

**Table 20**
*Diagnoses made by the DSM-IV-TR Criteria and by the BP-MCMI-III*

| | DSM-IV-TR | | BP-MCMI-III (BR 75) | | BP-MCMI-III (BR 80) | | BP-MCMI-III (BR 85) | |
|---|---|---|---|---|---|---|---|---|
| | Positive | Negative | Positive | Negative | Positive | Negative | Positive | Negative |
| Alcohol | 66 | 60 | 73 | 53 | 59 | 67 | 51 | 75 |
| Drug | 54 | 72 | 53 | 73 | 46 | 80 | 39 | 87 |

Conceptual formulas used to calculate sensitivity, specificity, positive predictive power (PPP), negative predictive power (NPP), overall diagnostic power (DxP) and prevalence of the BP-MCMI-III substance dependence scales are presented on Table 21.

**Table 21**
*Conceptual Formulas for Calculating the Operating Characteristics of a Test*[a]

| Test Result | Disorder: Present | Disorder: Absent | |
|---|---|---|---|
| Positive | A | B | A + B |
| Negative | C | D | C + D |
| Totals | A + C | B + D | *N* |

| *Index* | *Definition*[b] | *Formula* |
|---|---|---|
| Sensitivity | Pr (Test + \| Disorder +) | A / (a + c) |
| Specificity | Pr (Test - \| Disorder - ) | D / (b + d) |
| Positive Predictive Power | Pr (Disorder + \| Test + ) | A / (a + b) |
| Negative Predictive Power | Pr (Disorder - \| Test - ) | D / (c + d) |
| Overall Diagnostic Power | Proportion correctly classified | (a + d) / N |
| Prevalence | Proportion of subjects with the disorder | (a + c) / N |

[a] In Gilbertini et al. (1986).
[b] Definitions are expressed in terms of conditional probabilities. The definitions for sensitivity would read: "the probability that the test is positive given the disorder is present."

Incremental validities for positive test diagnoses (IPPP) were defined as the difference between the Alcohol Dependence and Drug Dependence scales' positive predictive powers and the prevalence of alcohol and drug problems in the sample, respectively. Incremental validities for negative test diagnoses (NPPP) were defined as the difference between the Alcohol Dependence and Drug Dependence scales' negative predictive powers and their corresponding prevalence. Kappa values were determined by finding the proportion of agreements (adjusted for chance agreements) between BP-MCMI-III and DSM-IV-TR classifications. Additional validity indices that can be calculated independently from cut-off scores – Effect Size and the area under the ROC curve (AUC) – were also computed. The results are summarized on Table 22.

**Table 22**
*Diagnostic Validity Indices of the BP-MCMI-III Alcohol Dependence and Drug Dependence Scales at 75, 80 and 85 Cut-Offs*

| | Alcohol Dependence Scale | | | Drug Dependence Scale | | |
|---|---|---|---|---|---|---|
| | BR 75 | BR 80 | BR 85 | BR 75 | BR 80 | BR 85 |
| Sensitivity | .94 | .80 | .71 | .82 | .72 | .65 |
| Specificity | .82 | .90 | .93 | .88 | .90 | .96 |
| PPP | .85 | .90 | .92 | .83 | .85 | .90 |
| NPP | .93 | .81 | .75 | .86 | .81 | .78 |
| DxP | .88 | .85 | .82 | .85 | .83 | .82 |
| IPPP | .33 | .38 | .40 | .40 | .42 | .47 |
| INPP | .41 | .29 | .23 | .43 | .38 | .35 |
| Kappa | .76 | .70 | .64 | .69 | .64 | .62 |
| Prevalence | .52 | .52 | .52 | .43 | .43 | .43 |
| Effect Size | 1.89 | 1.89 | 1.89 | 1.90 | 1.90 | 1.90 |
| AUC | .94 | .94 | .94 | .94 | .94 | .94 |

The area under ROC (receiver operating characteristic) curves, also known as AUC, was determined by plotting true positive rates against false positive rates of alcohol and drug problems at different cutoff points. Figure 1 and 2 provide a visual representation of AUC for both the Alcohol Dependence and Drug Dependence scales.

Figure 1: AUC for the Alcohol Dependence Scale of the BP-MCMI-III

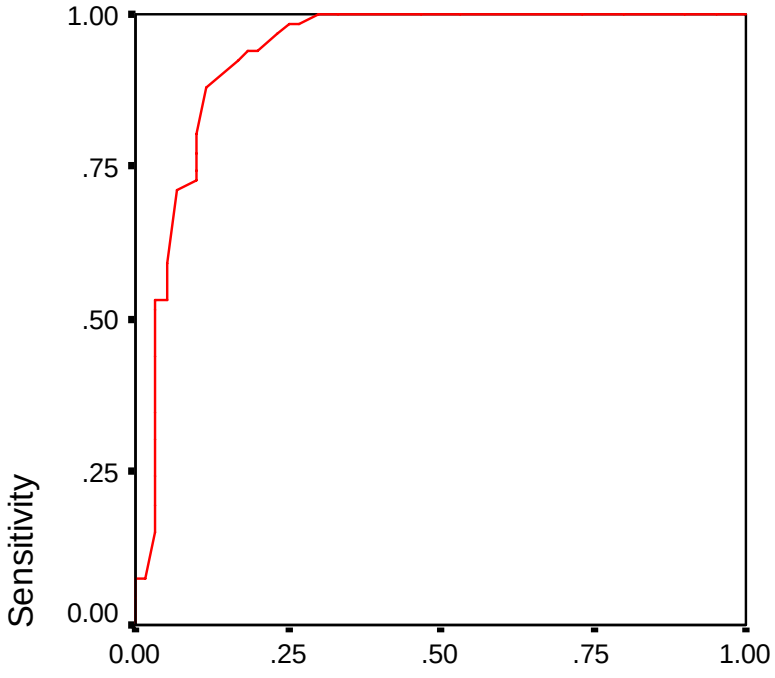
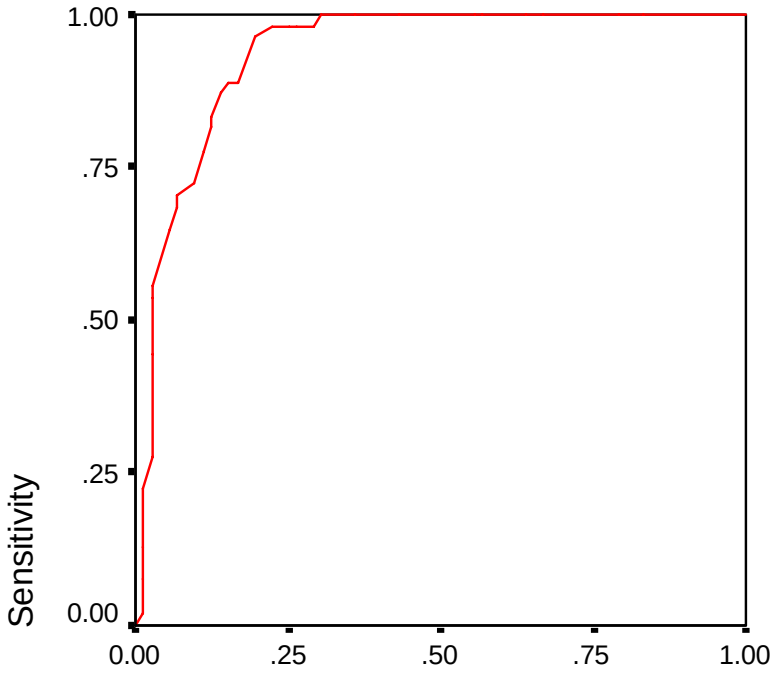


Figure 2: AUC for the Drug Dependence Scale of the BP-MCMI-III



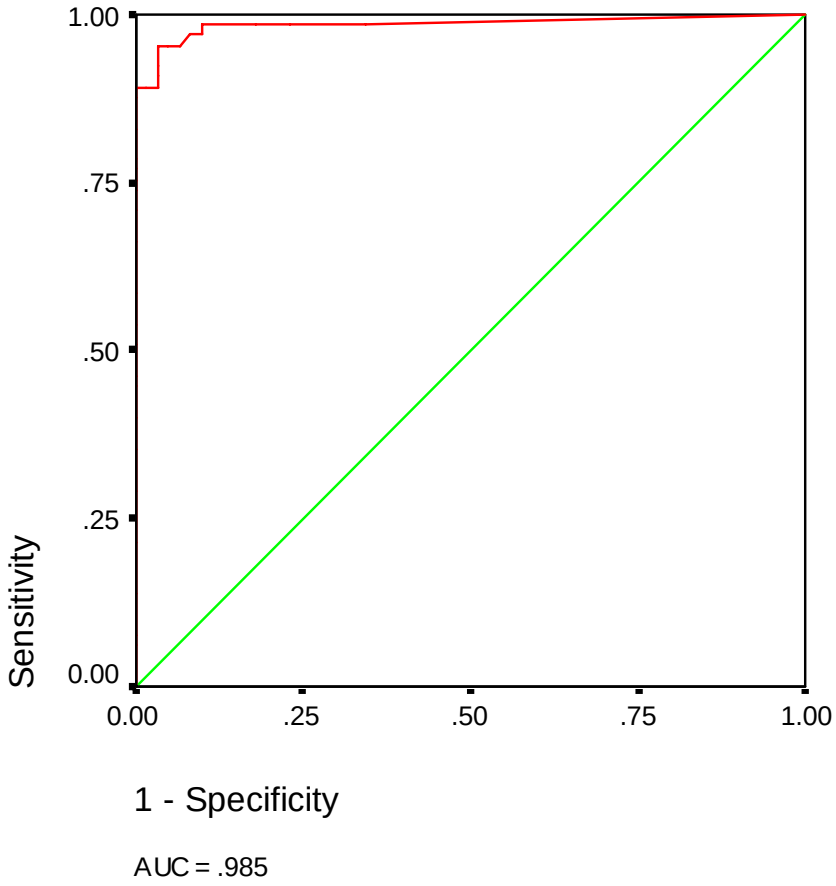
***Validity Indices of the Brazilian AUDIT***

The operating characteristics of the revised translation of the AUDIT used in this study were not previously reported in the literature. Validity indices were calculated with this sample (N = 126). The results are presented on Table 23.

**Table 23**
*Operating Characteristics of the Revised Brazilian AUDIT at 7, 8, 9 and 10 Cut-Offs*

| | AUDIT Cut-Scores | | | |
|---|---|---|---|---|
| | 7 | 8 | 9 | 10 |
| Sensitivity | .95 | .95 | .95 | .92 |
| Specificity | .93 | .95 | .97 | .97 |
| PPP | .94 | .95 | .97 | .97 |
| NPP | .95 | .95 | .95 | .92 |
| DxP | .94 | .95 | .96 | .94 |
| IPPP | .42 | .44 | .45 | .45 |
| INPP | .43 | .44 | .44 | .41 |
| Kappa | .89 | .91 | .92 | .89 |
| Prevalence | .52 | .52 | .52 | .52 |

Figure 3: AUC for the Revised Brazilian AUDIT



# CHAPTER V

## Discussion

### *Hypotheses*

This study examined the validity of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (BP-MCMI-III) Alcohol Dependence and Drug Dependence scales for detecting alcohol- and drug-related problems in a Brazilian sample composed of clinical and non-clinical subjects.

It was hypothesized that clinical participants would obtain significantly higher raw and base rate scores than controls on the Alcohol Dependence scale of the BP-MCMI-III when groups were defined based on two criteria: (a) whether individuals were receiving or not receiving treatment for alcohol-related problems at the time of testing (Hypothesis 1), and (b) whether they met the DSMI-IV-TR criteria for either alcohol abuse or dependence (Hypothesis 3).

It was also hypothesized that clinical participants would obtain significantly higher raw and base rate scores than controls on the Drug Dependence scale of the BP-MCMI-III when groups were defined based on: (a) whether individuals were receiving or not receiving treatment for drug-related problems at the time of testing (Hypothesis 2), and (b) whether they met the DSM-IV-TR criteria for either drug abuse or dependence (Hypothesis 4).

Furthermore, it was expected that there would be a significant positive correlation between participants' scores on the Alcohol Dependence scale of the BP-MCMI-III and scores on the Alcohol Use Disorders Identification Test (AUDIT) (Hypothesis 5).

All hypotheses were supported by the data. Findings indicated that the BP-MCMI-III Alcohol Dependence scale can identify Brazilians with alcohol-related

disorders among those who do not have problems related to alcohol consumption; and that the BP-MCMI-III Drug Dependence scale can identify Brazilians with drug-related disorders among those who do not have problems related to drug usage. Furthermore, a high correlation between the BP-MCMI-III alcohol dependence scale and the AUDIT was found, which provides additional support for the validity of this scale.

### *Diagnostic Validity Indices*

Base Rate scores for the MCMI-III are anchored to the prevalence rate of disorders in the psychiatric population. Prevalence rates obtained with the clinical sample used in the development phase of the instrument, as well as information derived from various epidemiological studies in the United States, were used to develop the criteria utilized to create the base rate scores for the original MCMI-III. As they apply to the clinical syndrome scales, cut-off scores of 75 and above on the MCMI-III indicate the presence of a syndrome; while scores of 85 and above indicate the prominence of a syndrome.

The sample used in the present study was homogeneous when compared to the hundreds of participants with various psychiatric disorders that were included in the sample utilized for the development of the MCMI-III. Given the fact that prevalence was .52 for alcohol-related problems and .43 for drug related-problems in the present sample, these indices are likely to be non-representative of the prevalence of substance abuse disorders in the Brazilian psychiatric population at large and, therefore, inappropriate for deriving new base rate scores for the BP-MCMI-III.

Without computing new base rates for the BP-MCMI-III, we can say that a 75 cut-off for these scales is perhaps the most effective cut-score given this sample. At the

cut-score of 75, the BP-MCMI-III alcohol and drug dependence scales performed approximately equal or better than the MCMI-III (at cut-score of 85) for most validity indices when the 1994 MCMI-III data set was used for comparison. The BP-MCMI-III alcohol and drug dependence scales performed approximately equal or somewhat worse than the MCMI-III (at cut-score of 85) for most validity indices when the 1997 MCMI-III data set was used for comparison. These results are not surprising given the fact that there is concern about the possibility of underestimation of the validity of the MCMI-III based on the 1994 validity data and the potential for overestimation based on the 1997 data set (Hsu, 2002). A more detailed discussion about the 1994 and 1997 MCMI-III validity studies of the MCMI-III can be found in the literature review section of this paper. Table 24 and 25 present validity indices for the MCMI-III and the BP-MCMI-III at 75 and 85 cut-offs.

**Table 24**
*Comparative Table of Validity Indices for the MCMI-III and BP-MCMI-III Alcohol Dependence Scales*

| | MCMI-III | | BP-MCMI-III | |
|---|---|---|---|---|
| | 1994[a] | 1997[a] | BR 75 | BR 85 |
| Sensitivity | .73** | .80* | .94 | .71 |
| Specificity | .86** | | .82 | .93 |
| PPP | .42** | .88* | .85 | .92 |
| NPP | .96** | | .93 | .75 |
| DxP | | | .88 | .82 |
| IPPP | .30*** | .71*** | .33 | .40 |
| INPP | .08*** | .13*** | .41 | .23 |
| Kappa | .45*** | .81*** | .76 | .64 |
| Prevalence | .12** | .17* | .52 | .52 |
| Effect Size | 1.68*** | 2.85*** | 1.89 | 1.89 |
| AUC | .88*** | .98*** | .94 | .94 |

[a]Statistic calculated using cut-score of 85.
*In Millon, 1997; **In Restlaff, 1996; and ***In Hsu, 2002.

**Table 25**
*Comparative Table of Validity Indices for the MCMI-III and BP-MCMI-III Drug Dependence Scales*

| | MCMI-III | | BP-MCMI-III | |
|---|---|---|---|---|
| | 1994 [a] | 1997 [a] | BR 75 | BR 85 |
| Sensitivity | .52** | .82* | .82 | .65 |
| Specificity | .95** | | .88 | .95 |
| PPP | .47** | .93* | .83 | .90 |
| NPP | .96** | | .87 | .78 |
| DxP | | | .85 | .82 |
| IPPP | .39*** | .82*** | .41 | .47 |
| INPP | .04*** | .09*** | .44 | .36 |
| Kappa | .47*** | .86*** | .69 | .62 |
| Prevalence | .08** | .11* | .43 | .43 |
| Effect Size | 1.67*** | 3.34*** | 1.90 | 1.90 |
| AUC | .88*** | .99*** | .94 | .94 |

[a]Statistic calculated using cut-score of 85.
*In Millon, 1997; **In Restlaff, 1996; and ***In Hsu, 2002.

***Sensitivity and Specificity***

Specificity values for the alcohol dependence and drug dependence scales were above .80. Sensitivity was above .90 for alcohol dependence and above .80 for drug dependence. This indicates that both scales were sensitive for detecting positive disordered cases in the sample, while being specific enough to identify as positive those cases that truly had substance abuse disorders. As noted in the literature review section, specificity and sensitivity are usually considered to be independent of the prevalence of the disorder in the sample; in other words, a test should identify the same proportion of disordered cases across samples. However, calculating these two indices requires that one knows which cases in the sample really have the disorder the instrument is supposed to detect.

In the present study, true positive and true negative cases of alcohol- and drug-related disorders were determined by the subjects' scores on a self-report symptom checklist, which contained 11 yes-no questions about substance use patterns, each corresponding to a specific diagnostic criterion listed under the DSM-IV-TR diagnostic code. Separate forms for alcohol and drug abuse/dependence were used.

This leads to a question regarding the reliability and validity of the DSM-IV-TR and of diagnostic criteria checklists for accurately diagnosing substance abuse disorders. Because there is much overlap between the so-called "mental disorders," critics of the DSM argue that categorical systems are ineffective and can work optimally only when members of a diagnostic class are homogeneous, when there are clear boundaries between classes, and when different classes are mutually exclusive (APA, 1994).

Despite its limitations, the DSM classification system has been recognized as a major improvement over diagnostic methods that rely on a clinician's subjective interpretation of presented symptoms. A major contribution of the DSM is the development of specific criteria for classification of disorders, which allowed for the development of structured diagnostic interviews and increased the reliability of diagnoses made across examiners (Spiegel, 2005).

Structured diagnostic interviews are commonly used in substance abuse research and are generally considered reliable instruments for use with both clinical samples and the general population (Grant and Towle, 1990; Grant, 1997). The self-report measure that was used in this study is a reduced version of the Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS), one of the most widely used diagnostic instruments of this type.

***Predictive Power and Overall Diagnostic Power Indices***

Predictive power indices (PPP and NPP) represent the probability that a disorder is present or absent given the results of the test. Compared to specificity and sensitivity, PPP is usually considered more useful to the clinician making decisions about individual patients (Gibertini et al, 1986; Retzlaff, 1996).

At a 75 cut-off, the BP-MCMI-III substance dependence scales' positive predictive powers (PPPs) were higher (.85 for alcohol and .83 for drug dependence) than those reported for the MCMI-III 1994 data set (.42 and .47) and somewhat lower than those reported for the 1997 data set (.88 and .93). Negative predictive power (NPP) was .93 for alcohol dependence and .87 for drug dependence for the BP-MCMI-III; and .96 for both MCMI-III substance dependence scales with the 1994 sample. At an 85 cut-off

the BP-MCMI-III gains more positive predictive power for both scales, but negative predictive powers drop below .80.

Overall Diagnostic Power (DxP) provides a global index of a test's overall classification accuracy. Generally speaking, this index is a combination of the two predictive power indices (PPP and NPP) and reflects the proportion of correctly classified subjects according to the presence or absence of a disorder. The BP-MCMI-III overall diagnostic power was above .80 for both substance dependence scales at the 75 and 85 cut-offs. DxP for the original MCMI-III was not reported in the literature.

***Chance-Adjusted Indices***

Hsu (2002) argued that predictive power indices (PPP and NPP) can be misleading, despite the great importance they have been assigned in the literature. A major limitation of PPP and NPP is that, in the absence of any association between test scores and the presence or absence of the disorder, they can be expected to be equal to the prevalence of the disorder in the sample. In other words, it is only when a test shows predictive power indices that exceed prevalence, that one can say that diagnoses made based on the test are better than chance.

Hsu (2002) demonstrated that Incremental Validity of Positive Test Diagnoses (IPPP) and Incremental Validity of Negative Test Diagnoses (INPP) can prevent misinterpretation of PPP and NPP, by proving information about how much better than chance a test correctly identifies positive and negative cases of a disorder.

IPPPs obtained with the present sample for the BP-MCMI-III substance dependence scales were similar to those reported for the MCMI-III 1994 data set at a 75 cut-off (.33 for the alcohol dependence and .41 for drug dependence) and somewhat

higher at an 85 cut-off (.40 and .47, respectively). On the other hand, compared to the IPPPs obtained with the MCMI-III 1997 data set (.71 and .82 for alcohol and drug dependence respectively), the IPPPs for the BP-MCMI-III substance dependence scales were much lower.

INPPs obtained for the BP-MCMI-III at a 75 cut-off were .41 for alcohol dependence and .44 for drug dependence. They were somewhat lower at an 85 cut-off (.23 and .36 for alcohol and drug dependence, respectively), but still much higher than the same indices reported for both the 1994 (.08 for alcohol dependence and.04 for drug dependence) and 1997 (.13 for alcohol dependence and .09 for drug dependence) MCMI-III samples.

Unlike IPPP and INPP, which provide separate chance-adjusted measures of either positive or negative test diagnoses, Cohen's Kappa can be used to measure the combined chance-adjusted diagnostic validities of both positive and negative test diagnoses (Hsu, 2002). Kappa values obtained with the present sample for the BP-MCMI-III substance dependence scales at a 75 cut-off are .76 and .69, which are higher than Kappas obtained with the 1994 MCMI-III data set (.45 for alcohol dependence and .47 for drug dependence) and lower than Kappas obtained with the 1997 MCMI-III sample (.81 for alcohol dependence and .86 for drug dependence). At an 85 cut-off, Kappa values are somewhat lower for the BP-MCMI-III alcohol and drug dependence scales (.64 and .62, respectively).

***Cohen's Effect Size and AUC***

A limitation of the use of PPP, NPP, IPPP, INPP, and Kappa as diagnostic validity indices is that these statistics are dependent on base rates. Cohen's effect size, on

the other hand, is free from the effects of cut scores and prevalence, and can be used as a measure of the relative ability of a test to discriminate between groups (Hsu, 2002). Cohen's effect size was 1.89 for the BP-MCMI-III alcohol dependence scale and 1.90 for the drug dependence scale, which are considered large (Cohen, 1988).

The area under receiver operating characteristics curves (AUC) can also be used as a validity index that is free from the effects of cut scores and prevalence. According to Hsu (2002), this index "reflects the probability that a randomly selected person from one population will have a scale score that exceeds that of a randomly selected person from the other population." AUC for the BP-MCMI-III substance dependence scales were both .94, slightly larger than the reported AUCs for the 1994 MCMI-III study and slightly smaller than the AUCs for the 1997 study.

***Concluding Remarks***

Diagnostic validity indices obtained with the present sample provided additional support for the validity of the BP-MCMI-III substance dependence scales for detecting alcohol- and drug-related disorders among Brazilians. Generally speaking, the diagnostic efficiency values obtained with this sample were approximately equal or better than those reported for the MCMI-III when the 1994 MCMI-III data was used for comparison; values were approximately equal or somewhat worse than those reported for the MCMI-III when compared to the 1997 data set. The BP-MCMI-III diagnostic efficiency values obtained with the present study were consistent with the results of previous validity studies with the MCMI-III. Present findings suggest that the BP-MCMI-III can be a useful diagnostic tool.

### *Internal and External Validity of the Study*

Potential threats to internal validity (associated with group differences in terms of gender, marital status, education, religion, history of alcohol treatment, history of drug treatment and frequency of drinking) were addressed with the use of ANCOVAs during hypotheses testing. Although ANCOVAs can not completely remove the potential for selection bias with intact groups, this method is considered to be a reasonable solution for the problem of unequal groups if caution is exercised when interpreting the results (Stevens, 1990). Given the limitations of ANCOVAs for controlling the potential for selection bias in non-randomized studies, the conclusions about this study are presented tentatively.

The fact that the sample was composed of Brazilians residing in Brazil is one of the strengths of this study. If data had been collected in the United States, the participants' understanding of individual test items potentially would have been affected by acculturation, which in turn would have limited the external validity of the results.

Nevertheless, the results of this study must be interpreted in the context of the characteristics of the sample it used. Participants were recruited from low-income and middle-income suburban areas in Rio de Janeiro, the second largest metropolitan region in Brazil. Although it is unlikely that Brazilians residing in other parts of Brazil would have responded differently to the assessment measures, it is possible that regional differences in the use of the Portuguese language may have affected the results.

### *Future Directions*

Findings supported the validity of the BP-MCMI-III substance dependence scales for detecting substance-related problems among Brazilians. Future studies should focus on examining the diagnostic efficiency of the scales with a sample that includes a more heterogeneous psychiatric population, so that new base rates can be computed. The validity of other BP-MCMI-III scales should also be examined so that the instrument's overall diagnostic utility can be ascertained.

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# APPENDIX A

## Unpublished Manuscript

The translation of the MCMI-III into Brazilian-Portuguese: Preliminary findings. Paper presented at the Interamerican Congress of Psychology in Caracas, Venezuela. (Magalhaes, C.; Magalhaes, E.; Sellers, A; Lewis, J., 1999)

**PAPER PRESENTED AT THE XXVII INTERAMERICAN CONGRESS OF PSYCHOLOGY, CARACAS, VENEZUELA, JULY , 1999.**

# The Translation of the MCMI-III into Brazilian-Portuguese: Preliminary Findings

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A Brazilian-Portuguese version of the MCMI-III was developed to be used in future studies that will examine cross-cultural aspects of personality and psychopathology in Brazil and the United States. This paper presents the translation methodology for this endeavor and the preliminary statistical results. The linguistic equivalency of the two versions was evaluated with a group of bilingual individuals in the United States. Item-by-item agreement rates ranged from 44% to 100% (Median=90.4%). The median correlation between English and Brazilian-Portuguese versions across the 27 scales was .83 (range = .07 to .96). These results are seen as encouraging and suggest consistency of measurement across cultures.

The Millon Clinical Multiaxial Inventory (MCMI) is currently one of the most popular instruments used for the assessment of adult psychopathology in the United States (Choca & Van Denburg, 1997). It has inspired a growing number of studies since its first publication in 1977 and now, in its third version, occupies a central place in many clinical settings (Craig, 1997). Several translations and adaptations of the Millon Inventories to other languages have been reported in the literature and are currently being used in many other countries (e.g. Sloore & Derksen, 1997; Mortensen & Simonsen, 1990; Luteijn, 1990).

According to Escovar (1997), the MCMI is particularly appropriate for cross-cultural applications. Because of its solid theoretical foundation, the MCMI allows for the assessment of personality disorders and clinical syndromes at a basic, theoretical level. Moreover, the MCMI's consonance with the DSM-IV allows for the interpretation and reporting of results according to the current psychiatric nosology used in many countries (Millon & Millon, 1997).

Due to the demand for psychological instruments that can be appropriately used with Portuguese speaking individuals of Brazilian heritage, we conducted a translation of the MCMI-III into Brazilian-Portuguese. Only a small number of instruments are now available for clinical and research purposes with a Brazilian population and a good part of these instruments are based on projective diagnostic approaches. There is a need for self-report measures in Brazilian-Portuguese that are reliable, easy to use in a variety of clinical settings, and up-to-date with the most current theories of personality and psychopathology.

The current literature provides several guidelines for the translation and adaptation of psychological instruments for cross-cultural use (see Van de Vijver & Hambleton, 1996, for a comprehensive description of potential sources of bias and recommended practices). The

translation/back translation procedure is considered standard by most test translators and is used to evaluate whether original item content is preserved or changed in the translated version. In this procedure, the translated items are translated back into the source language and then compared with the original version of the instrument to check for content discrepancies. Although this method seems to be a common procedure among test translators (e.g. Sloore & Derksen 1997; Saito, Nomura, Noguchi & Tezuka, 1996), the literature advises that it should be used with caution. According to Geisinger (1994), research has found that test translators, when knowing that their work will be subject to back translation, tend to use wording that ensures a good match between back translation and original version, rather than one that accurately reproduces the original content of the items. Moreover, readability and fluency of the text tend to be neglected when back translation procedures are employed (Van de Vijver & Hambleton, 1996). Other authorities in the field have concluded, however, that back translation is a valuable tool despite its limitations and should be implemented by test translators (Butcher, 1996).

As an alternative technique to back translation, the use of revisers has been suggested by Geisinger (1994). He recommended having a group of individuals carefully review all translated items, make comments about the quality of the translation, and discuss with test translators alternative wording for problem-items. This review process is also expected to minimize the potential for translation bias as well as to enhance the quality of the final product.

Another recommended practice is the use of a committee approach to translation (Butcher, 1998; Sloore & Derksen 1997; Saito et al, 1996; Butcher, 1996). Rather than having only one person translate the instrument, the literature suggests having members of a translation team make the translation of all items independently and later integrate their work into one version on the basis of discussion. The committee members should be not only fluent in both languages but also knowledgeable about both cultures and the constructs being measured (Geisinger, 1994).

Finally, in order to further evaluate the linguistic accuracy of a translated instrument, a pilot study using bilingual individuals should be carried out (Butcher, 1998; Sloore & Derksen, 1997; Butcher, 1996; Saito et al., 1996). In this method, both versions are administered to a sample of bilingual subjects to detect problems with particular items and evaluate the reliability of the instrument across versions. Frequent discrepancies between same items are expected to indicate possible translation problems and would suggest the need for further refinement of the translated item. The correlation coefficients obtained are expected to approximate the test-retest reliability coefficients reported in the literature for the original version of the instrument.

The purpose of the present paper is to describe the methodology used for the translation of the MCMI-III into Brazilian-Portuguese and to present the bilingual pilot results. As noted above, correlations are expected to approximate the test-retest reliability of the MCMI-III. Further studies will be required to evaluate the psychometric properties of the new instrument (Paunonen & Ashton, 1998) and its validity for use with a Brazilian population. Validity-threatening factors related to the construct being measured (construct bias) and to instrument administration (method bias) should also be examined in the future to ensure appropriate clinical and research use (Van de Vijver & Hambleton, 1996).

## Method

### *Translation Procedures*

Our research team reviewed the translation practices recommended in the literature (Butcher, 1998; Butcher, 1996; Van de Vijver & Hambleton, 1996; Geisinger, 1994) and considered the expertise of others who have translated tests (e.g., Sloore & Derksen, 1997; Saito et al,

1996) before initiating the translation of the MCMI-III into Brazilian- Portuguese. A combination of the practices discussed in the introduction was deemed appropriate for our study.

### *Initial Translation and Revision*

A committee approach was used in which the initial translation was conducted independently by each member of the committee and then integrated on the basis of discussion. This committee consisted of two bilingual Brazilians with cross-cultural experience (two of the authors). Both had more than 10 years of clinical experience and were familiar with the content of the MCMI-III.

The initial translation was then revised by two research assistants who were selected to participate in this project due to their extensive experience in both cultures and their knowledge of English and Brazilian-Portuguese grammar. One reviser was an American who had spent more than 15 years working in Brazil and fully comprehended the nuances of both languages. The second reviser was a Brazilian who had been studying and working in the United States for 8 years (she currently works as a mental health counselor and professional translator in Broward County, Florida, USA). Because the revisers were not familiar with the content of the MCMI-III, their suggestions were analyzed by the translation committee who made the necessary adjustments to the items before submitting them to the back translation procedure.

When working on the items independently, the translation committee and the revisers were instructed to keep several principles in mind: (1) if possible, maintain the original wording and sentence construction; (2) if necessary, modify the wording and/or sentence construction making changes as minimal as possible; (3) try to use words and sentences that are easy to understand; (4) if there is more than one way an item can be translated, choose the most simple one; (5) if necessary, use explanatory words/sentences within parenthesis to clarify words that have ambiguous meaning.

### *Back Translation*

Back translation was conducted by another Brazilian research assistant with extensive experience in both cultures (more than 20 years working in the United States). The back translated items were latter compared to the original items by an American research assistant who had no knowledge of Portuguese. When discrepancies were found between back translated items and their correspondent items in the original version, the translation committee and the back translator worked together to detect the reason for the problems, generate alternative formulations, and prepare the final version used in the bilingual retest study.

### *Bilingual Retest Strategy*

#### *Participants*

Potential subjects were recruited from the community on the basis of their availability. They were contacted informally through schools, churches, and businesses that serve the Brazilian community in Dade and Broward Counties (Florida, USA). They were informally approached by the investigators and invited to participate in the study by responding anonymously to the assessment materials. At this time they received a brief explanation of the purpose of the study and were assured of their anonymity. Those who volunteered were scheduled for a first interview with one of the researchers.

During this first interview all volunteers were fully informed about risks and benefits associated with their participation, their right to withdraw from the study at any time, and the procedures involved, including those related to ensuring their anonymity. Those who agreed to participate were asked to sign an Informed Consent Form. All subjects were treated in accordance with the ethical guidelines of the American Psychological Association.

Criteria for inclusion in this study were: (1) subject's willingness to participate; (2)

above 18 years of age; (3) above 8 years of education; and (4) ability to speak and read English and Brazilian-Portuguese. Subjects were excluded from the study if they scored below the 8th Grade level on the reading subtest of the Wide Range Achievement Test - 3rd Ed. (WRAT-III; Wilkinson, 1993).

A total number of twenty-one Brazilian individuals fluent in Brazilian-Portuguese and English volunteered for this study. From this group, four volunteers failed to appear for the second interview, two did not meet criteria for inclusion in the study, and six were not able to complete retest in time to be included in this report. The remaining participants were 5 males and 4 females with ages ranging from 34 to 58 (Mean = 41.7) and years of education ranging from 10 to 22 (Mean = 12.7).

### *Instrumentation*

***Millon Clinical Multiaxial Inventory - III.*** The MCMI-III (Millon, 1994) is a 175-item instrument composed of 11 clinical personality scales, 3 severe personality pathology scales, 7 clinical syndrome scales, 3 severe syndrome scales, and 4 modifying indices scales. Due to the norming of the MCMI-III on psychiatric patients, base rates (BR) are employed rather than standard scores. A BR score of $\geq$ 75 on a given scale indicates that feature is present in the individual's personality, while a BR score of $\geq$ 85 indicates that feature is prominent in the composition of their personality. Strengths of the MCMI-III include its norming on a psychiatric population, its brevity, and its ease of administration. Moreover, the Millon inventories appeal to many professionals as they define personality traits using nomenclature with which clinicians are accustomed (Choca & Van Denburg, 1997; McCabe, 1984). According to Millon (1994), internal consistency (alpha) coefficients exceed .80 for 20 of the 26 scales. Also, the median stability coefficient, based on two test administrations between five and 14 days apart, was .91. Regarding validity, Millon reported that correlations between scale BR scores and collateral instruments (e.g., BDI, MMPI-2, SCL-90-R) were generally favorable.

***Wide Range Achievement Test - III.*** The WRAT-III has one level for ages 5-75. There are three forms (blue, tan, and combined). The total number of possible points for each of the alternate forms (blue, tan) is 57, and 99 for the combined form. Like the WRAT-R, it has good psychometric properties (Wilkinson, 1993). Reliability, as measured by a coefficient Alpha, ranges from .85 to .95 over the 3 forms; test-retest reliability is .91 to .98. Correlations for the alternate forms over the age groups range from .87 to .99, with a median correlation of .92. The WRAT-III has three subtests (Reading, Spelling, and Arithmetic). Correlations between the WRAT-III and WRAT-R reading tests based on studies with children are: blue form (.90), tan form (.95), and combined form (.94).

### *Procedure*

Participants were randomly assigned to two conditions to control for possible order effects. Participants in one condition were tested on the English version of the MCMI-III during the first interview and on the Portuguese version of the MCMI-III after an interval of 6-14 days, on the second interview. Participants in the other condition took the English and Portuguese versions of the MCMI-III in an inverse order.

Participants in both conditions took the Reading subtest of the WRAT-III (tan form) during the second interview. The Reading subtest of the WRAT-III was used for subject screening and was administered only after the subjects had completed the two versions of the MCMI-III to prevent subjects who did not qualify for the study from feeling inadequate about their knowledge of English.

Data collection took place in different community locations (homes, churches, or business sites) to accommodate the subjects' preferences. It was considered the researchers' responsibility (or other qualified test administrator selected by the

researchers), however, to ensure that testing conditions were optimal before administering the tests.

## Results

We found an average item-by-item agreement of 90.5% (ranging from 44.4% to 100% agreement). Of the 175 items, 78 achieved 100% agreement, while only 2 items failed to achieve at least a 60% agreement rate (item 88 with 44.4% and item 32 with 55.6%). Agreement rates for all items are presented on Table 1.

Test-retest correlations for BR scores for all scales were also calculated and are presented on Table 2 along with first, second & difference means and standard deviations and Cohen's *d* statistic. The median correlation between versions was .83 (range = .07 to .96). The *d* values ranged from 0 to .6 (Median=.3).

## Discussion

The present paper outlined the methodology used for the translation of the MCMI-III into Brazilian-Portuguese and presented the results of the bilingual retest study. The results are encouraging and may suggest consistent measurement across cultures and linguistic equivalency between the original and the translated instrument. We are aware, however, that a linguistically equivalent translation does not necessarily indicate that both versions are comparable in all aspects that are important to ensure appropriate clinical and research use. Further studies to evaluate the psychometric properties of the translated instrument and its validity for use with Brazilians are now being conducted by our research team and represent the preliminary steps we have taken to provide method for future cross-cultural studies of personality using the translated Millon.

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**Table 1**

**Item by Item Agreement Rates Between Testings**

| Item | Pct. Agree | Item | Pct. Agree | Item | Pct. Agree | Item | Pct. Agree | Item | Pct. Agree | Item | Pct. Agree | Item | Pct. Agree |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 100.0 | 026 | 88.9 | 051 | 77.8 | 076 | 88.9 | 101 | 77.8 | 126 | 88.9 | 151 | 88.9 |
| 002 | 77.8 | 027 | 77.8 | 052 | 100.0 | 077 | 100.0 | 102 | 100.0 | 127 | 66.7 | 152 | 100.0 |
| 003 | 100.0 | 028 | 88.9 | 053 | 66.7 | 078 | 100.0 | 103 | 100.0 | 128 | 100.0 | 153 | 88.9 |
| 004 | 100.0 | 029 | 100.0 | 054 | 88.9 | 079 | 66.7 | 104 | 77.8 | 129 | 100.0 | 154 | 100.0 |
| 005 | 100.0 | 030 | 100.0 | 055 | 88.9 | 080 | 88.9 | 105 | 66.7 | 130 | 88.9 | 155 | 88.9 |
| 006 | 88.9 | 031 | 100.0 | 056 | 88.9 | 081 | 100.0 | 106 | 77.8 | 131 | 88.9 | 156 | 100.0 |
| 007 | 66.7 | 032 | 55.6 | 057 | 66.7 | 082 | 88.9 | 107 | 100.0 | 132 | 100.0 | 157 | 100.0 |
| 008 | 100.0 | 033 | 88.9 | 058 | 88.9 | 083 | 77.8 | 108 | 88.9 | 133 | 88.9 | 158 | 100.0 |
| 009 | 88.9 | 034 | 88.9 | 059 | 66.7 | 084 | 77.8 | 109 | 100.0 | 134 | 88.9 | 159 | 100.0 |
| 010 | 100.0 | 035 | 77.8 | 060 | 88.9 | 085 | 88.9 | 110 | 100.0 | 135 | 66.7 | 160 | 100.0 |
| 011 | 100.0 | 036 | 88.9 | 061 | 88.9 | 086 | 100.0 | 111 | 100.0 | 136 | 88.9 | 161 | 88.9 |
| 012 | 100.0 | 037 | 100.0 | 062 | 88.9 | 087 | 100.0 | 112 | 100.0 | 137 | 66.7 | 162 | 88.9 |
| 013 | 100.0 | 038 | 100.0 | 063 | 88.9 | 088 | 44.4 | 113 | 100.0 | 138 | 88.9 | 163 | 100.0 |
| 014 | 88.9 | 039 | 100.0 | 064 | 100.0 | 089 | 100.0 | 114 | 100.0 | 139 | 100.0 | 164 | 100.0 |
| 015 | 100.0 | 040 | 77.8 | 065 | 100.0 | 090 | 88.9 | 115 | 88.9 | 140 | 88.9 | 165 | 88.9 |
| 016 | 77.8 | 041 | 77.8 | 066 | 100.0 | 091 | 100.0 | 116 | 77.8 | 141 | 100.0 | 166 | 77.8 |
| 017 | 100.0 | 042 | 100.0 | 067 | 100.0 | 092 | 88.9 | 117 | 88.9 | 142 | 88.9 | 167 | 77.8 |
| 018 | 100.0 | 043 | 88.9 | 068 | 88.9 | 093 | 77.8 | 118 | 100.0 | 143 | 100.0 | 168 | 100.0 |
| 019 | 88.9 | 044 | 100.0 | 069 | 100.0 | 094 | 88.9 | 119 | 100.0 | 144 | 88.9 | 169 | 100.0 |
| 020 | 88.9 | 045 | 66.7 | 070 | 88.9 | 095 | 100.0 | 120 | 100.0 | 145 | 88.9 | 170 | 66.7 |
| 021 | 100.0 | 046 | 100.0 | 071 | 88.9 | 096 | 77.8 | 121 | 88.9 | 146 | 100.0 | 171 | 100.0 |
| 022 | 88.9 | 047 | 77.8 | 072 | 88.9 | 097 | 88.9 | 122 | 88.9 | 147 | 88.9 | 172 | 66.7 |
| 023 | 88.9 | 048 | 88.9 | 073 | 100.0 | 098 | 88.9 | 123 | 100.0 | 148 | 77.8 | 173 | 100.0 |
| 024 | 100.0 | 049 | 88.9 | 074 | 100.0 | 099 | 77.8 | 124 | 88.9 | 149 | 100.0 | 174 | 100.0 |
| 025 | 100.0 | 050 | 66.7 | 075 | 88.9 | 100 | 100.0 | 125 | 100.0 | 150 | 88.9 | 175 | 100.0 |

**Table 2**
**First vs. Second Testing Statistics**

| Scale | 1st Test Mean | 1st Test SD | 2nd Test Mean | 2nd Test SD | r | Difference Mean | Difference SD | d |
|---|---|---|---|---|---|---|---|---|
| 1 Schizoid | 52.9 | 18.8 | 53.7 | 18.3 | .65 | -0.8 | 15.5 | -0.0 |
| 2A Avoidant | 24.1 | 20.5 | 38.0 | 31.5 | .90** | -13.9 | 15.7 | -0.5 |
| 2B Depressive | 24.4 | 26.5 | 33.1 | 35.3 | .79* | -8.7 | 21.5 | -0.3 |
| 3 Dependent | 32.6 | 30.5 | 40.2 | 30.0 | .75* | -7.7 | 21.2 | -0.3 |
| 4 Histrionic | 62.3 | 13.1 | 59.8 | 18.3 | .78* | 2.6 | 11.5 | 0.2 |
| 5 Narcissistic | 69.8 | 14.4 | 65.8 | 16.7 | .93** | 4.0 | 6.2 | 0.3 |
| 6A Antisocial | 41.8 | 27.9 | 48.6 | 20.6 | .55 | -6.8 | 23.7 | -0.3 |
| 6B Aggressive/Sadistic | 40.3 | 25.4 | 46.0 | 19.7 | .83** | -5.7 | 14.3 | -0.2 |
| 7 Compulsive | 64.2 | 16.5 | 58.2 | 10.4 | .79* | 6.0 | 10.5 | 0.4 |
| 8A Passive-Aggressive | 28.2 | 16.8 | 39.2 | 21.5 | .94** | -11.0 | 8.0 | -0.6 |
| 8B Self-Defeating | 18.6 | 21.8 | 30.3 | 33.3 | .92** | -11.8 | 15.6 | -0.4 |
| S Schizotypal | 21.4 | 27.2 | 29.2 | 34.8 | .96** | -7.8 | 11.7 | -0.2 |
| C Borderline | 17.1 | 19.7 | 28.3 | 23.3 | .68* | -11.2 | 17.6 | -0.5 |
| P Paranoid | 26.0 | 28.9 | 23.3 | 26.3 | .93** | 2.7 | 10.5 | 0.1 |
| A Anxiety | 24.1 | 32.9 | 35.9 | 41.2 | .86** | -11.8 | 21.1 | -0.3 |
| H Somatoform | 16.9 | 26.9 | 17.7 | 28.4 | .85** | -0.8 | 15.2 | -0.0 |
| N Bipolar: Manic | 30.0 | 31.3 | 30.7 | 34.6 | .94** | -0.7 | 11.4 | -0.0 |
| D Dysthymia | 8.9 | 20.3 | 18.7 | 25.2 | -.07 | -9.8 | 33.5 | -0.4 |
| B Alcohol Dependence | 49.6 | 19.0 | 53.7 | 18.3 | .86** | -4.1 | 9.8 | -0.2 |
| T Drug Dependence | 40.1 | 23.5 | 47.6 | 23.6 | .57 | -7.4 | 21.8 | -0.3 |
| R PTSD | 8.3 | 10.9 | 18.3 | 23.5 | .76* | -10.0 | 16.8 | -0.5 |
| SS Thought Disorder | 16.9 | 19.0 | 17.8 | 26.5 | .89** | -0.9 | 12.7 | -0.0 |
| CC Major Depression | 9.8 | 20.0 | 18.2 | 28.1 | .76* | -8.4 | 18.2 | -0.3 |
| PP Delusional Disorder | 19.4 | 26.6 | 27.9 | 33.1 | .85** | -8.4 | 17.3 | -0.3 |
| Y Desirability | 77.8 | 14.2 | 70.3 | 10.8 | .76* | 7.4 | 9.3 | 0.6 |
| Z Debasement | 22.7 | 22.0 | 23.1 | 28.3 | .61 | -0.4 | 23.0 | -0.0 |
| X Disclosure | 37.8 | 20.3 | 43.9 | 19.1 | .92** | -6.1 | 7.7 | -0.3 |

** $p<.01$ *$p<.05$

# APPENDIX B

## Unpublished Manuscript

The Brazilian-Portuguese Version of the MCMI-III:
Update on the Results of the Reliability Study
Paper presented at the XXVII International Congress of Psychology, Beijing, China
(Magalhaes, E., Magalhaes, C., Sellers, A.; Lewis, J., Cruz, C. & Corga, D., 2004)

**PAPER PRESENTED AT THE XXVIII INTERNATIONAL CONGRESS OF PSYCHOLOGY, BEIJING, CHINA, AUGUST, 2004.**

# The Brazilian-Portuguese Version of the MCMI-III: Update on the Results of the Reliability Study

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A Brazilian-Portuguese version of the MCMI-III was developed to be used in future studies that will examine cross-cultural aspects of personality and psychopathology in Brazil and the United States. This paper presents the methodology used to evaluate the translation methodology for this endeavor (with its statistical results) and test-retest reliability of the translated instrument. For evaluation of the translation phase, using 9 bilingual participants, we found item-by-item agreement rates ranged from 44% to 100% (Median=90.4%) between English and Brazilian-Portuguese versions. The median correlation across the 27 scales was .83 (range = .07 to .96). For the test-retest phase, using 222 Brazilian college students, the median raw score correlation between first and second testing across the 27 scales was .82 (range = .48 to .86). These results are seen as encouraging and suggest consistency of measurement across time.

The Millon Clinical Multiaxial Inventory (MCMI) is currently one of the most popular instruments used for the assessment of adult psychopathology in the United States (Choca & Van Denburg, 1997). It has inspired a growing number of studies since its first publication in 1977 and now, in its third version, occupies a central place in many clinical settings (Craig, 1997). Several translations and adaptations of the Millon Inventories to other languages have been reported in the literature and are currently being used in many other countries (e.g. Sloore & Derksen, 1997; Mortensen & Simonsen, 1990; Luteijn, 1990).

Because of its solid theoretical foundation, the MCMI seems particularly appropriate for cross-cultural applications (Escovar, 1997), allowing for the assessment of personality disorders and clinical syndromes at a basic, theoretical level. Moreover, the instrument's consonance with the DSM-IV and ICD-10 facilitates the interpretation and reporting of results according to the current psychiatric nosology used in many countries (Millon & Millon, 1997).

Due to the demand for psychological instruments that can be appropriately used with Portuguese speaking individuals of Brazilian heritage, we conducted a translation of the MCMI-III into Brazilian-Portuguese. Only a small number of instruments are now available for clinical and research purposes with a Brazilian population and a good part of these instruments are based on projective diagnostic approaches. There is a need for

self-report measures in Brazilian-Portuguese that are reliable, easy to use in a variety of clinical settings, and up-to-date with the most current theories of personality and psychopathology.

The current literature provides several guidelines for the translation and adaptation of psychological instruments for cross-cultural use (see Van de Vijver & Hambleton, 1996, for a comprehensive description of potential sources of bias and recommended practices). The translation/back translation procedure is considered standard by most test translators and is used to evaluate whether original item content is preserved or changed in the translated version. In this procedure, the translated items are translated back into the source language and then compared with the original version of the instrument to check for content discrepancies. Although this method seems to be a common procedure among test translators (e.g. Sloore & Derksen 1997; Saito, Nomura, Noguchi & Tezuka, 1996), the literature advises that it should be used with caution. According to Geisinger (1994), research has found that test translators, when knowing that their work will be subject to back translation, tend to use wording that ensures a good match between back translation and original version, rather than one that accurately reproduces the original content of the items. Moreover, readability and fluency of the text tend to be neglected when back translation procedures are employed (Van de Vijver & Hambleton, 1996). Other authorities in the field have concluded, however, that back translation is a valuable tool despite its limitations and should be employed by test translators (Butcher, 1996).

As an alternative technique to back translation, the use of revisers has been suggested by Geisinger (1994). He recommended having a group of individuals carefully review all translated items, make comments about the quality of the translation, and discuss with test translators alternative wording for problem-items. This review process is also expected to minimize the potential for translation bias as well as to enhance the quality of the final product.

Another recommended practice is the use of a committee approach to translation (Butcher, 1998; Sloore & Derksen 1997; Saito et al, 1996; Butcher, 1996). Rather than having only one person translate the instrument, the literature suggests having members of a translation team make the translation of all items independently and later integrate their work into one version on the basis of discussion. The committee members should be not only fluent in both languages but also knowledgeable about both cultures and the constructs being measured (Geisinger, 1994).

Furthermore, in order to evaluate the linguistic accuracy of a translated instrument, a pilot study using bilingual individuals should be carried out (Butcher, 1998; Sloore & Derksen, 1997; Butcher, 1996; Saito et al., 1996). In this method, both versions are administered to a sample of bilingual subjects to detect problems with particular items and evaluate the reliability of the instrument across versions. Frequent discrepancies between same items are expected to indicate possible translation problems and would suggest the need for further refinement of the translated item. Genuine cultural differences that may account for these discrepancies should be also investigated (Butcher, 1996).

Finally, the stability of the translated instrument should be tested in the target culture with a test-retest design (Paunonen & Ashton, 1998). The correlation coefficients obtained are expected to approximate the test-retest reliability coefficients reported in the literature for the original version of the instrument.

The purpose of the present paper is to describe the methodology used for the translation of the MCMI-III into Brazilian-Portuguese and to present the preliminary psychometric results obtained with a sample of Brazilian college students in Rio de Janeiro and Sao Paulo (Brazil). As noted above, correlations are expected to approximate the test-retest reliability of the original MCMI-III reported in the manual (Millon, 1994). Further studies will be required to evaluate the

validity of the new instrument for use with a Brazilian population. Validity-threatening factors related to the construct being measured (construct bias) and to instrument administration (method bias) should be examined in the future to ensure appropriate clinical and research use (Van de Vijver & Hambleton, 1996).

## Method

### *Translation Procedures*

Our research team used a combination of the translation practices discussed in the literature (Butcher, 1998; Sloore & Derksen, 1997; Saito et al, 1996; Butcher, 1996; Van de Vijver & Hambleton, 1996; Geisinger, 1994). The initial translation was conducted independently by two bilingual Brazilians (two of the authors) and integrated on the basis of discussion. The integrated version was then revised by two bilingual research assistants with extensive experience in both cultures who made important comments and suggestions regarding each item. However, because the revisers were not familiar with the content of the MCMI-III, their suggestions were analyzed by the translation committee who made the necessary adjustments to the items before submitting them to the back translation procedure.

When working on the items independently, the translation committee and the revisers were instructed to keep several principles in mind: (1) if possible, maintain the original wording and sentence construction; (2) if necessary, modify the wording and/or sentence construction making changes as minimal as possible; (3) try to use words and sentences that are easy to understand; (4) if there is more than one way an item can be translated, choose the most simple one; (5) if necessary, use explanatory words/sentences within parenthesis to clarify words that have ambiguous meaning.

Back translation was conducted by another Brazilian research assistant with extensive experience in both cultures. The back translated items were latter compared to the original items by an American research assistant who had no knowledge of Portuguese. When discrepancies were found between back translated items and their correspondent items in the original version, the translation committee and the back translator worked together to detect the reason for the problems, generate alternative formulations, and prepare the version used in the bilingual retest study.

### *Bilingual Retest*

#### *Participants*

Potential subjects were recruited from the community on the basis of their availability. They were contacted informally through schools, churches, and businesses that serve the Brazilian community in Dade and Broward Counties (Florida, USA). They were informally approached by the investigators and invited to participate in the study by responding anonymously to the assessment materials. At this time they received a brief explanation of the purpose of the study and were assured of their anonymity.

Criteria for inclusion in this study were: (1) subject's willingness to participate; (2) above 18 years of age; (3) above 8 years of education; and (4) ability to speak and read English and Brazilian-Portuguese. Subjects were excluded from the study if they scored below the 8$^{th}$ Grade level on the reading subtest of the Wide Range Achievement Test - 3rd Ed. (WRAT-III; Wilkinson, 1993).

A total number of twenty-one Brazilian individuals fluent in Brazilian-Portuguese and English volunteered for this study. From this group, ten volunteers failed to appear for the second interview and two did not meet criteria for inclusion in the study. The remaining participants were 5 males and 4 females with ages ranging from 34 to 58 (Mean = 41.7) and years of education ranging from 10 to 22 (Mean = 12.7).

#### *Instrumentation*

***Millon Clinical Multiaxial Inventory - III.*** The MCMI-III (Millon, 1994) is a 175-item instrument composed of 11 clinical personality scales, 3 severe personality pathology scales, 7 clinical syndrome scales, 3 severe syndrome scales, and 4 modifying indices scales. Due to the norming of the

MCMI-III on psychiatric patients, base rates (BR) are employed rather than standard scores. A BR score of ≥ 75 on a given scale indicates that feature is present in the individual's personality, while a BR score of ≥ 85 indicates that feature is prominent in the composition of their personality. Strengths of the MCMI-III include its norming on a psychiatric population, its brevity, and its ease of administration. Moreover, the Millon inventories appeal to many professionals as they define personality traits using nomenclature with which clinicians are accustomed (Choca & Van Denburg, 1997; McCabe, 1984). According to Millon (1994), internal consistency (alpha) coefficients exceed .80 for 20 of the 26 scales. Also, the median stability coefficient, based on two test administrations between five and 14 days apart, was .91. Regarding validity, Millon reported that correlations between scale BR scores and collateral instruments (e.g., BDI, MMPI-2, SCL-90-R) were generally favorable.

***Wide Range Achievement Test - III.*** The WRAT-III has one level for ages 5-75. There are three forms (blue, tan, and combined). The total number of possible points for each of the alternate forms (blue, tan) is 57, and 99 for the combined form. Like the WRAT-R, it has good psychometric properties (Wilkinson, 1993). Reliability, as measured by a coefficient Alpha, ranges from .85 to .95 over the 3 forms; test-retest reliability is .91 to .98. Correlations for the alternate forms over the age groups range from .87 to .99, with a median correlation of .92. The WRAT-III has three subtests (Reading, Spelling, and Arithmetic). Correlations between the WRAT-III and WRAT-R reading tests based on studies with children are: blue form (.90), tan form (.95), and combined form (.94).

### *Procedure*

Participants were randomly assigned to two conditions to control for possible order effects. Participants in one condition were tested on the English version of the MCMI-III during the first interview and on the Portuguese version of the MCMI-III after an interval of 6-14 days, on the second interview. Participants in the other condition took the English and Portuguese versions of the MCMI-III in an inverse order.

Participants in both conditions took the Reading subtest of the WRAT-III (tan form) during the second interview. The Reading subtest of the WRAT-III was used for subject screening and was administered only after the subjects had completed the two versions of the MCMI-III to prevent subjects who did not qualify for the study from feeling inadequate about their knowledge of English.

Data collection took place in different community locations (homes, churches, or business sites) to accommodate the subjects' preferences. It was considered the researchers' responsibility (or other qualified test administrator selected by the researchers), however, to ensure that testing conditions were optimal before administering the tests.

### *Results*

We found an average item-by-item agreement of 90.5% (ranging from 44.4% to 100% agreement). Of the 175 items, 78 achieved 100% agreement, while only 2 items failed to achieve at least a 60% agreement rate (item 88 with 44.4% and item 32 with 55.6%). Test-retest correlations for BR scores for all scales were also calculated (median correlation = .83; range = .07 to .96). The *d* values ranged from 0 to .6 (Median=.3).

These results were seen as encouraging and suggestive of consistent measurement across cultures. Items with lower than 80% agreement were subsequently revised by the translation committee who worked together to detect the reason for the problems and to generate alternative formulations before preparing the final version used in the retest study in Brazil. Because the subjects reported having difficulty understanding certain items in the English version during test administration, their limited comprehension of English was also considered as a possible explanation for the low agreement achieved with particular items.

## *Test-Retest in Brazil*

### *Participants*

A total of two hundred and thirty five Brazilian College students residing in Rio de Janeiro and Sao Paulo (Brazil) were recruited for this study. They were contacted during class hours by a member of our research team and invited to participate by responding anonymously to the assessment materials. One point toward the final grade was offered as an incentive for participation.

The subjects were fully informed about the procedures involved, the risks and benefits associated with their participation, and their right to withdraw from the study at any time. Confidentiality was assured and those who agreed to participate were asked to sign an Informed Consent Form. The criteria for inclusion in this study were: (1) subject's willingness to participate; and (2) above 18 years of age.

Only a subset of the total data (n=45) was analyzed in time to be included in this report. The sub-sample consisted of 44 female and 1 male students with an average of 25.7 years of age (SD=8.3) and 15.5 years (SD=3.2) of education.

***Procedure***

Each participant was twice administered the Brazilian-Portuguese translation of the third edition of the Millon Clinical Multiaxial Inventory (MCMI3-BP) during class hours. The interval between the first and second administrations varied somewhat but was about two weeks on average (Mean=13 days, SD=2.2). Information regarding the participants' past and current psychiatric history, as well as substance use and trauma, were also collected and will be presented in future reports.

***Results***

Stability coefficients were computed by calculating the Pearson correlations between scores produced at the first and second testings. These are shown in Table 1 for both the raw scores and the base rate (BR) scores. The median correlation between first and second testing across the 27 scales was .82 (range = .41 to .92) for raw scores and .79 (range=.49 to .87) for base rates. These results are seen as encouraging and suggest consistency of measurement across time.

## Discussion

The present paper outlined the methodology used for the translation of the MCMI-III into Brazilian-Portuguese and presented the preliminary psychometric results obtained with a sample of Brazilian college students. These results are encouraging and suggest that the translated instrument is reliable and comparable to the original MCMI-III. Correlations for all but the substance abuse scales were above .6 and significant at .001 level. Since the participants in this study were students, it's not surprising that there would be some inconsistency in their responses to items measuring alcohol and drug dependence.

We are aware, however, that a psychometrically equivalent translation does not necessarily indicate that both versions are comparable in all aspects that are important to ensure appropriate clinical and research use. Further studies to evaluate its validity for use with Brazilians are now being conducted by our research team and represent the preliminary steps we have taken to provide method for future cross-cultural studies of personality using the translated Millon.

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**Table 1**

***Stability Coefficients for BP-MCMI-III Raw and BR Scores***

| Scale | Raw | BR |
|---|---|---|
| 1 Schizoid | .781** | .791** |
| 2A Avoidant | .864** | .867** |
| 2B Depressive | .925** | .864** |
| 3 Dependent | .851** | .833** |
| 4 Histrionic | .698** | .786** |
| 5 Narcissistic | .733** | .730** |
| 6A Antisocial | .731** | .765** |
| 6B Aggress/Sadistic | .756** | .784** |
| 7 Compulsive | .829** | .845** |
| 8A Passive/Aggressive | .776** | .747** |
| 8B Self-Defeating | .875** | .795** |
| S Schizotypal | .804** | .647** |
| C Borderline | .869** | .864** |
| P Paranoid | .830** | .784** |
| A Anxiety | .705** | .682** |
| H Somatoform | .868** | .819** |
| N Bipolar: Manic | .817** | .836** |
| D Dysthymia | .781** | .752** |
| B Alcohol Dep | .697** | .576** |
| T Drug Dep | .849** | .572* |
| R PTSD | .819** | .732** |
| SS Thought D/O | .797** | .803** |
| CC Major Depression | .878** | .863** |
| PP Delusional D/O | .789** | .775** |
| Y Desirability | .729** | .713** |
| Z Debasement | .869** | .820** |

| | | | |
|---|---|---|---|
| X Disclosure | .860** | .855** | |

* p<.01 ** p<.001

# APPENDIX C

## Informed Consent (English Version)
## Validity of the Substance Abuse Scales of the Brazilian-Portuguese MCMI-III

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Date of Approval: 07/15/04
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### I. Description of the Study:

I understand that Cristina Magalhães is a doctoral student at Nova Southeastern University engaged in research for the purpose of fulfilling a requirement for the Doctor of Psychology Degree. I further understand that this research seeks to evaluate the validity of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (MCMI-III) for assessing substance abuse problems in the Brazilian population.

The MCMI-III is a psychological test that was designed to measure personality traits and clinical syndromes in individuals with different types of problems, including substance abuse. This test was originally developed in the English language and has been considered valid for use with people who live in the United States. The researchers are interested in evaluating whether it can be useful for assessing substance abuse problems among Brazilians as well.

The MCMI-III is composed of 175 statements and individuals completing the test must indicate whether they think these statements are true or false for them. Examples of these statements are: "I think I am a very sociable and outgoing person" and "I often allow others to make important decisions for me." If I decide to participate in this study, I will be answering three small questionnaires (10 - 11 questions each) in addition to the MCMI-III. The purpose of these questionnaires is to gather information about my age, gender, marital status, educational and occupational level, history of alcohol problems and drug abuse, history of substance abuse treatment. By matching my MCMI-III answers with the information gathered through the questionnaires, the researchers will be able to determine whether or not the MCMI-III was helpful in assessing my substance abuse behavior.

The person administering the MCMI-III and questionnaires will strive to arrange the testing session to accommodate my schedule. Only one testing session will be required. This session is expected to last between 30 to 40 minutes. No follow-up interview will be needed

### II. Risks and Benefits

I understand that there is no direct benefit to me for agreeing to be in this study. The researchers will not interpret the overall results of my test and will not be able to provide me with information about my scores.

One possible risk to me is that I may initially feel uncomfortable taking the test because it will require answering items about my attitudes toward aspects of my life that I may consider private. However, I don't

have to identify myself by name on the answer sheets and, therefore, my answers can not be traced back to me. If I have any concerns about my participation in this study, I can discuss them with the research associate in charge of data collection, Monica Schaly, whose phone number is listed above.

**III. Costs and Payments**

Participation in this study is voluntary and involves no costs to me. I understand that I will not receive payment for my participation.

**IV. Confidentiality**

All information obtained will be keep strictly confidential unless disclosure is required by Brazilian or United States law. I understand that I don't need to identify myself by name on the test answer sheets. Instead, I will be asked to use a number to help the researchers match my answers on the primary test with my answers on other testing materials without knowing they belong to me. To further protect my identity, any publications from this study will be written without identifying information. I understand that the protection of my identity is regarded as an issue of the utmost importance by the researchers and that my confidentiality will be safeguarded.

If I am a patient at the Pater-Aldeia Clinic, Santa Casa de Misericórdia Hospital, or Primeira Clinica Popular do Estado do Rio de Janeiro I authorize Monica Schaly to have access to my medical records at the Pater-Aldeia Clinic, Santa Casa de Misericórdia Hospital or Primeira Clinica Popular do Estado do Rio de Janeiro. The purpose of this authorization is to allow the researcher to get information about my diagnosis. I understand that I can revoke this authorization at any time by providing a signed written statement to Monica Schaly. Although I will not be able to participate in the study procedures if I decide not to give the authorization, my treatment at the Pater-Aldeia Clinic, Santa Casa de Misericórdia Hospital, or Primeira Clinica Popular do Estado do Rio de Janeiro will not be affected in any way by my refusal to authorize the researcher's access to my records. If I allow this transfer of information from my medical file, the researchers will protect the confidentiality of this information as discussed in the Confidentiality section above.

**V. Right to Withdraw**

I understand that I may discontinue the testing at any time either during or after the study and have all my answers destroyed unless prohibited by state or federal law. If any significant new information relating to the study becomes available which may relate to my willingness to continue to participate, this information will be provided to me by the investigators.

**VI. Voluntary Consent**

**I have read the preceding consent form, or it has been read to me, and I fully understand the contents of this document and voluntarily consent to participate. All of my questions concerning the research have been answered. I hereby agree to participate in this research study. If I have any questions in the future about this study they will be answered by Monica Schaly or any of the other researchers. If I am a client at the Pater-Aldeia Clinic, Santa Casa de Misericórdia Hospital, or Primeira Clinica Popular do Estado do Rio de Janeiro I also voluntarily agree to the release of my medical diagnosis as described in this document. For questions relating to my rights as a participant of this study, I can contact the president of the Research Ethics Committee of the Núcleo de Estudos em Saúde Coletiva do Rio de Janeiro, Dr. Marisa Palácios, at (021) 2598-9278. A copy of this form has been given to me. This consent ends at the conclusion of this study.**

_____

Participant's Signature Date

_____

Witness Signature Date

# APPENDIX D

## Informed Consent (Portuguese Version)

### Validade da escala de abuso de substâncias químicas da versão brasileira do MCMI-III

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**Comitê de Ética da Universidade:**
Número do projeto: CPS07060401X
Data de aprovação: 15/07/04
Agência patrocinadora: nenhuma
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**I. Descrição do estudo:**

Fui informado(a) de que a pesquisadora Cristina Magalhães está conduzindo um estudo científico com o objetivo de cumprir os requerimentos do seu curso de doutorado em Psicologia Clínica pela Nova Southeastern University. Também fui informado(a) de que este estudo tem por objetivo avaliar a validade da versão brasileira do Inventório Clínico e Multiaxial-III (MCMI-III) para o diagnóstico de problemas de abuso de substâncias químicas na população brasileira.

O MCMI-III é um teste psicológico que foi desenvolvido com o objetivo de facilitar a identificação de vários distúrbios de personalidade e síndromes clínicas em pessoas com diferentes tipos de problemas, inclusive abuso de substâncias químicas. Este teste foi originalmente desenvolvido em inglês e é considerado válido para utilização com pessoas que vivem nos Estados Unidos. Os pesquisadores estão interessados em avaliar se este teste também pode ser útil no diagnóstico de problemas de abuso de substâncias químicas em brasileiros.

O MCMI-III é composto de 175 frases (declarações), e as pessoas que participam deste teste devem indicar se pensam que essas frases se aplicam ou não a elas (se são verdadeiras ou falsas). Exemplos dessas frases são: "Eu me considero uma pessoa muito sociável e extrovertida" e "Eu costumo deixar que outros tomem decisões importantes por mim". Se eu decidir participar deste estudo, estou ciente de que, além do MCMI-III, vou responder a três pequenos questionários (10 a 11 questões). O objetivo destes questionários é coletar informações sobre a minha idade, sexo, estado civil, ocupação, educação, histórico de problemas com abuso de substâncias químicas e tratamentos. Comparando as minhas respostas no MCMI-III com as informações obtidas através destes questionários, os pesquisadores serão capazes de avaliar se o MCMI-III foi ou não útil para identificar o meu comportamento em termos de uso de substâncias químicas.

A pessoa responsável por administrar o teste fará o possível para que a sessão de testagem seja realizada segundo a minha conveniência. Somente uma sessão de testagem será necessária, e esta deverá durar de 30 a 40 minutos. Não será necessária nenhuma sessão para entrega de resultados.

**II. Riscos e benefícios**

Estou ciente de que não serei beneficiado(a) diretamente por participar deste estudo. Os pesquisadores não irão produzir uma interpretação geral das minhas respostas e, portanto, não poderão me fornecer informações sobre o meu resultado.

Se eu participar deste estudo, o único risco que posso correr é o de me sentir um pouco constrangido(a) por estar respondendo a perguntas sobre aspectos da minha vida que considero privados. Entretanto, sei que não precisarei me identificar pelo meu nome nas folhas de resposta e, portanto, que minhas respostas não poderão ser reconhecidas como pertencentes a mim. Se eu tiver qualquer pergunta referente à minha participação neste estudo, sei que posso contatar a pessoa responsável pela coleta de dados, Monica Schaly, cujo número telefônico está listado acima.

**III. Custos e gratificações**

Minha participação neste estudo é voluntária. Eu compreendo que não receberei nenhum incentivo financeiro pela minha participação.

**IV. Confidencialidade**

Todas as informações obtidas pelos pesquisadores serão consideradas de caráter confidencial, a menos que a divulgação das mesmas seja exigida pela legislação brasileira ou norte-americana. Eu compreendo que não preciso me identificar pelo meu nome nas folhas de resposta, mas sei que serei instruído(a) a usar um número de identificação para que os pesquisadores possam combinar minhas folhas de resposta sem saber que pertencem a mim. Para proteger minha identidade, qualquer publicação futura a respeito deste estudo será feita de modo a que nenhuma informação possa identificar qualquer um dos participantes. Eu compreendo que a proteção da minha identidade é considerada um assunto de grande importância para os pesquisadores e que minha confidencialidade será preservada.

Caso eu seja um paciente na Clínica Pater-Aldeia, Santa Casa de Misericórdia do Rio de Janeiro, ou 1ª Clínica Popular do Estado do Rio de Janeiro, autorizo Mônica Schaly a ter acesso ao meu prontuário médico da clínica/hospital. O propósito desta autorização é conceder permissão aos pesquisadores para que possam obter informações sobre o meu diagnóstico. Eu compreendo que posso revogar essa autorização a qualquer momento, entregando um pedido por escrito à Mônica Schaly. Caso eu decida não autorizar o acesso dos pesquisadores ao meu prontuário médico, sei que não poderei participar da pesquisa, mas entendo que o meu tratamento na Clínica Pater-Aldeia, Santa Casa de Misericórdia do Rio de Janeiro, ou 1ª Clínica Popular do Estado do Rio de Janeiro, não será alterado ou prejudicado de forma alguma. Se eu permitir o acesso dos pesquisadores ao meu prontuário médico, eles protegerão a confidencialidade dessas informações conforme discutido no parágrafo acima.

**V. Direito de desistência**

Eu compreendo que tenho o direito de interromper minha testagem e pedir que todas as minhas respostas sejam destruídas (durante ou depois de o estudo ter sido concluído), exceto em situações em que tal procedimento seja proibido pela legislação estadual ou federal. Se alguma informação nova a respeito desse estudo se tornar disponível e puder ter alguma influência na minha decisão de participar, esta informação me será fornecida pelos pesquisadores.

**VI. Consentimento voluntário**

**Atesto que li este consentimento de participação (ou me foi lido por outra pessoa), compreendo totalmente o conteúdo deste documento, e concordo em participar voluntariamente desta pesquisa. Todas as minhas dúvidas referentes a este estudo foram respondidas. Eu concordo em participar deste estudo. Se no futuro tiver perguntas a respeito deste estudo, sei que serão respondidas por Mônica Schaly ou qualquer um dos outros pesquisadores. Caso eu seja um paciente da Clínica Pater-Aldeia, Santa Casa de Misericórdia do Rio de Janeiro, ou 1ª Clínica Popular do Estado do Rio de Janeiro, também voluntariamente concordo com o acesso dos pesquisadores ao meu diagnóstico médico, conforme descrito neste documento. Para questões relacionadas aos seus direitos como paciente do estudo de pesquisa, contate a Presidente do Comitê de Ética em Pesquisa do Núcleo de Estudos em Saúde Coletiva do Rio de Janeiro, Dra. Marisa Palácios, tel: 2598 9278. Recebi uma cópia deste consentimento de participação. Este consentimento será válido somente até a conclusão deste estudo.**

_____

Assinatura do(a) participante voluntário(a) da pesquisa Data

_____

Assinatura da testemunha Data

# APPENDIX E

## The Alcohol Dependence Scale Composition and Item Weighing for the Original and Translated Versions of the MCMI-III (Millon, 1997).

True Prototypal Items (weigh = 2)

| | | |
|---|---|---|
| 52 | I have an alcohol problem that has made difficulties for me and my family. | Eu tenho um problema com bebida alcoólica, que já gerou dificuldades para mim e minha família. |
| 77 | I have a great deal of trouble trying to control an impulse to drink to excess. | Eu tenho bastante dificuldade de controlar um impulso de beber em excesso. |
| 100 | I guess I'm no different from my parents in becoming somewhat of an alcoholic. | Eu acho que não sou diferente dos meus pais em me tornar um pouco alcoólatra. |
| 131 | Drinking alcohol helps when I'm feeling down. | Tomar bebida alcoólica ajuda quando me sinto deprimido. |
| 152 | I have a drinking problem that I've tried unsuccessfully to end. | Eu tenho um problema com bebida alcoólica que já tentei acabar, mas não fui bem sucedido. |

True Nonprototypal Items (weigh = 1)

| | | |
|---|---|---|
| 14 | Sometimes I can be pretty rough and mean in my relations with my family. | Ás vezes sou bastante rude e perverso com a minha família. |
| 41 | I've done a number of stupid things on impulse that ended up causing me a great trouble. | Já fiz várias coisas estúpidas sem pensar, que acabaram me causando grandes problemas. |
| 64 | I don't know why, but I sometimes say cruel things just to make others unhappy. | Não sei porque, mas às vezes eu falo coisas cruéis só para fazer os outros infelizes. |
| 93 | There are members of my family who say I'm selfish and think only of myself. | Alguns membros da minha família dizem que sou egoísta e que só penso em mim mesmo. |
| 101 | I guess I don't take many of my family responsibilities as seriously as I should. | Eu acho que não levo muitas das minhas responsabilidades familiares tão à sério quanto deveria. |
| 113 | I've gotten into trouble with the law a couple of times. | Eu me envolvi em problemas com a lei algumas vezes. |
| 122 | I seem to make a mess of good opportunities that come my way. | Parece que estrago as boas oportunidades que me surgem. |
| 139 | I'm very good at making up excuses when I get into trouble. | Eu sou muito bom em inventar desculpas quando me envolvo em encrencas. |
| 166 | I act quickly much of the time and don't think things through as I should. | Na maioria das vezes eu ajo impulsivamente e sem pensar nas consequências como deveria. |

False Prototypal Item (weight = 2)

| | | |
|---|---|---|
| 23 | Drinking alcohol has never caused me any real problems in my work. | Bebida alcoólica nunca me causou grandes problemas no meu trabalho. |

# APPENDIX F

## The Drug Dependence Scale Composition and Item Weighing for the Original and Translated Versions of the MCMI-III (Millon, 1997)

True Prototypal Items (weigh = 2)

| | | |
|---|---|---|
| 13 | My drug habits have often gotten me into a good deal of trouble in the past. | Meu uso de drogas já me causou muitos problemas no passado. |
| 39 | Taking so-called illegal drugs may be unwise, but in the past I found I needed them. | Fazer uso de drogas ilegais pode ser uma imprudência, mas no passado eu precisei delas. |
| 66 | My habit of abusing drugs has caused me to miss work in the past. | Meu hábito de abusar de drogas me fez perder dias de trabalho. |
| 91 | My use of so-called illegal drugs has led to family arguments. | Meu uso de drogas ilegais já causou discussões de família. |
| 118 | There have been times when I couldn't get through the day without some street drugs. | Ja existiram épocas em que eu não conseguia passar o dia sem usar drogas. |
| 136 | I know I've spent more money than I should buying illegal drugs. | Eu sei que gastei mais dinheiro do que deveria comprando drogas. |

True Nonprototypal Items (weigh = 1)

| | | |
|---|---|---|
| 7 | If my family puts pressure on me, I'm likely to feel angry and resist doing what they want. | Quando a minha família me pressiona, eu costumo ficar zangado e procuro não fazer o que eles querem. |
| 21 | I like to flirt with members of the opposite sex. | Gosto de flertar (paquerar) com as pessoas do sexo oposto. |
| 38 | I do what I want without worrying about its effect on others. | Faço o que quero sem me preocupar como isso afeta os outros. |
| 41 | I've done a number of stupid things on impulse that ended up causing me great trouble. | Já fiz várias coisas estúpidas sem pensar, que acabaram me causando grandes problemas. |
| 53 | Punishment has never stopped me from doing what I wanted. | Nunca deixei de fazer o que eu queria por medo de ser castigado. |
| 101 | I guess I don't take many of my family responsibilities as seriously as I should. | Eu acho que não levo muitas das minhas responsabilidades familiares tão à sério quanto deveria. |
| 113 | I've gotten into trouble with the law a couple of times. | Eu me envolvi em problemas com a lei algumas vezes. |
| 139 | I'm very good at making up excuses when I get into trouble. | Eu sou muito bom em inventar desculpas quando me envolvo em encrencas. |

# APPENDIX G

## Diagnostic Questionnaire (English Version)

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## Past Use of Alcohol Questions

The following statements are about your alcohol use over the *past 12 months.* Please check ***YES*** for those statements that describe your drinking during the past 12 months, and check ***NO*** for those statements that are not true for you.

| | | Yes | No |
|---|---|---|---|
| 1. | In the past 12 months, I often used alcohol in larger amounts or over longer periods of time than I intended. | ☐ | ☐ |
| 2. | In the past 12 months, I often wanted to or tried to cut down or **control** my alcohol use. | ☐ | ☐ |
| 3. | In the past 12 months, I spent a lot of time either (a) using alcohol, (b) in activities trying to obtain alcohol, or (c) recovering from the effects of my drinking. | ☐ | ☐ |
| 4. | In the past 12 months, I gave up or reduced my involvement in important social, occupational, or recreational activities because of my alcohol use. | ☐ | ☐ |
| 5. | In the past 12 months, I continued to use alcohol despite knowing that it likely caused or made worse psychological or physical problems I had (e.g., continued drinking knowing it was making my ulcer or depression worse). | ☐ | ☐ |
| 6. | In the past 12 months, I found I needed **greater** amounts of alcohol than I use to in order to feel intoxicated or to get a desired effect, **OR** I got **much less** of an effect by using the same amount of alcohol as in the past. | ☐ | ☐ |
| **7.** | In the past 12 months, I experienced withdrawal symptoms when I tried to cut down or stop my drinking **OR** I drank alcohol to relieve or avoid withdrawal symptoms. **IF YES, PLEASE DESCRIBE YOUR WITHDRAWAL SYMPTOMS:** _____ | ☐ | ☐ |
| 8. | In the past 12 months, my continued alcohol use resulted in my not fulfilling major obligations at work, school, or home (e.g., repeated absences or poor performances at work or school; neglecting my children or home). | ☐ | ☐ |
| 9. | In the past 12 months, I repeatedly used alcohol in situations that were physically hazardous (e.g., driving a car or operating machinery). | ☐ | ☐ |
| 10. | In the past 12 months, my drinking has resulted in my having recurrent substance-related legal problems. | ☐ | ☐ |
| 11. | In the past 12 months, I continued to use alcohol despite having persistent or recurrent social or interpersonal problems caused or made worse by the effects of my drinking (e.g., arguments with friends or family about my drinking or physical fights). | ☐ | ☐ |

| | | | |
|---|---|---|---|
| **OFFICE USE ONLY** | If **3 or more YES** responses are given for **Items 1 through 7,** then the criteria for **dependence (303.90)** have been satisfied. | ☐ | ☐ |
| | If **1 or more YES** response(s) are given for **Items 8 through 11,** then the criteria for **abuse (305.00)** have been satisfied. | ☐ | ☐ |

# Past Use of Drug Questions

The following questions are about your use of the drug _____over the *past 12 months*. Please check *YES* for those statements that describe your use of _____ over the past 12 months, and check *NO* for those statements that are not true for you.

| | | Yes | No |
|---|---|---|---|
| 1. | In the past 12 months, I often used (**drug listed above**) in larger amounts or over longer periods of time than I intended. | ☐ | ☐ |
| 2. | In the past 12 months, I often wanted to or tried to cut down or **control** my use of (**drug listed above**). | ☐ | ☐ |
| 3. | In the past 12 months, I spent a lot of time either (a) using (**drug listed above**), (b) in activities trying to obtain **(drug listed above**), or (c) recovering from the effects of my use of **(drug listed above**). | ☐ | ☐ |
| 4. | In the past 12 months, I gave up or reduced my involvement in important social, occupational, or recreational activities because of my use of (**drug listed above**). | ☐ | ☐ |
| 5. | In the past 12 months, I continued to use (**drug listed above**) despite knowing that it likely caused or made worse psychological or physical problems I had (e.g., continued drug knowing it was making my hepatitis or depression worse. | ☐ | ☐ |
| 6. | In the past 12 months, I found that I needed **greater** amounts of (**drug listed above**) than I use to in order to feel intoxicated or to get a desired effect **OR** that I got **much less** effect by using the same amount of (**the drug listed above**) as in the past. | ☐ | ☐ |
| 7. | In the past 12 months, I experienced withdrawal symptoms when I tried to cut down or stop my use of use of (drug listed above) OR I took (drug listed above) to relieve or avoid withdrawal symptoms. IF YES, PLEASE DESCRIBE YOUR WITHDRAWAL SYMPTOMS: _____ _____ _____ ____ | ☐ | ☐ |
| 8. | In the past 12 months, my continued use of (**drug listed above**) resulted in my not fulfilling major obligations at work, school, or home (e.g., repeated absences or poor performances at work or school; neglecting my children or home). | ☐ | ☐ |
| 9. | In the past 12 months, I repeatedly used (**drug listed above**) in situations that were physically hazardous (e.g., driving a car or operating machinery). | ☐ | ☐ |
| 10. | In the past 12 months, my use of (**drug listed above**) has resulted in my having recurrent substance-related legal problems. | ☐ | ☐ |
| 11. | In the past 12 months, I continued to use (**drug listed above**) despite having persistent or recurrent social or interpersonal problems caused or made worse by the effects of my use of (e.g., arguments with friends or family about my drug use or physical fights). | ☐ | ☐ |

| | | | |
|---|---|---|---|
| **OFFICE USE ONLY** | If **3 or more YES** responses are given for **Items 1 through 7,** then the criteria for d**ependence** have been satisfied. | ☐ | ☐ |
| | If **1 or more YES** response(s) is given for **Items 8 through 11,** then the criteria for **abuse** have been satisfied. | ☐ | ☐ |

# APPENDIX H
# Diagnostic Questionnaire (Portuguese Version)

## Perguntas Relacionadas ao Consumo de Bebidas Alcoólicas

As perguntas a seguir referem-se ao seu consumo de bebidas alcoólicas nos últimos 12 meses. Favor responder SIM para os itens que descrevem corretamente o seu consumo de álcool nos últimos 12 meses e NÃO para os itens que não se aplicam a você.

| | | SIM | NÃO |
|---|---|---|---|
| 1. | Nos últimos 12 meses, tomei muitas vezes bebidas alcoólicas em quantidades maiores do que tinha planejado ou durante períodos mais longos do que tinha planejado. | ☐ | ☐ |
| 2. | Nos últimos 12 meses, quis muitas vezes parar de beber ou tentei diminuir ou controlar o meu consumo de bebidas alcoólicas. | ☐ | ☐ |
| 3. | Nos últimos 12 meses, perdi muito tempo usando bebidas alcoólicas, em atividades que tinham o propósito de obter bebidas alcoólicas, ou me recuperando dos efeitos do uso de bebidas alcoólicas. | ☐ | ☐ |
| 4. | Nos últimos 12 meses, por causa da bebida, parei ou reduzi o meu envolvimento em atividades importantes de caráter social, de trabalho, ou lazer. | ☐ | ☐ |
| 5. | Nos últimos 12 meses, continuei consumindo bebidas alcoólicas apesar de saber que o álcool estava causando ou agravando alguns dos meus problemas físicos ou psicológicos (por exemplo, continuei a beber mesmo sabendo que a bebida estava piorando a minha úlcera ou depressão). | ☐ | ☐ |
| 6. | Nos últimos 12 meses, precisei aumentar a quantidade de bebidas alcoólicas que consumia para poder me sentir intoxicado ou para conseguir o efeito desejado. **OU**, passei a sentir um efeito bem menor do que eu costumava sentir no passado bebendo a mesma quantidade de álcool. | ☐ | ☐ |
| 7. | Nos últimos 12 meses, senti sintomas de abstinência quando tentei diminuir ou parar de beber **OU** consumi bebidas alcoólicas para aliviar ou evitar sintomas de abstinência. SE A SUA RESPOSTA FOR SIM, FAVOR DESCREVER ABAIXO SEUS SINTOMAS DE ABSTINÊNCIA: _____ | ☐ | ☐ |
| 8. | Nos últimos 12 meses, não consegui desempenhar bem minhas funções no trabalho, escola ou casa por causa do meu uso contínuo de álcool (por exemplo, perdi muitos dias de trabalho ou escola; ou deixei de dar atenção aos meus filhos ou negligenciei a minha casa). | ☐ | ☐ |
| 9. | Nos últimos 12 meses, muitas vezes eu bebi em situações que eram perigosas e poderiam me causar danos físicos (por exemplo, dirigindo um carro ou manipulando máquinas). | ☐ | ☐ |
| 10. | Nos últimos 12 meses, tive vários problemas com a lei decorrentes do meu consumo de álcool. | ☐ | ☐ |
| 11. | Nos últimos 12 meses, continuei a beber embora tenha enfrentado problemas de relacionamento ou problemas sociais constantes ou recorrentes, os quais foram causados ou agravados pelos efeitos da bebida (por exemplo, discussões com amigos ou familiares sobre o meu consumo de álcool ou brigas). | ☐ | ☐ |

| | | | |
|---|---|---|---|
| **OFFICE USE ONLY** | If **3 or more YES** responses are given for **Items 1 through 7,** then the criteria for d**ependence** have been satisfied. | ☐ | ☐ |
| | If **1 or more YES** response(s) is given for **Items 8 through 11,** then the criteria for **abuse** have been satisfied. | ☐ | ☐ |

## Perguntas Relacionadas ao Uso de Drogas

As perguntas a seguir referem-se ao seu uso da droga _____ nos últimos 12 meses. Favor responder SIM para os itens que descrevem corretamente o seu uso de _____ nos últimos 12 meses e NÃO para os itens que não se aplicam a você.

| | | SIM | NÃO |
|---|---|---|---|
| 1. | Nos últimos 12 meses, usei muitas vezes a droga acima citada em quantidades maiores do que tinha planejado ou durante períodos mais longos do que tinha planejado. | ☐ | ☐ |
| 2. | Nos últimos 12 meses, quis muitas vezes parar de usar ou tentei diminuir ou controlar o meu uso da droga acima citada. | ☐ | ☐ |
| 3. | Nos últimos 12 meses, perdi muito tempo usando a droga acima citada, em atividades que tinham o propósito de obter a droga, ou me recuperando dos efeitos do uso da droga. | ☐ | ☐ |
| 4. | Nos últimos 12 meses, por causa da droga acima citada, parei ou reduzi o meu envolvimento em atividades importantes de caráter social, de trabalho, ou lazer. | ☐ | ☐ |
| 5. | Nos últimos 12 meses, continuei o uso da droga acima citada apesar de saber que estava causando ou agravando alguns dos meus problemas físicos ou psicológicos (por exemplo, continuei a usar a droga mesmo sabendo que estava piorando a minha hepatite ou depressão). | ☐ | ☐ |
| 6. | Nos últimos 12 meses, precisei aumentar a quantidade da droga acima citada que usava para poder me sentir intoxicado ou para conseguir o efeito desejado. **OU**, passei a sentir um efeito bem menor do que eu costumava sentir no passado usando a mesma quantidade da droga. | ☐ | ☐ |
| 7. | Nos últimos 12 meses, senti sintomas de abstinência quando tentei diminuir ou parar de usar a droga acima citada **OU** usei a droga para aliviar ou evitar sintomas de abstinência. SE A SUA RESPOSTA FOR SIM, FAVOR DESCREVER ABAIXO SEUS SINTOMAS DE ABSTINÊNCIA: _____ _____ | ☐ | ☐ |
| 8. | Nos últimos 12 meses, não consegui desempenhar bem minhas funções no trabalho, escola ou casa por causa do meu uso contínuo da droga acima citada (por exemplo, perdi muitos dias de trabalho ou escola; ou deixei de dar atenção aos meus filhos ou negligenciei a minha casa). | ☐ | ☐ |
| 9. | Nos últimos 12 meses, muitas vezes eu usei a droga acima citada em situações que eram perigosas e poderiam me causar danos físicos (por exemplo, dirigindo um carro ou manipulando máquinas). | ☐ | ☐ |
| 10. | Nos últimos 12 meses, tive vários problemas com a lei decorrentes do meu uso da droga acima citada. | ☐ | ☐ |
| 11. | Nos últimos 12 meses, continuei a usar a droga acima citada embora tenha enfrentado problemas de relacionamento ou problemas sociais constantes ou recorrentes, os quais foram causados ou agravados pelos efeitos da droga (por exemplo, discussões com amigos ou familiares sobre o meu uso da droga ou brigas). | ☐ | ☐ |

| | | | |
|---|---|---|---|
| **OFFICE USE ONLY** | If **3 or more YES** responses are given for **Items 1 through 7,** then the criteria for d**ependence** have been satisfied. | ☐ | ☐ |
| | If **1 or more YES** response(s) is given for **Items 8 through 11,** then the criteria for **abuse** have been satisfied. | ☐ | ☐ |

# APPENDIX I

## English Version of the Alcohol Use Disorders Identification Test[a]

| | |
|---|---|
| 1. How often do you have a drink containing alcohol?<br><br>(0) Never [Skip to Qs 9-10]<br>(1) Monthly or less<br>(2) 2 to 4 times a month<br>(3) 2 to 3 times a week<br>(4) 4 or more times a week | 6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?<br><br>(0) Never<br>(1) Less than monthly<br>(2) Monthly<br>(3) Weekly<br>(4) Daily or almost daily |
| 2. How many drinks containing alcohol do you have on a typical day when you are drinking?<br><br>(0) 1 or 2<br>(1) 3 or 4<br>(2) 5 or 6<br>(3) 7, 8, or 9<br>(4) 10 or more | 7. How often during the last year have you had a feeling of guilt or remorse after drinking?<br><br>(0) Never<br>(1) Less than monthly<br>(2) Monthly<br>(3) Weekly<br>(4) Daily or almost daily |
| 3. How often do you have six or more drinks on one occasion?<br><br>(0) Never<br>(1) Less than monthly<br>(2) Monthly<br>(3) Weekly<br>(4) Daily or almost daily | 8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?<br><br>(0) Never<br>(1) Less than monthly<br>(2) Monthly<br>(3) Weekly<br>(4) Daily or almost daily |
| 4. How often during the last year have you found that you were not able to stop drinking once you had started?<br><br>(0) Never<br>(1) Less than monthly<br>(2) Monthly<br>(3) Weekly<br>(4) Daily or almost daily | 9. Have you or someone else been injured as a result of your drinking?<br><br>(0) No<br>(2) Yes, but not in the last year<br>(4) Yes, during the last year |
| 5. How often during the last year have you failed to do what was normally expected from you because of drinking?<br><br>(0) Never<br>(1) Less than monthly<br>(2) Monthly<br>(3) Weekly<br>(4) Daily or almost daily | 10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?<br><br>(0) No<br>(2) Yes, but not in the last year<br>(4) Yes, during the last year |

[a]Babor, Higgins-Biddle, Saunders, & Monteiro, 2001.

# APPENDIX J

## Portuguese Version of the Alcohol Use Disorders Identification Test

| | |
|---|---|
| 1. Com que freqüência você consome bebidas alcoólicas?<br><br>(0) Nunca [vá para as questões 9-10]<br>(1) Mensalmente ou menos<br>(2) De 2 a 4 vezes por mês<br>(3) De 2 a 3 vezes por semana<br>(4) 4 ou mais vezes por semana | 6. Quantas vezes ao longo dos últimos 12 meses você precisou beber pela manhã para poder se sentir bem ao longo do dia após ter bebido bastante no dia anterior?<br><br>(0) Nunca<br>(1) Menos do que uma vez ao mês<br>(2) Mensalmente<br>(3) Semanalmente<br>(4) Todos ou quase todos os dias |
| 2. Quantas doses alcoólicas você consome tipicamente ao beber?<br><br>(0) 0 ou 1<br>(1) 2 ou 3<br>(2) 4 ou 5<br>(3) 6 ou 7<br>(4) 8 ou mais | 7. Quantas vezes ao longo dos últimos 12 meses você se sentiu culpado ou com remorso depois de ter bebido?<br><br>(0) Nunca<br>(1) Menos do que uma vez ao mês<br>(2) Mensalmente<br>(3) Semanalmente<br>(4) Todos ou quase todos os dias |
| 3. Com que freqüência você consome cinco ou mais doses de uma vez?<br><br>(0) Nunca<br>(1) Menos do que uma vez ao mês<br>(2) Mensalmente<br>(3) Semanalmente<br>(4) Todos ou quase todas os dias | 8. Quantas vezes ao longo dos últimos 12 meses você foi incapaz de lembrar o que aconteceu devido à bebida?<br><br>(0) Nunca<br>(1) Menos do que uma vez ao mês<br>(2) Mensalmente<br>(3) Semanalmente<br>(4) Todos ou quase todos os dias |
| 4. Quantas vezes ao longo dos últimos 12 meses você achou que não conseguiria parar de beber uma vez tendo começado?<br><br>(0) Nunca<br>(1) Menos do que uma vez ao mês<br>(2) Mensalmente<br>(3) Semanalmente<br>(4) Todos ou quase todos os dias | 9. Você já causou ferimentos ou prejuízos a você mesmo ou a outra pessoa após ter bebido?<br><br>(0) Não<br>(2) Sim, mas não nos últimos 12 meses<br>(4) Sim, nos últimos 12 meses |
| 5. Quantas vezes ao longo dos últimos 12 meses você, por causa do álcool, não conseguiu fazer o que era esperado de você?<br><br>(0) Nunca<br>(1) Menos do que uma vez ao mês<br>(2) Mensalmente<br>(3) Semanalmente<br>(4) Todos ou quase todos os dias | 10. Algum parente, amigo ou médico já se preocupou com o fato de você beber ou sugeriu que você parasse?<br><br>(0) Não<br>(2) Sim, mas não nos últimos 12 meses<br>(4) Sim, nos últimos 12 meses |

# APPENDIX K

## Demographic Questionnaire

**Nº de Identificação**:
*Identification Number*

**Idade:**
*Age*

**Local de Coleta de Dados:**
*Data Collection Site*

(1) Santa Casa (3) Igreja Betânia (5) Clinica Popular
(2) Pater-Aldeia (4) Igreja Congregacional

**Sexo**:
*Gender*

(1) masculino *male* (2) feminino *female*

**Estado Civil:**
*Marital Status*

(1) solteiro/solteira *single*
(2) casado/casada *married*
(3) viúvo/viúva *widowed*
(4) separado ou divorciado *separated – divorced*

**Ocupação**:
*Type of Work*

(1) escritório *office*
(2) fábrica *factory*
(3) profissional liberal *professional*
(4) desempregado *unemployed*
(5) outro _____ *other*

**Escolaridade**:
*Educational Level*

Primário: (1) incompleto (2) completo
*elementary school* *incomplete* *complete*

Ginásio: (3) incompleto (4) completo
*middle school* *incomplete* *complete*

2º grau: (5) incompleto (6) completo
*high school* *incomplete* *complete*

Universitário: (7) incompleto (8) completo
*college* *incomplete* *complete*

Pós-Universitário (9) incompleto (10) completo
*graduate* *incomplete* *complete*

**Principal Razão para o Tratamento**:
*Primary Reason for Treatment*

(1) problemas com uso de álcool *alcohol problems*
(2) problemas com uso de drogas *drug problems*
(3) problemas com uso de álcool e drogas *alcohol and drug problems*

**Tratamentos Anteriores:**
*Treatment History*

*A.* **Quantas vezes você já recebeu tratamento para dependência ou abuso de alcool?**
*How many times in the past you received treatment for alcohol abuse/dependence?*

(1) nenhuma vez *never* (2) 1 - 2 vezes *1 – 2 times* (3) 3 – 4 vezes *3 – 4 times* (4) 5 ou mais vezes *5 or more times*

*B.* **Quantas vezes você já recebeu tratamento para dependência ou abuso de drogas?**
*How many times in the past you received treatment for drug abuse/dependence?*

(1) nenhuma vez *never* (2) 1 - 2 vezes *1 – 2 times* (3) 3 – 4 vezes *3 – 4 times* (4) 5 ou mais vezes *5 or more times*

**História de Uso:**
*History of Substance Use*

*A.* **Com que idade você começou a tomar bebidas alcoólicas? _____**
*At what age did you start drinking alcohol?*

*B.* **Com que idade você fez uso de drogas pela primeira vez? _____**
*At what age did you use illegal drugs for the first time?*

**Religião:**
*Religion*

(1) Nenhuma *none*
(2) Protestante *Protestant*
(3) Católica *Catholic*
(4) Espírita *Spiritism*
(5) Afro-Brasileira *Afro-Brazilian*
(6) Outra *other*

_____
_____

# APPENDIX L

## Instructions for Data Collection

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## INTRODUCTION

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This document provides instructions regarding the recruitment of participants and the administration of the assessment instruments for the study titled "the Brazilian-Portuguese MCMI-III: Diagnostic Validity of the Substance Dependence Scales." It is important that any one involved in the data collection phase of this project, read, understand, and abide by all procedures described in this document. The reliability of the results obtained at the end of this study directly depends on how well and uniform the data will be produced. In case this manual does not answer all your questions regarding the recruitment of the participants and the administration of the assessment procedures, please contact the principal investigator, Cristina Magalhaes, either by e-mail (magalhac@nova.edu) or by phone (954-568-1106 or 954-937-0240).

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## I. Purpose of the Study

This study seeks to evaluate the validity of the Brazilian-Portuguese version of the Millon Clinical Multiaxial Inventory-III (MCMI-III) for assessing substance abuse problems in the Brazilian population. The MCMI-III is a psychological test that was designed to measure personality traits and clinical syndromes in individuals with different types of problems, including substance abuse. This test was originally developed in the English language and has been considered valid for use with people who live in the United States. The researchers are interested in evaluating whether it can be useful for assessing substance abuse problems among Brazilians as well.

The MCMI-III is composed of 175 statements and individuals completing the test must indicate whether they think these statements are true or false for them. Examples of these statements are: "I think I am a very sociable and outgoing person" and "I often allow others to make important decisions for me." If they decide to participate in this study, they will be answering three small questionnaires (10 - 11 questions each) in addition to the MCMI-III. The purpose of these questionnaires is to gather information about their age, gender, marital status, educational and occupational level, history of alcohol problems and drug abuse, history of substance abuse treatment. By matching the participants' MCMI-III answers with the information gathered through the questionnaires, the researchers will be able to determine whether or not the MCMI-III was helpful in assessing their substance abuse behavior.

## II. Assessment Measures

### A. Description

***1) MCMI-III.*** The MCMI-III is a psychological test that was designed to measure personality traits and clinical syndromes in individuals with different types of problem. It has a total of 27 subscales: (a) 3 for estimating the individual's test-taking attitude, (b) 14 for measuring different personality styles, and (c) 10 for assessing the presence of clinical syndromes, including anxiety, depression, psychotic disorders, posttraumatic stress, and substance abuse/dependence.

The MCMI-III is composed of 175 statements and individuals completing the test must indicate whether they think these statements are true or false for them. Examples of these statements are: "I think I am a very sociable and outgoing person" and "I often allow others to make important decisions for me." Due to the fact that the Portuguese language has gender-specific words, the development of gender-specific forms was deemed appropriate for use in the present study (masculine and feminine forms).

***2) AUDIT.*** The AUDIT is a screening instrument specifically used for the detection of mild to severe drinking problems. This instrument is a questionnaire containing 10 items related to alcohol consumption patterns, in which respondents are asked to select their answers from specified categories.

***3) Diagnostic Questionnaire.*** This instrument is a symptom checklist for diagnosing substance abuse and dependence according to the DSM-IV-TR. This instrument contains 11 yes-no questions, each corresponding to a specific diagnostic criterion listed under the DSM-IV-TR diagnostic code. Separate forms for alcohol and drug abuse/dependence are available.

***4) Demographic Questionnaire.*** This questionnaire will gather general information about the subjects' age, gender, educational level, history of alcohol problems and drug abuse, history of substance abuse treatment, and admitting ICD-10 diagnosis (for participants receiving treatment at the Pater-Aldeia Clinic or Santa Casa de Misericordia Hospital).

All participants (clinical and non-clinical) will be administered all instruments and are expected to complete the assessment packet approximately within 30 to 40 minutes. They should be administered the assessment materials in counterbalanced order to control for possible order effects. Approximately half of the total sample should complete the assessment measures in the following order: demographic questionnaire, BP-MCMI-III, AUDIT, and diagnostic questionnaire (assessment packet with green face-sheet and odd identification number). The other half should complete the assessment measures in the

following order: demographic questionnaire, AUDIT, diagnostic questionnaire, and BP-MCMI-III (assessment packet with pink face-sheet and even identification number).

## B. Self-Report Measures

All assessment instruments used in this study rely on respondent self-report. They were developed for use with adults (18 years-old and above) who know how to read and write. Preferably, subjects should have a minimum of 8$^{th}$ grade education.

Self-report measures are most reliable when respondents have at least average intelligence, have no difficulty understanding the items, know themselves well enough to answer the questions accurately, and are willing to share what they know openly and nondefensively (Choca and Van Denburg, 1997). If during administration the examiner has reason to suspect that a particular subject is answering the questions in a way that would render the results unreliable, the answer sheets produced by this subject should be marked with a question mark sign (?) at the top left corner, for later identification of potentially unreliable protocols. The examiner should also write a brief explanation of why he/she believes the protocol may be invalid.

Some respondents may find the MCMI-III questions strange or feel uncomfortable answering them. They may become self-conscious, thinking that the examiner may consider them "crazy" if they were asked to participate or that the test does not apply to them. In those situations the examiner should explain to the respondent that the test assesses many different types of personality and emotional difficulties people have and that it would be unlikely that respondents would identify themselves with all items. The examiner should then encourage the respondents to continue completing the assessment measures, reminding them of the confidentiality nature of their answers and the important contribution they are making to the study.

The self-report measures are not difficult to answer but require that respondents be able to think clearly about their typical behaviors and their subjective experience. If respondents are feeling rushed or for any reason unable to concentrate while answering the test, their answers may be unreliable. To reduce the possibility of this happening, the assessment materials should be administered in a quiet, private, and well-lit room. Group administrations (more than one person answering the assessment materials at the same time and in the same room) are allowed and considered private if the respondents are answering the questions on their own, with no one looking over their shoulders or giving them opinions about how they should answer a particular question. Even if respondents say that they have nothing to hide from their partners, family members, or friends, the examiner must insist that the assessment materials be completed without anyone's help or interference. The examiner should then tell the respondents that, after they complete the assessment materials, they are free to share the experience with anyone they chose to do so.

## III. Data Collection Sites

### A. Clinical Sample

Clinical subjects will be recruited through two substance abuse treatment facilities in Brazil – the Pater-Aldeia Clinic and the Primeira Clínica Popular do Estado do Rio de Janeiro. Contact with the program directors of these institutions was made by the primary investigator, Cristina Magalhaes, and a written authorization for data collection was obtained. Contact information for the substance abuse treatment facilities involved in this study:

Renato Mussi
Clinica Pater-Aldeia
E-mail: rmussi@nitnet.com.br

Elen Fontes
Primeira Clínica Popular do Estado do Rio de Janeiro
E-mail: elenfontes@hotmail.com

### B. Non-Clinical Sample

Non-clinical subjects will be recruited through two churches in Brazil – the Igreja Evangélica Congregacional and the Igreja Presbiteriana Betânia in Rio de Janeiro. Contact with the leaders in charge of these congregations was made by the primary investigator, Cristina Magalhaes, and a written authorization for data collection was obtained. Contact information for the churches involved in this study:

Rev. Marcos Moura
Igreja Evangélica Congregacional
E-mail: mamoura@minasgas.com.br

Rev. Reginaldo Launé
Igreja Presbiteriana Betânia
E-mail: revregi@hotmail.com

## IV. Selection of Participants

### A. Clinical Sample

Clinical participants should be selected based on the following criteria: (1) subject's willingness to participate; (2) being above eighteen years of age; and (3) being in inpatient or outpatient treatment for alcohol/drug abuse or dependence. The clinical sample should include a minimum of 50 subjects with a diagnosis of alcohol abuse or dependence and 50 subjects with a diagnosis of drug abuse or dependence.

### B. Non-Clinical Sample

Non-clinical participants should be selected based on the following criteria: (1) subject's willingness to participate; (2) being above eighteen years of age; and (3) having no history of substance abuse treatment. The non-clinical sample should include a minimum of 50 subjects.

## IV. Examiners

The examiners are:

1. Monica Schaly
2. Vanda Guimarães
3. Elaine Guimarães
4. Vanete Ferreira
5. Rachel Ferreira

Monica Schaly is the research associate in charge of data collection in Brazil. She has a Masters degree in mental health counseling from Florida Atlantic University and is a licensed mental health counselor by the Florida Department of Health, with over 10 years of clinical experience. She was provided with research protocol and was fully trained by the primary investigator, Cristina Magalhaes, on all procedures for data collection.

In addition to administering the assessment materials to the participants, Ms. Schaly is responsible for overseeing the implementation of the data collection procedures, supervising the research assistants, and ensuring consistency of instrument administration across examiners. The research assistants – Vanda Guimarães, Elaine Guimarães, Vanete Ferreira and Rachel Ferreira – were also directly trained by the principal investigator and will assist Ms. Schaly in all aspects of data collection.

The primary investigator and the examiners will hold a phone meeting once weekly to go over any problems they may encounter during the previous week and decide on procedure modifications if necessary.

## V. The Role of the Examiner

**A.** **Recruitment:** The examiner is responsible for explaining the purpose of the study to potential participants and to obtain their voluntary consent in collaborating with the project. The examiner is also responsible for explaining all procedures involved, including the risks and benefits associated with their participation, and their right to withdraw from the study at any time. The examiner should assure potential participants that their answers will be kept confidential and those who agree to participate will be asked to sign an Informed Consent Form. Before asking participants to sign, they should be given time to read the Informed Consent Form (or it should be read to them).

**B.** **Scheduling**: Participants can complete the assessment materials immediately after they agree to participate in the study (after recruitment) or schedule an appointment to meet with the examiner at a later time or date - whichever will be more convenient for the participant and less disruptive of the site's regular routine. The examiner is then responsible for discussing scheduling options with the participant and arriving at a decision of when it would be the best time to administer the assessment measures, based on the examiner's availability and room availability.

**C.** **Administration**: The examiner is responsible for providing the participants with an *appropriate testing environment* and the materials required for the completion of the test, which include 2 sharpened black-lead pencils, an eraser, and all testing forms contained in the assessment packet. For the purposes of this study, an *appropriate testing environment* is defined as a quiet, private, and well-lit room, with a table and a chair, or a chair with an attached writing surface, where the respondent can comfortably complete the testing materials. The examiner is also responsible for administering the different assessment instruments in the appropriate order (counterbalanced*). The examiner should instruct the participants on how to appropriately answer each instrument, by answering the first 1 or 2 items of each measure with them to ensure that the instructions have been understood. The examiner should let the participants know that he/she is available to answer any questions during the assessment procedure and encourage them to answer all items. In addition, the examiner is responsible for observing the participants during the test administration and noting any behavior that may indicate that they are completing the assessment packet in an unreliable manner. If during administration of the instruments the examiner has reason to suspect that a particular subject is answering the questions in a way that would render the results unreliable, the answer sheets produced by this subject should be marked with a question mark sign (?) at the top left corner, for later identification of potentially unreliable protocols. The examiner should also write a brief explanation of why he/she believes the protocol may be invalid. Before the full administration is complete, the examiner should obtain the ICD-10 diagnosis from

the participants' medical file (for those participants that are receiving treatment for substance abuse) and ask them to record it on the Demographic Questionnaire.

**D.** **Post-Administration**: After the participants complete all instruments the examiner should ask them to go over their own completed forms to see if they missed answering any items. One issue that may come up during the administration of the MCMI-III is the participants' difficulty in deciding whether an item is true or false for them. Some may object to statements with the words *always* or *never* in them; and others may agree with parts of a statement while disagreeing with the rest. In such cases, the examiner should agree with the participant but encourage him or her to decide whether the statement is mostly true or false. The examiner should maintain the position that it is important that all items be answered, but if for any reason a participant refuses to answer an item, the examiner should say to the participant "it is OK not to answer this item if you don't want to," thank the person for participating in the study, and write the word "refused" next to the unanswered item. The examiner should make sure all forms completed by the same participant contain the same identification number and are stapled together to facilitate data entry. Signed Informed Consent Forms should be kept separate from completed assessment packets.