

Anger Management Profile (AMP): An Inventory of Scientific Findings

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PREFACE

Anger Management Profile (AMP) research and development began in 1980 and continues today. The proprietary AMP database ensures continued research and development. The AMP is a brief, easily administered and automated (computer scored) test that is designed for adult anger assessment. It includes 123 true/false and multiple choice items and can be completed in 30 minutes. The AMP contains five empirically-based scales: Truthfulness, Alcohol, Drugs, Anger and Anger Management. The AMP has been standardized on several others.

The AMP report explains the client's attained scale scores and makes specific intervention and treatment recommendations. It also presents Truth-Corrected scores, significant items, a concise structured interview and much more. The AMP has demonstrated reliability, validity and accuracy. It correlates impressively with both experienced staff judgment and other well-established tests. This document summarizes the majority of the AMP research.

AMP tests can be administered directly on the computer screen or in paper-pencil test booklet format. All tests are computer scored on-site. AMP reports are available within three minutes of test completion. AMP test data can be entered using an AMP diskette or flash drive or test users can login online and enter test data directly to the encrypted AMP database. The AMP is also offered with Human Voice Audio for the reading impaired; this presentation lets the respondent view the test items on the computer screen with accompanying auditory presentation.

The AMP is to be used in conjunction with a review of available records and respondent interview. No decision or diagnosis should be based solely on AMP results. Ongoing AMP research is ensures that assessment results remain reliable, valid and accurate.

INTRODUCTION

ANGER MANAGEMENT PROFILE (AMP)

Anger can range from mild annoyance to full-blown rage. Anger is a normal human emotion, but chronic uncontrolled anger problems have a significant detrimental effect on interpersonal relationships, work and on general quality of life. Clients that have trouble controlling anger are susceptible to road rage and other impulsive outbursts, and some may find themselves in legal trouble stemming from an anger-related incident. Some schools of thought view unmanaged anger as a type of uncontrolled compulsion; hence the popularity of a twelve-step approach to dealing with anger problems used by some anger support groups. As with substance abuse, it is helpful to assess anger in terms of degree of severity, with quantitative measures substantiating intervention and treatment.

Understanding anger requires comprehensive, multidimensional assessment. The AMP identifies anger and measures its severity but also assesses contributing factors to anger – alcohol, drugs and anger management. Substance use disorders and poor anger management abilities can put anger-prone individuals at greater risk for uncontrolled, impulsive or reckless angry episodes. The Alcohol Scale, Drugs Scale and Anger Management Scale are included in the AMP to measure these exacerbating factors that can aggravate anger problems.

The Anger Management Profile (AMP) was developed to help meet anger screening needs. The AMP is designed for high school age to adult anger assessment. The AMP is particularly useful in outpatient anger treatment programs, court-related assessments, diversion programs and probation departments. In these reports quantitative information is obtained by empirically based measures (scales) which independently generate risk (percentile) scores. Scale development is based upon nearly 20 years of research. In addition, explanatory paragraphs describe attained scores and contain specific score-related recommendations. Each scale is presented graphically within the AMP report.

ANGER MANAGEMENT PROFILE MEASURES OR SCALES

1. Truthfulness Scale
2. Anger Scale
3. Alcohol Scale
4. Drugs Scale
5. Anger Management Scale

The AMP represents the latest developments in psychometric techniques and computerized technology. The AMP can be administered on a computer screen or by using a paper-pencil test booklet method. Regardless of how the AMP is administered, all tests are computer-scored.

The AMP requires approximately 30 minutes for completion and is appropriate for high school ages through adulthood. The AMP is composed of True-False and multiple-choice items. It can be administered individually or in groups. The language and tone are direct, non-offensive and uncomplicated. Automated scoring and interpretive procedures help insure objectivity and accuracy. The AMP is to be used in conjunction with a review of available records, a focused interview and experienced staff judgment.

The AMP was designed to provide carefully developed measures (called scales) of several behavioral patterns and traits of interest to those working with substance abusers. The measures (scales) included in the AMP facilitate understanding client anger. In addition, they provide important information on the client's test taking attitude, emotional/behavioral adjustment, and much more.

UNIQUE FEATURES

Truth Correction: A sophisticated psychometric technique permitted by computerized technology involves "truth-corrected" scores which are calculated individually for each AMP scale. Since it would be naive to assume that everybody responds truthfully while completing any self-report test, the Truthfulness Scale was developed. **The Truthfulness Scale establishes how forthcoming or truthful a respondent is while completing the AMP.** Correlations between the Truthfulness Scale and all other scales permit identification of error variance associated with untruthfulness. This error variance can then be added back into scale scores, resulting in more accurate "Truth-Corrected" scores. Unidentified denial or untruthfulness produces inaccurate and distorted results. Raw scores may only reflect what the client wants you to know. Truth-Corrected scores can reveal what the client is trying to hide. Truth-Corrected scores are more accurate than raw scores.

Risk Range Percentile Scores: Each AMP scale is scored independently of the other scales. AMP scale scoring equations combine client pattern of responding to scale items, Truthfulness Scale and prior history that is contained on the AMP answer sheet. The Truthfulness Scale applies a truth-correction factor so that each scale score is referred to as a Truth-Corrected scale score. These Truth-Corrected scale scores are converted to the percentile scores that are reported in the client AMP report.

AMP scale percentile scores represent "degree of severity." Degree of severity is defined as follows: **Low Risk** (zero to 39th percentile), **Medium Risk** (40th to 69th percentile), **Problem Risk** (70th to 89th percentile), and **Severe Problem or Maximum Risk** (90th to 100th percentile). Severe problems include dependency.

Standardization data is statistically analyzed where percentile scale scores are derived from obtained scale scores from offender populations. The cumulative distributions of truth-corrected scale scores determine the cut-off scores for each of the four risk range categories. Individual scale score calculations are automatically performed and results are presented in the AMP report numerically (percentile), by attained risk category (narrative) and graphically (AMP report).

AMP Database: Every time an AMP is scored the test data is automatically stored on the diskette or flash drive, or if testing online, in the AMP database. Data from returned diskettes or flash drives are retrieved then saved in the AMP database. This applies to AMP diskettes or flash drives used anywhere in the United States and Canada. When the preset number of tests are administered (or used up) on an AMP diskette or flash drive, it is returned for replacement and the test data contained on these used diskettes or flash drives is input, in a confidential (no names) manner, into the AMP database for future analysis. Tests administered online are also stored in the AMP database. This database is statistically analyzed annually, at which time the AMP diskettes/flash drives or online tests are adjusted to reflect demographic changes or trends that might have occurred. The unique and proprietary AMP database also enables the formulation of annual summary reports that are descriptive of the populations tested. Summary reports provide important testing information for program budgeting, planning and management.

Confidentiality: Many agencies and programs are rightfully concerned about protecting their client's confidentiality. The proprietary Delete Client Names option is provided to allow deletion of client names from test diskette or flash drives or the online database prior to their being returned. This is optional and once the names have been deleted they are gone and cannot be retrieved. Deleting client names does not delete demographic information or test data. It only deletes the client names when the option is used. The option is available at any time and can be used whether the diskette or flash drive is full or not. Any identifying information (name, ID numbers, etc.) is encrypted prior to being stored in the AMP database. A secure algorithm built into the DII software unencrypts this information before displaying it to you. This ensures that only you can access the data and reports for your clients. This name deletion and data encryption procedures are compliant with HIPAA federal regulation 45 C.F.R. 164.501.

DESCRIPTION OF EMPIRICALLY BASED MEASURES OR SCALES

AMP scales were developed from large item pools. Initial item selection was a rational process based on clearly understood definitions of each scale. Subsequently, items and scales were analyzed for final test selection. The original pool of potential test items was analyzed and the items with the best statistical properties were retained. **Final test and item selection was based on each item's statistical properties.** It is important that users of the AMP familiarize themselves with the definition of each scale. For that purpose a description of each AMP scale follows.

Truthfulness Scale: This scale is a measure of the truthfulness of the client while completing the AMP. Obtained scores are categorized in terms of percentiles and risk levels - Low Risk, Medium Risk, Problem Risk, and Severe Problem (Maximum) Risk.

All interview and self-report information is subject to the dangers of untrue answers due to defensiveness, guardedness or deliberate falsification. The straightforward nature of any self-report questionnaire may appear to some people as intrusive -- giving rise to denial, faking or distortion. The Truthfulness Scale identifies these self-protective, recalcitrant and guarded respondents. It is equally important to establish that the client understood the test instructions and the items he or she was responding to, and the Truthfulness Scale also helps identify the reading impaired.

The Truthfulness Scale goes beyond establishing the truthfulness of the client. The correlation between the Truthfulness Scale and each other scale has been established, error variance associated with untruthfulness has been identified, and this error variance measure is added back into "truth-corrected" scale scores. **Truth-corrected scale scores are more accurate than raw scores.** A high Truthfulness Scale score (at or above the 90th percentile) invalidates all scale scores.

Alcohol Scale: This empirically based scale is a measure of a person having alcohol related problems. Obtained scores are categorized in terms of percentiles and risk levels (i.e., Low Risk, Medium Risk, Problem Risk and Severe Problem (Maximum) Risk). An elevated score at or above the 90th percentile identifies dependency and severe problems.

Alcoholism is a significant problem in our society. Woolfolk and Richardson note in their book, *Stress, Sanity and Survival*, that alcoholism costs industry over \$15.6 billion annually due to absenteeism and medical expenses. And over two decades later these costs have increased substantially. The harm

associated with alcohol abuse -- mental, emotional, and physical -- is well documented. The costs associated with alcohol-related problems are staggering.

Alcoholism has been empirically related to arrest records, hospitalizations, illicit substance (drugs) abuse, emotional problems, poor driving records and stress. Those working with alcohol abusers are aware of their job performance problems, impaired interpersonal relationships and poor Anger Management.

Many people have been exposed to alcohol in our society. Frequency and magnitude of alcohol use or severity of abuse are important factors. It is important to assess or measure the degree of severity of alcohol abuse, including dependency. This is done with the Alcohol Scale.

Drug Scale: This empirically based scale is a measure of drug-related problems. Obtained scores are categorized in terms of percentiles and risk levels - Low Risk, Medium Risk, Problem Risk and Severe Problem (Maximum Risk).

A drug may be broadly defined as any chemical substance that affects living processes. This definition includes alcohol as well as marijuana, cocaine, crack, ice, heroin, opium, amphetamines, barbiturates, LSD, etc. An important distinction between these substances is legality. The major licit (or legal) drugs are caffeine, nicotine and alcohol. They are generally socially approved and legally marketed substances.

Increased public awareness of illicit (or illegal) substance use and abuse as well as its effects is a growing concern. Since both licit and illicit substances, as discussed herein, are defined as "drugs," correlations between alcohol and drug abuse measures have been shown to exist. To discriminate between these groups in the AMP, the licit versus illicit dichotomy is emphasized.

It is apparent that many people have been exposed to drugs in our society. Frequency and magnitude of drug use or abuse are important factors. It is important to assess or measure the degree of severity of drug abuse including dependency. This is done with the Drug Scale.

Anger Scale: This empirically based scale is a measure of inappropriate or uncontrolled anger. Obtained scores are categorized in terms of percentiles and risk levels (i.e., Low Risk, Medium Risk, Problem Risk and Severe Problem (Maximum Risk)).

Studies such as those conducted at the University of Michigan indicate that drivers can be classified on a risk potential index as safe drivers or high risk drivers by monitoring inappropriate driving behavior such as moving violations, arrests, etc. Mortimer, et al. (1971)¹ concluded that alcohol abusers were significantly more involved in such offenses. Selzer (1971)² concluded in his research that for maximal screening effectiveness, test results and arrest records be used jointly. More recently (1984), the National Council on Alcoholism pointed out that "research results indicated driver's potential for risk-taking behavior may exist independently of his or her use of alcohol, and manifest itself as, angry irresponsibility." Continuing (NCA Newsletter, 1984), "positive correlations were found between high-risk groups and a number of other enforcement-related variables. Among these are non-traffic related drinking offenses, violent crimes, social, and fraudulent offenses, non-violent crimes, larceny, etc."

These studies emphasize the importance of a multi-dimensional approach to assessing anger-related problems. A person's anger (e.g., acting out potential) may be related to substance abuse, overall

adjustment, emotional problems, traits such as aggressiveness or risk-taking, and anger management. With these relationships in mind, it is important to explore these areas of inquiry to better understand the substance (alcohol and other drugs) abuser. This is done with the Anger Scale.

Anger Management Scale: This empirically based scale is a measure of a person's experienced anger level in comparison to that person's ability to cope with anger. Obtained scores are categorized in terms of percentiles and risk levels (i.e., Low Risk, Medium Risk, Problem Risk and Severe Problem (Maximum) Risk).

How effectively individuals cope with anger determines whether or not anger is a significant factor in their lives. Two concepts, anger and management abilities dominate the literature on anger. The better an individual's coping skills, compared to their amount of experienced anger, the higher the Anger Management Scale score. In contrast, if an individual is experiencing more anger than he or she can cope with, the lower the Anger Management Scale score. **In the AMP profile, Anger Management Scale scores were inverted to conform to the established risk levels ranging from low to high risk categories.**

Anger can exacerbate other symptoms of emotional, attitudinal, interpersonal and substance abuse related problems. Frequency and magnitude of impaired Anger Management are important factors in understanding the substance abuser. **An Anger Management Scale score at or above the 90th percentile is typically indicative of a severe anger management problem.** It is important to assess or measure the degree of severity of anger management problems. This is done with the Anger Management Scale.

AMP items are personal. The straightforward nature of any self-report questionnaire may appear to some people as invasive. Although perhaps uncomfortable to some, such criticism is directly related to the strength of the Anger Management Profile in objectively assessing anger and related problems. Information deemed personal by some is necessary in an empirical (as opposed to rational) approach to assessment.

RESEARCH STUDIES

AMP validation studies were conducted with established Minnesota Multiphasic Personality Inventory (MMPI) scales as well as Polygraph examinations and other reports. Reliability and validity studies have been conducted on substance abuse inpatients, outpatients, college students, job applicants, defendants, diversion program attendees, probationers, inmates and counseling patients.

Empirically based AMP scales (or measures) were developed by statistically relating scale item configurations to known substance (alcohol and other drugs) abuse groups. The AMP was then normed against an identified substance abuse population. A summary of much of this AMP research follows.

This document first presents the earlier studies that investigated the Anger Management Scale. Validation studies are presented next followed by reliability studies. Within the validity and reliability sections, the research represented in this document is reported chronologically -- as it occurred. Chronological presentation enables the reader to follow the evolution of the AMP into a state-of-the-art assessment instrument. More recent studies (toward the end of this document) are most representative of current AMP statistics.

AMP risk level classification categories are presented below. These percentages are based on AMP respondent scale scores. This permits comparison of predicted percentages with obtained percentages for each risk range category.

PREDICTED RISK RANGE PERCENTAGES FOR EACH AMP SCALE		
RISK CATEGORY	RISK RANGE	PREDICTED PERCENTAGE
Low Risk	zero to 39th percentile	39%
Medium Risk	40 to 69th percentile	30%
Problem Risk	70 to 89th percentile	20%
Severe Problem	90 to 100th percentile	11%

Predicted percentages for each scales risk range category can be compared to actually attained percentile scores. This comparison helps understand the accuracy of the AMP.

¹Mortimer, R.G., Filkins, L.D., and Lower, J.S. 1971 Court Procedures for identifying problem drinkers: Phase 11 (U.S. Department of Transportation, Report No. HSRI 71-120, HUF-1 1) Ann Arbor, Michigan: University of Michigan Highway Safety Research Institute.

²Selzer, M.L. 1971. Differential risk among alcohol abuser drivers. Proceedings of the American Association for Automotive Medicine 14: 107-213.

AMP VALIDATION RESEARCH

AMP research is reported in a chronological format, reporting studies as they occurred. This gives the reader the opportunity to see how the AMP evolved into a state-of-the-art risk and needs assessment instrument. For current information refer to the more recent studies near the end of this research section.

Initially, a large item pool was rationally developed for AMP scale consideration. Consensual agreement among three Ph.D. level psychologists and other experienced chemical dependency counselors familiar with AMP scale definitions reduced the initial item pool markedly. Final item selection was empirical - comparing statistically related item configurations to known substance abuse groups. Items chosen had acceptable inter-item reliability coefficients and correlated highest with their respective scales. Final item selection was based on each item's statistical properties. The AMP was then objectively standardized and normed on substance abuse populations.

1. Validation of the AMP Truthfulness Scale

The Truthfulness Scale in the AMP is an important psychometric scale as these scores establish how truthful the respondent was while completing the AMP. Truthfulness Scale scores determine whether or not AMP profiles are accurate and are integral to the calculation of Truth-Corrected AMP scale scores.

The Truthfulness Scale identifies respondents who were self-protective, recalcitrant and guarded, as well as those who minimized or even concealed information while completing the test. Truthfulness Scale items are designed to detect respondents who try to fake good or put themselves into a favorable light. These scale items are statements about oneself that most people would agree to. The following statement is an example of a Truthfulness Scale item, "Sometimes I worry about what others think or say about me."

This preliminary study was done to determine if these Truthfulness Scale items could differentiate between respondents who were honest from those trying to fake good. It was hypothesized that the group trying to fake good would score higher on the Truthfulness Scale than the group instructed to be honest.

Method

Seventy-eight Arizona State University college students (1985) enrolled in an introductory psychology class were randomly assigned to one of two groups. Group 1 comprised the "Honest" group and Group 2 comprised the "Fakers" group. Group 1 was instructed to be honest and truthful while completing the AMP. Group 2 was instructed to "fake good" while completing the AMP, but to respond "in such a manner that their faking good would not be detected." The AMP, which included the six AMP scales, was administered to the subjects and the Truthfulness Scale was embedded in the AMP as one of the six scales. Truthfulness Scale scores were made up of the number of deviant answers given to the 21 Truthfulness Scale items.

Results

The mean Truthfulness Scale score for the Honest group was 2.71 and the mean Truthfulness Scale score for Fakers was 15.77. The results of the correlation (product-moment correlation coefficient) between the Honest group and the Fakers showed that the Fakers scored significantly higher on the Truthfulness Scale than the Honest group ($r = 0.27, p < .05$).

The Truthfulness Scale successfully measured how truthful the respondents were while completing the AMP. The results of this study reveal that the Truthfulness Scale accurately detects those students who were faking from those students that took the AMP honestly.

2. Validation of the Five AMP Scales Using Criterion Measures

In general terms, a test is valid if it measures what it is supposed to measure. The process of confirming this statement is called validating a test. A common practice when validating a test is to compute a correlation between it and another (criterion) test that purports to measure the same thing and that has been previously validated. For the purpose of this study, the five AMP scales (Truthfulness, Anger, Alcohol, Drugs and Anger Management) were validated with comparable scales on the Minnesota Multiphasic Personality Inventory (MMPI). The MMPI was selected for this validity study because it is the most researched, validated and widely used objective personality test in the United States. The AMP scales were validated with MMPI scales as follows. The Truthfulness Scale was validated with the L Scale. The Alcohol Scale was validated with the MacAndrew Scale and Psychopathic Deviant. The Drug Scale was validated with the MacAndrew and Psychopathic Deviant. The Anger Scale was validated with the Taylor Manifest Anxiety and MacAndrew. The Anger Management Scale was validated with the Taylor Manifest Anxiety, Psychasthenia, Social Maladjustment and Social Alienation.

Method

One hundred (100) chemical dependency inpatients (1985) were administered both the AMP and the MMPI. Tests were counterbalanced for order effects -- half were given the AMP first and half the MMPI first.

Results and Discussion

Product-moment correlation coefficients were calculated between AMP scales and MMPI scales. These results are summarized in Table 1. The correlation results presented in Table 1 show that all AMP scales

significantly correlated (.001 level of significance) with all represented MMPI scales. In addition, all correlations were in predicted directions.

**Table 1. (1985) Product-moment correlations
between MMPI scales and AMP scales**

MMPI SCALES (MEASURES)	AMP SCALES (MEASURES)				
	Truthfulness	Alcohol	Drug	Anger	Anger Mgmt
L (Lie) Scale	0.72	-0.38	-0.41	-0.28	0.53
Psychopathic Deviant	-0.37	0.52	0.54	0.35	-0.59
Psychasthenia	-0.34	0.38	0.41	0.28	-0.68
Social Maladjustment	-0.25	0.34	0.26	0.18	-0.54
Authority Conflict	-0.43	0.31	0.47	0.37	-0.46
Manifest Hostility	-0.45	0.34	0.47	0.37	-0.58
Taylor Manifest Anxiety	-0.58	0.47	0.46	0.48	-0.78
MacAndrew	-0.40	0.58	0.62	0.44	-0.33
Social Alienation	-0.47	0.35	0.45	0.28	-0.67

NOTE: All correlations were significant at $p < .001$.

The **Truthfulness Scale** correlates significantly with all of the represented MMPI scales in Table 1. Of particular interest is this scale's highly significant positive correlation with the MMPI Lie (L) Scale. A high L Scale score on the MMPI invalidates other MMPI scale scores due to untruthfulness. This helps in understanding why the Truthfulness Scale is significantly, but negatively, correlated with the other represented MMPI scales. Similarly, the MMPI L Scale correlates significantly, but negatively, with the other AMP scales.

The **Alcohol Scale** correlates significantly with all represented MMPI scales. This is consistent with the conceptual definition of the Alcohol Scale and previous research that has found that alcohol abuse is associated with mental, emotional and physical problems. Of particular interest are the highly significant correlations with the MacAndrew ($r = 0.58$) Scale and the Psychopathic Deviant ($r = 0.52$) Scale. High MacAndrew and Psychopathic Deviant scorers on the MMPI are often found to be associated with substance abuse. Similarly, the **Drug Scale** correlates significantly with the MacAndrew ($r = 0.62$) Scale and the Psychopathic Deviant ($r = 0.54$) Scale.

The **Anger Scale** is most (highly) significantly correlated with the Taylor Manifest Anxiety (MAS, $r = 0.48$) and the MacAndrew Alcoholism ($r = 0.44$) scales. Mortimer, et al. (1971) concluded that alcohol abusers were significantly more likely to commit driving violations and behave angrily.

The **Anger Management Scale** is inversely related to MMPI scales which accounts for the negative correlations shown in Table 1. The positive correlation with the L scale on the MMPI was discussed earlier, i.e., Truthfulness Scale. It should be noted that anger exacerbates symptoms of impaired adjustment and even psychopathology. The Anger Management Scale correlates most significantly with the Taylor Manifest Anxiety ($r = -0.78$) Scale, the Psychasthenia ($r = -0.68$) Scale and the Social Alienation ($r = -0.67$) Scale.

These findings strongly support the validity of AMP scales. All of the AMP scales were highly correlated with the MMPI criterion scale they were tested against. The large correlation coefficients

support the validity of the AMP. All product-moment correlation coefficients testing the relation between AMP and MMPI scales were significant at the $p < .001$ level.

3. Relationships of Selected AMP Scales and Polygraph Examination

A measure that has often been used in business or industry for employee selection is the Polygraph examination. The polygraph exam is most often used to determine the truthfulness or honesty of an individual while being tested. The Polygraph examination is more accurate as the area of inquiry is more "situation" specific. Conversely, the less specific the area of inquiry, the less reliable the Polygraph examination becomes.

Three AMP scales were chosen for this study; Truthfulness Scale, Alcohol Scale and Drug Scale. The Truthfulness Scale was chosen because it is used in the AMP to measure the truthfulness or honesty of the respondent while completing the AMP. The Alcohol and Drug scales are well suited for comparison with the polygraph exam because of the situation specific nature of the scales. Alcohol and Drug scale items are direct and relate specifically to alcohol and drug use. The comparison with Truthfulness Scale is less direct because of the subtle nature of the Truthfulness Scale items as used in the AMP. The Truthfulness Scale is affected by the respondent's attitude, emotional stability and tendencies to fake good. It was expected that the Alcohol and Drug scales would be highly correlated with the polygraph results and the Truthfulness Scale would show a somewhat less but nonetheless significant correlation.

Method

One hundred and eighty-nine (189) job applicants (1985) were administered both the AMP and the Polygraph examination. Tests were given in a counterbalanced order, half of the applicants were given the AMP first and the other half of the applicants were administered the polygraph first. The subjects were administered the AMP and polygraph exam in the same room in the same session with the examiner present for both tests.

Results

The product-moment correlation results between the Polygraph exam and AMP scales indicated there was a significant positive correlation between the Truthfulness Scale and Polygraph exam ($r = 0.23$, $p < .001$). Similarly, significant positive relationships were observed between the Polygraph exam and the Alcohol Scale ($r = 0.54$, $p < .001$) and the Drug Scale ($r = 0.56$, $p < .001$).

In summary, this study supports the validity of the AMP. There were strong positive relationships between the selected AMP scales and the Polygraph examination. The highly significant product-moment correlation coefficients attained when AMP scales and Polygraph examinations were correlated demonstrates the validity of the AMP Truthfulness, Alcohol and Drugs measures.

These results are important because the Polygraph exam is a direct measure obtained from the individual being tested rather than a rating by someone else. This is similar to self-report such as utilized in the AMP. The fact that there was a very strong relationship between Polygraph results and AMP scales shows that this type of information can be obtained accurately in self-report instruments.

These results indicate that the AMP Truthfulness Scale is an accurate measure of the respondent's truthfulness or honesty while completing the AMP. The Truthfulness Scale is an essential measure in self-report instruments. There must be a means to determine the honesty or "correctness" of the respondents answers and there must be a means to adjust scores when the respondent is less than honest. The AMP Truthfulness Scale addresses both of these issues. The Truthfulness Scale measures truthfulness and then applies a correction to other scales based on the Truthfulness Scale score. The

Truthfulness Scale ensures accurate assessment. The results of this study show that the AMP is a valid assessment instrument.

4. Validation of the AMP in a Sample of Substance Abuse Inpatients

The AMP is an adult chemical dependency and substance (alcohol and other drugs) abuse assessment instrument. It is designed for use in intake-referral settings, inpatient and outpatient treatment programs, court-related assessments, diversion programs and probation departments. The AMP is a specific test designed for a specific population. The present study (1987) was conducted to validate the AMP in a sample of substance abuse inpatients in a chemical dependency facility.

Selected scales in the Minnesota Multiphasic Personality Inventory (MMPI) were used as criterion measures for the different AMP scales. The Truthfulness Scale was validated with MMPI L Scale, F Scale and K Scale. The Alcohol Scale was validated with MMPI MacAndrew Scale (MAC) and Psychopathic Deviate-Obvious (PD-O). The Drug Scale was validated with MMPI MacAndrew Scale and Psychopathic Deviate-Obvious. The Anger Scale was validated with MMPI Authority Problems (PD2), Psychopathic Deviate (PD), Manifest Hostility (HOS) and Resentment/Aggression (TSC-V). The Anger Management Scale was validated with MMPI Psychasthenia (PT), Anxiety (A), Taylor Manifest Anxiety (MAS) and Tension/Worry (TSC-VII). The MMPI scales were chosen to compare to the AMP scales because they measure similar attributes.

Method

The subjects used in the study were 212 substance (alcohol and other drugs) abuse inpatients in chemical dependency facilities. The AMP and MMPI were administered in counterbalanced order.

Results and Discussion

The product-moment correlation results are summarized in Table 2. Since this study is important in understanding AMP validity, each AMP scale is briefly summarized below. (N=212):

The **Truthfulness Scale** correlates significantly in predicted directions with selected MMPI criterion scales, L Scale (lie, $p < .001$), F Scale (validity, $p < .001$) and K Scale (validity correction, $p < .001$). Other significant correlations with traditional MMPI scales include: PD (Psychopathic deviate, $p < .001$), ES (Ego Strength, $p < .001$), and RE (Social responsibility, $p < .001$); Harris MMPI subscales: PD2 (Authority Problems, $p < .001$), PD4 (Social Alienation, $p < .001$), SCIA (Social Alienation, $p < .001$); Wiggins MMPI content scales: SOC (Social Maladjustment, $p < .001$), HOS (Manifest Hostility, $p < .001$); Wiener-Harmon MMPI subscales: PDO (Psychopathic Deviant-Obvious, $p < .001$); Tryon, Stein & Chu MMPI cluster scales: TSC-V (Resentment/Angry, $p < .001$).

The **Alcohol Scale** correlates significantly in predicted directions with selected MMPI criterion scales: MAC (MacAndrew scale, $p < .001$), and PD-O (Psychopathic Deviate Obvious, $p < .021$). The **Drug Scale** correlates significantly in predicted directions with selected MMPI criterion scales: MAC (MacAndrew scale, $p < .001$), and PD-O (Psychopathic Deviate Obvious, $p < .001$).

The **Anger Scale** correlates significantly in predicted directions with selected MMPI criterion scales: PD2 (Authority problems, $p < .003$), PD (Psychopathic Deviate, $p < .009$), HOS (Manifest Hostility, $p < .001$) and TSC-V (Resentment/Aggression, $p < .001$).

**Table 2. AMP-MMPI Product-moment Correlations (1987)
Inpatients, Chemical Dependency Facilities**

MMPI SCALES (MEASURES)	AMP SCALES (MEASURES)				
	Truthfulness	Alcohol	Drugs	Anger	Anger Mgmt
L	0.60	-0.24	-0.15	-0.13	-0.30
F	-0.34	0.32	0.32	0.31	0.49
K	0.39	-0.28	-0.29	-0.25	-0.51
MAC	-0.30	0.35	0.37	0.34	0.28
PD-O	-0.35	0.22	0.33	0.21	0.53
PD2	-0.26	0.18	0.17	0.20	0.07
PD	-0.33	0.21	0.33	0.18	0.39
HOS	-0.45	0.25	0.33	0.33	0.46
TSC-V	-0.46	0.34	0.28	0.28	0.58
ES	0.25	-0.27	-0.25	-0.21	-0.51
RE	0.41	-0.27	-0.34	-0.38	-0.45
SOC	-0.19	0.17	0.08	-0.03	0.39
PD4	-0.41	0.20	0.28	0.22	0.55
SCIA	-0.36	0.27	0.32	0.24	0.39
AUT	-0.21	0.20	0.30	0.34	0.18
TSC-III	-0.22	0.26	0.28	0.31	0.45
PT	-0.39	0.27	0.24	0.16	0.58
A	-0.41	0.31	0.31	0.26	0.68
MAS	-0.44	0.25	0.18	0.15	0.65
TSC-VII	-0.41	0.33	0.29	0.27	0.66

The **Anger Management Scale** correlates significantly in predicted directions with selected MMPI criterion scales: PT (Psychasthenia, $p < .001$), A (Anxiety, $p < .001$), MAS (Taylor Manifest Anxiety, $p < .001$), PD4 (Social Alienation, $p < .001$) and TSC-VII (Tension/Worry, $p < .001$).

These findings strongly support the validity of the AMP scales in this sample of chemical dependency inpatients. All of the AMP scales were highly correlated with the MMPI criterion scales they were tested against. The large correlation coefficients support the AMP as a valid instrument for assessment of substance abuse. Inpatients in chemical dependency facilities are known to have substance abuse problems and these correlation results confirm the validity of the instruments.

The AMP Alcohol and Drug scales are direct measures of alcohol and drug use and abuse, respectively, whereas the MacAndrew Scale was developed from discriminant analysis and does not include a truthfulness scale. The MacAndrew Scale items do not relate specifically to alcohol and drugs. Hence, the correlations between the MacAndrew Scale and the Alcohol and Drug scales could be affected by the lack of a truthfulness measure which is a deficiency of the MacAndrew Scale. However, the correlation coefficients were significant.

Where MMPI scales are closely related (by definition) to AMP scales the correlation coefficients were highly significant. For example, the AMP Truthfulness Scale and the MMPI L Scale both measure tendencies to fake good, and the correlation was very highly significant at $r = .60$. The correlation between Anger Management Scale and MMPI Tension/Worry Scale was $r = -.66$. This study supports the validity of the AMP.

5. Validation of the AMP Using the DRI as the Criterion Measure

A study was conducted in 1988 that was designed to examine relationships (correlations) between the Anger Management Profile (AMP) and the Driver Risk Inventory (DRI) on an inmate population of incarcerated DUI/DWI offenders. The DRI has been demonstrated to be a valid, reliable and accurate assessment instrument for evaluation of DUI or DWI offenders.

The AMP is designed for adult anger assessment. It contains five measures or scales: Truthfulness, Alcohol, Drugs, Anger and Anger Management. Five of these AMP scales are analogous (although independent) and directly comparable to Driver Risk Inventory (DRI) measures or scales. The DRI is designed for DWI (Driving While Intoxicated) and DUI (Driving Under the Influence) offender evaluation. The DRI contains five measures or scales: Truthfulness, Alcohol, Drug, Driver Risk and Stress Coping Abilities.

Although the scales designated Truthfulness, Alcohol, Drug, and Anger are independent and differ in the AMP and DRI, they were designed to measure similar behaviors or traits. Thus, although essentially composed of different test questions in the AMP and DRI test booklets, these comparable measures or scales do have similarity. The Anger Management Scale is the same in both AMP and DRI and each contains 40 test items. The Driver Risk Scale in the DRI was used as the criterion measure for the Anger Scale in the AMP.

Method

The AMP and DRI were administered in group settings to 154 DWI offender inmates, in counter balanced order, at Arizona State Department of Corrections (ADOC) facilities. All of the subject in this study were male inmates. The demographic composition was as follows. There were 98 Caucasians, 25 Hispanics, 13 American Indians, 12 Blacks and six other ethnicities. Five age categories were represented: 16-25 years (N = 26), 26-35 years (N = 74), 36-55 years (N = 38), 46-55 years (N = 11) and 56 or older (N = 5). Six educational levels were represented: Eighth grade or less (N = 7), Partially completed high school (N = 50), High school graduates (N = 70), Partially completed college (N = 16), College graduates (N = 9), and Professional/graduate school (N = 2). Each inmate completed both the AMP and the DRI. Although all inmates volunteered to participate in this study, inmate motivation varied.

Results and Discussion

The results of this study are presented in Table 3. The results demonstrate highly significant relationships between the analogues AMP and DRI scales. The DRI has been shown to be a valid measure of substance abuse in DUI/DWI offenders, hence, these correlation results support the validity of the AMP as a valid measure of substance abuse.

Table 3. Product-moment correlations 1988 study of DWI inmates (N = 154).

<u>All product-moment correlations are significant at p<.001.</u>	
<u>DRI versus</u>	<u>Agreement</u>
<u>AMP Scales</u>	<u>Coefficients</u>
Truthfulness Scale	.6405
Alcohol Scale	.3483
Drug Scale	.3383
Driver Risk (DRI) vs Anger (AMP)	.4070
Stress Coping Abilities vs Anger Mgmt (AMP)	.7642

It was noted that inmate motivation varied widely. This is evident in the Stress Coping Abilities correlation coefficient of .7642. Even though this is a highly significant correlation ($p < .001$), the Agreement Coefficient could be expected to be even higher because these were identical scales consisting of the same 40 items. It is reasonable to conclude that low motivation on the part of many inmate volunteers contributed to lower Agreement Coefficients. Inmate volunteers were serving DUI or DWI-related sentences and these tests had no bearing on their incarcerated status or sentences. However, in spite of widely varied inmate motivation, Agreement Coefficients for all five sets of scale comparisons were highly significant.

These results are important for another reason. This study extends the AMP normative (standardization sample) population to include inmates and incarcerated individuals who are serving their sentences in maximum security facilities. The validity of the AMP has been demonstrated on a sample of incarcerated substance abuse offenders.

6. Validation of the AMP in a Sample of Vocational Rehabilitation Clients

The Anger Management Profile (AMP) was investigated in a sample of individuals who are not generally associated with substance abuse but who have other disadvantages. The participants in the present study (1991) were Vocational Rehabilitation clients. These are individuals who have some form of handicap and require assistance in obtaining and maintaining employment.

Selected scales in the Minnesota Multiphasic Personality Inventory (MMPI) were used as criterion measures for the different Anger Management Profile (AMP) scales. Comparisons to previous validating studies which used substance abuse subjects will be made to determine the applicability of the AMP to various adult samples.

Method

The subjects used in the present study consisted of 74 Vocational Rehabilitation clients. The AMP and MMPI were administered in counterbalanced order. Product-moment correlations were calculated between AMP scales and selected criterion MMPI scales. The Truthfulness Scale was validated with the MMPI L Scale, F Scale and K Scale. The Alcohol Scale was validated with the MMPI MacAndrew Scale (MAC) and Psychopathic Deviate (PD). The Drug Scale was validated the MMPI MacAndrew Scale, Psychopathic Deviate. The Anger Scale was validated with the MMPI Resentment (TSC-V), Dominance (DO) and Manifest Hostility (HOS). The Anger Management Scale was validated with the MMPI Psychasthenia (PT), Taylor Manifest Anxiety (MAS) and Tension (TSC-VII).

Result and Discussion

There were 74 Vocational Rehabilitation clients used in the study. There were 49 males and 25 females. Age was distributed (frequency given in parentheses) as follows: 18 to 21 years (11), 22 to 25 years (7), 26-29 years (11), 30-33 years (14), 34-37 years (10), 42-45 years (9), 46-49 years (8), 50 or more years (4). Six education categories were represented: 8th grade or less (11), Partially completed High School (18), GED (14), High School Graduate (21), Some College (6), College Graduate (4). There were 47 Caucasians, 12 Blacks, 8 Hispanics, 6 American Indians and 1 other ethnicity. The correlation results are summarized in Table 4. For clarity, AMP scales are summarized individually and their MMPI scale correlations discussed.

**Table 4. Product-moment correlations.
Vocational Rehabilitation Clients (1991, N=74)**

<u>MMPI SCALES</u>	<u>AMP SCALES</u>				
	<u>Truthfulness</u>	<u>Alcohol</u>	<u>Drug</u>	<u>Anger</u>	<u>Anger Mgmt</u>
L	.493**	.001	-.141	-.012	-.105
F	-.344*	.435**	.334*	.529**	.440**
K	.344*	-.257	-.079	-.410**	-.308*
PD	-.109	.454**	.292*	.387**	.568**
MAC	-.177	.303*	.145	.369**	.168
DO	.193	-.438**	-.205	-.549**	-.511**
HOS	-.497**	.231	.136	.439**	.207
SOC	-.379**	.431**	.199	.223	.259
AUT	-.360**	.339**	.174	.374**	.204
PD2	-.293*	.381**	.263	.259	.209
SCIA	-.397**	.349*	.159	.414**	.390**
TSC-III	-.372**	.319**	.040	.421**	.254
TSC-V	.387**	.396**	.207	.531**	.435**
TSC-VII	.480**	.295*	.189	.413**	.441**
PT	-.135	.273*	.244	.216	.501**
MAS	-.245	.396**	.240	.426	.574**

Level of significance: * < .01, ** < .001

The **Truthfulness Scale** was significantly correlated with the MMPI scales that are associated with truthfulness measures. The AMP Truthfulness Scale was significantly correlated with the MMPI L Scale ($p < .001$), F scale ($p < .01$) and K scale ($p < .01$). When a person attains elevated L, F or K scales on the MMPI, other MMPI scale scores are invalidated. Similarly, an elevated Truthfulness Scale score on the AMP invalidates other AMP scale scores.

The **Alcohol Scale** was significantly correlated with the MMPI MacAndrew Scale ($p < .01$) and the PD scale (Psychopathic Deviate, $p < .001$). High MMPI PD and MAC scores are often associated with substance abuse.

The **Drug Scale** was significantly correlated with the PD Scale (Psychopathic Deviate, $p < .01$). The AMP Drug scale did not correlate significantly with the MMPI MacAndrew Scale. Substance (alcohol and other drugs) abusers have a close identity with their substance of choice. Without independent scales on the MacAndrew Scale for alcohol and drugs, many substance abusers would remain undetected. The low correlation between AMP Drug Scale and MacAndrew Scale may have been due to lying or faking on the MacAndrew Scale.

The **Anger Scale** was significantly correlated with the MMPI DO Scale (Dominance, $-.549$), TSC-V (Resentment, $.531$) and HOS (Manifest Hostility, $.439$). These correlations were significant at the $p < .001$ level of significance.

The **Anger Management Scale** correlates most significantly with the MMPI MAS (Taylor Manifest Anxiety, $r = .574$, $p < .001$), PT (Psychasthenia, $r = .501$, $p < .001$) and TSC-VII (Tension, $r = .568$, $p < .001$). These findings are consistent with earlier research.

These results are consistent with earlier research involving the administration of both the AMP and MMPI in that AMP scales are significantly correlated with criterion MMPI scales.

Comparisons between the present study and previous research that tested substance abusers (inpatient clients at chemical dependency facilities) shows some interesting results. As stated above, there was a somewhat lower correlation between the Truthfulness Scale and L Scale. There was a higher correlation between the Drug Scale and MacAndrew Scale in the substance abuser study and a lower correlation between the Alcohol Scale and Psychopathic Deviate Scale.

AMP RELIABILITY RESEARCH

Any approach to detection, assessment, or measurement must meet the criteria of reliability and validity. The research summarized above supports the validity of the AMP. Reliability research is summarized below.

Reliability refers to an instrument's consistency of results regardless of who uses it. This means that the outcome must be objective, verifiable, and reproducible. Ideally, the instrument or test must also be practical, economical, and accessible. Psychometric principles and computer technology insures accuracy, objectivity, practicality, cost-effectiveness and accessibility.

7. A Study of AMP Test-Retest Reliability

Reliability is a measure of the consistency of a test in obtaining similar results upon re-administration of the test. One measure of test reliability, over time, is the test-retest correlation coefficient. In this type of study, the test, is administered to a group and then the same test is re-administered to the same group at a later date.

Method

College students at two different colleges enrolled in introductory psychology classes participated in this study (1984). A total of 115 students participated and received class credit for their participation. The students were administered the AMP in a paper-pencil test format. One week later they were retested with the AMP again.

Results

The results of this study revealed a significant test-retest product-moment correlation coefficient of $r = 0.71$, $p < .01$. These results support the reliability of the AMP. Test-retest consistency was very high and indicates that the AMP scores are reproducible and reliable over a one week interval.

8. Inter-item Reliability of the AMP

Within-test reliability measures to what extent a test with multiple scales measuring different factors, measures each factor independent of the other factors (scales) in the test. It also measures to what extent items in each scale consistently measures the particular trait (or factor) that scale was designed to measure. Within-test reliability measures are referred to as inter-item reliability. The most common method of reporting within-test (scale) inter-item reliability is with Coefficient Alpha.

Method

This study (1985) included three separate groups of subjects: 100 outpatients in private practice, 100 substance abuse inpatients, and 189 job applicants -- totaling 389 subjects. Separate inter-item reliability analyses were conducted to compare results across the three groups.

Results and Discussion

The inter-item reliability coefficient alpha and within-test reliability statistics are presented in Tables 7 and 8, respectively. All inter-item reliability coefficient alphas and within-test reliability F-values are significant at $p < .001$. These results supports the reliability of the AMP. The AMP is a highly reliable instrument.

**Table 5. Inter-item reliability, coefficient alpha. (1985)
Outpatients, Substance Abuse Inpatients and Job Applicants (N = 389)**

AMP SCALES MEASURES	N ITEMS	Outpatients (N = 100)	Inpatients (N = 100)	Job Applicants (N = 189)
Truthfulness Scale	21	0.81	0.79	0.81
Alcohol Scale	21	0.86	0.93	0.83
Drug Scale	21	0.80	0.85	0.79
Anger Scale	21	0.63	0.72	0.50
Anger Mgmt	40	0.81	0.84	0.73

Table 6. Within-test reliability, F statistic.

All F statistics are significant at $p < .001$.

AMP SCALES MEASURES	N ITEMS	Outpatients (N = 100)	Inpatients (N = 100)	Job Applicants (N = 189)
Truthfulness Scale	21	21.73	53.15	45.91
Alcohol Scale	21	9.29	31.46	47.75
Drug Scale	21	27.19	16.34	58.18
Anger Scale	21	26.97	17.05	48.26
Anger Mgmt	40	46.74	16.20	195.86

These results (Table 5 and 6) demonstrate the impressive reliability of the AMP. Reliability was demonstrated with three different groups of people (outpatients, inpatients and job applicants) taking the AMP.

In each of these subject samples, all AMP scales (measures) were found to be significantly independent of the other AMP scales as shown by the highly significant within-test F statistics. The F statistic is obtained in within-subjects between measures ANOVA performed on each individual AMP scale in each of the samples.

The F statistics show that each AMP scale measures essentially one factor (or trait). In addition, all AMP scales show high inter-item reliability. This is demonstrated by the Standardized Cronbach's Coefficient Alpha - a widely used test of inter-item reliability when using parallel models. This measure reveals that all items in each AMP scale are significantly related and measure just one factor. In other words, each AMP scale measures one factor, yet the factor being measured is different from scale to scale.

The inter-item reliability coefficients show very similar results across the three subject samples. The Truthfulness Scale, Alcohol Scale and Drug Scale are in close agreement. The Anger Management Scale shows similar results for the chemical dependency groups but the job applicant group had a slightly lower coefficient alpha. This difference might be accounted for by the fact that individuals applying for a job would not want to show themselves in a bad light by indicating they have an emotional, stress-

related or mental health problem. The Anger Scale attained a somewhat lower coefficient alpha than the other AMP scales perhaps because these two scales are not as specific as, for example, alcohol or drug abuse.

Because each sample may have scored differently from the other two samples, the data for all subjects were combined. For example, job applicants may score low on the Alcohol Scale and inpatient clients may score high. By combining the data, scale scores would likely be distributed from low to high and result in even better coefficient alphas than each sample separately. Table 7 presents the inter-item reliability analysis of all of these independent studies (N = 100, N = 100, N = 189) combined (N = 389).

The combined data shows that all but one coefficient alpha increased in the combined data compared to coefficient alphas of each subject sample alone. Only the Anger Scale had a higher coefficient alpha in the inpatient chemical dependency clients than this scale coefficient alpha for the combined data. These coefficient alphas in the combined data are very high and provide strong support for the reliability of the AMP.

**Table 7. Inter-item reliability, coefficient alpha. All data combined (N = 389).
All F statistics are significant at p<.001.**

<u>AMP SCALES MEASURES</u>	<u>N ITEMS</u>	<u>COEFFICIENT ALPHA</u>	<u>F VALUE</u>
Truthfulness Scale	21	0.82	96.93
Alcohol Scale	21	0.94	26.68
Drugs Scale	21	0.88	79.71
Anger Scale	21	0.70	82.00
Anger Mgmt	40	0.85	150.78

9. Replication of AMP Reliability in a Sample of Inpatient Clients

In a replication of earlier AMP research, chemical dependency inpatients (1987) were used to evaluate the reliability of the AMP scales.

Method and Results

The AMP was administered to 192 inpatients in a chemical dependency facility. The inter-item coefficient alpha statistics are presented in Table 8. These results are in close agreement to reliability results obtained in an earlier study using chemical dependency inpatient clients. In some cases the coefficient alphas are higher in the present study as in the previous study. The results of the present study support the reliability of the AMP.

**Table 8. Inter-item reliability, coefficient alpha.
Chemical dependency inpatients (N = 192).**

<u>AMP SCALES MEASURES</u>	<u>N ITEMS</u>	<u>COEFFICIENT ALPHA</u>	<u>F VALUE</u>	<u>P VALUE P<</u>
Truthfulness Scale	21	0.79	13.28	0.001
Alcohol Scale	21	0.92	24.39	0.001
Drugs Scale	21	0.87	22.23	0.001
Anger Scale	21	0.81	10.32	0.001
Anger Mgmt	40	0.99	27.77	0.001

In each of the subject samples studied, the AMP scales were demonstrated to be independent measures. This mutual exclusivity (significant at $p < .001$) was demonstrated by a within-subjects measures ANOVA performed on each AMP scale. These analyses demonstrate that each AMP scale measures one factor or trait. All AMP scales demonstrate high inter-item congruency, as reflected in the standardized Cronbach's Alpha. The items on each AMP scale are significantly related to the factor or trait each scale was designed to measure. In other words, each AMP scale measures one factor, and the factor (or trait) being measured differs from scale to scale.

AMP scales (measures) have been shown to be both mutually exclusive and have high inter-item scale consistency. The AMP has acceptable and empirically demonstrated reliability. In addition, inter-item reliability studies have shown that each AMP scale is an independent measure of the trait (factor) it was designed to measure.

10. AMP Sex Differences in a Sample of Municipal Court Clients

A study (Arizona, 1990) involving substance abuse-related offenders processed through the Phoenix Municipal Court was conducted to evaluate possible sex differences in Anger Management Profile (AMP) scale scores. AMP scale reliabilities were also reviewed.

Methods and Results

The AMP was administered as part of the routine substance abuse evaluation program in Phoenix Municipal Court to 794 individuals. There were 727 (92%) males and 67 (8%) females included in this study. Age was distributed as follows: Under 16 years of age (1 male); 16-25 years of age (229 males, 28 females); 26-45 years (450 males, 29 females); 46-55 years (33 males, 6 females); and over 55 years (14 males, 4 females). Ethnic composition is summarized as follows: Caucasian (400 males, 71 females); Black (62 males, 14 females); Hispanic (151 males, 9 females); American Indian (59 males, 21 females); Asian (1 female); and other (5 males, 1 female). Education is summarized as follows: 8th grade or less (8 males, 1 female); Some High School (182 males, 36 females); GED (69 Males, 6 females); High School Graduates (216 males, 34 females); Some College (165 males, 34 females); Business/Technical School (8 males); College Graduates (27 males, 5 females); and Graduate/Professional Degree (2 males, 1 female).

The *t*-test comparisons of AMP scales between males and females indicated that there were no significant sex differences demonstrated on the Truthfulness Scale, Alcohol Scale, Drug Scale, Anger Scale or the Anger Management Scale. The seeming lack of a consistent pattern of sex differences on a state-by-state comparison emphasizes the importance of ongoing database research.

**Table 9. AMP reliability, coefficient alpha. Municipal court clients (N=794).
All coefficient alphas are significant at $p < .001$.**

AMP SCALES	Coefficient Alpha
Truthfulness Scale	.80
Alcohol Scale	.90
Drug Scale	.89
Anger Scale	.81
Anger Mgmt	.94

This study supports the reliability (internal consistency) of the Anger Management Profile (AMP). The coefficient alphas for all AMP scales were significant at $p < .001$. Similar reliability results have been demonstrated on other client populations.

11. Study of AMP on a Sample of 100 Low Risk Probationers

A pilot study (Arizona, 2008) involving one hundred low-risk probationers examined the accuracy, reliability, and validity of the AMP test.

Methods and Results

Participants in this study consisted of 100 probationers. There were 70 (70.0%) males and 30 (30.0%) females. Age was distributed as follows: Age: 20 & under (6.0%); 21-30 (35.0%); 31-40 (25.0%); 41-50 (22.0%); 51-60 (9.0%) and 61 & Over (3.0%). Ethnicity: Caucasian (54.0%); African American (8.0%), Hispanic (25.0%), Asian (1.0%), Native American (12.0%) and Other (0.0%). Education: Eighth grade or less (3.0%); Some H.S. (20.0%); H.S. graduate/G.E.D. (50.0%); Technical/Business school (1.0%); Some college (19.0%); College graduate (5.0%); and Advanced Degree (1.0%).

AMP Reliability

Test reliability refers to a scale's consistency of measurement. A scale is reliable if a person gets the same score when re-tested as he/she did when originally tested. Table 10 shows the reliability scores for each AMP scale. Perfect reliability is 1.00.

Table 10. AMP Reliability (N=100, 2008)

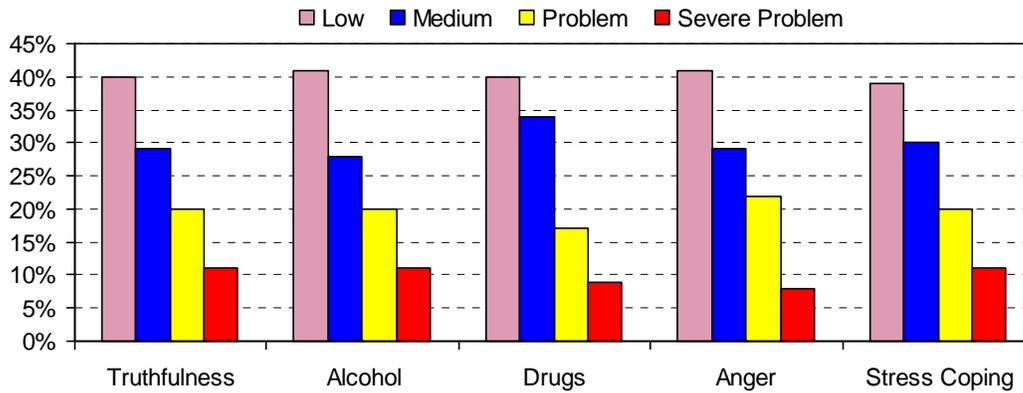
<u>Scale</u>	<u>Alpha</u>
Truthfulness Scale	.88
Alcohol Scale	.94
Drugs Scale	.93
Anger Scale	.89
Anger Management Scale	.96

As Table 10 illustrates, all AMP scales have a reliability of .88 or higher. The professionally accepted reliability standard is .75. All AMP scales exceed this standard and demonstrate very impressive reliability.

AMP Accuracy

Test accuracy is determined by examining how close attained scale scores are to predicted scores. Four categories of risk are assigned: Low Risk (zero to 39th percentile), Medium Risk (40 to 69th percentile), Problem Risk (70 to 89th percentile), and Severe Problem (90 to 100th percentile). The top row of Table 11 shows the percentages of probationers that were predicted to score within each risk range. (These predicted percentages for each AMP scale risk category were obtained from AMP standardization data.) The body of Table 11 presents actual attained risk category percentages. Differences between attained and predicted percentages are shown in bold in parentheses. For example, in terms of the Low Risk range for the Truthfulness Scale: 39% of offenders were predicted to score within this range; the attained percentage of offenders who scored in this range was 40%, which is a difference of one percentage point from what was predicted.

Table 11. AMP Accuracy (153 Items, N=100)



Scale	Low Risk (39%)	Medium Risk (30%)	Problem Risk (20%)	Severe Problem (11%)
Truthfulness	40.0 (1.0)	29.0 (1.0)	20.0 (0.0)	11.0 (0.0)
Alcohol	41.0 (2.0)	28.0 (2.0)	20.0 (0.0)	11.0 (0.0)
Drugs	40.0 (1.0)	34.0 (4.0)	17.0 (3.0)	9.0 (2.0)
Anger	41.0 (2.0)	29.0 (1.0)	22.0 (2.0)	8.0 (3.0)
Anger Mgmt	39.0 (0.0)	30.0 (0.0)	20.0 (0.0)	11.0 (0.0)

Twenty-four out of 25 attained risk range percentiles were within **3.0** points of the predicted percentages. (The one exception, the Drugs Scale- Medium Risk percentile, was within just 4.0 points of the predicted percentage.) The average difference between attained percentages and predicted percentages was only **1.3** points. These results strongly support the accuracy of the AMP as a probationer-assessment instrument.

AMP Validity

Validity refers to a test’s ability to measure what it is purported to measure. The quality of a test is largely determined by its validity.

Predictive validity refers to a test’s ability to predict observable “criterion” behaviors. In this analysis, our prediction criterion was whether or not probationers had been treated for alcohol and/or drug problems. It was expected that “treated” probationers would be identified by higher (70th percentile and above) scores on the Alcohol and/or Drugs scales. This analysis involved comparing scale scores of the treatment group with scale scores of the non-treatment group for each scale. It was predicted that the treatment group’s scores would be significantly higher than the non-treatment group’s scores. For the Alcohol Scale, scores for probationers that had been treated for alcohol problems were compared with scores for probationers who had not been treated for alcohol problems (average scores: 94.5 and 63.5, respectively). *T*-test results indicated that the difference in scores was statistically significant ($t(98) = 8.13, p < .001, d = 1.24$). For the Drugs Scale, a second analysis compared scores of probationers who had been treated for drug problems with probationers who had not been treated for drug problems (average scores: 66.3 and 45.1, respectively). Again, a *t*-test detected a statistically significant difference in scores ($t(98) = 4.23, p = .004, d = 0.87$) between the “treatment” and “non-treatment” group.

The highly significant scale score differences indicate that Alcohol and Drugs Scale scores differentiate between probationers that have been treated for alcohol and/or drugs problems and probationers that have not been treated. Scale scores effectively predict the criterion behavior “treatment”. A reasonable inference is that the AMP Alcohol and Drugs Scales accurately differentiate between probationers with substance abuse problems and those without substance abuse problems. These results support the predictive validity of the AMP.

Another analysis was performed for the Anger Scale. Two comparative groups- “angry” and “non-angry”- were established using “direct admissions”. The angry group made the self-admission that “they were very angry”, whereas the non-angry group did not. It was predicted that angry probationers would be identified by their notably high scores on the Anger Scale. Scale scores for the angry and non-angry groups were compared (average scores: 94.8 and 74.2, respectively). *T*-test results revealed that score differences were statistically significant ($t(98) = 6.36, p < .001, d = 1.03$).

These results indicate that Anger Scale scores differentiate between probationers that admit to being overly angry and those that do not. Scale scores effectively predict anger. This finding further corroborates the validity of the AMP.

21. AMP Test Statistics for a Small Sample of Anger Management Clients

This study (2010) examines AMP test statistics for 97 clients. Test data was gathered in the online AMP database between May 2010 and December 2010.

Method and Results

Included in this study (2010) were 97 anger management clients throughout the U.S. Nearly all (94.5%) were male; 5.5% were female. The demographic composition of this sample is as follows: Age: 19 and younger (16.4%); 20 through 29 (38.9%); 30 through 39 (25.4%); 40 through 49 (15.3%); 50 through 59 (3.5%); 60 and older (0.5%). Education: 8th grade or less (6.4%); Some High School (42.0%); High School Graduate (38.6%); Partially Completed College (10.8%); College Graduate (1.4%); Advanced Degree (0.8%). Ethnicity: Caucasian (47.6%); Black (45.6%); Hispanic (2.8%); Asian (0.1%); Native American (1.4%); Other (2.5%). Marital Status: Single (44.9%); Married (30.9%); Divorced (17.8%); Separated (5.2%); Widowed (1.2%).

A reliable test will result in similar scores for the initial test and re-tests. The most common reliability statistic is coefficient alpha. Coefficient alpha varies from 0.0 for random responding (or no reliability) to 1.0 for perfect reliability. AMP scale reliability is presented in Table 12.

Table 12. Reliability coefficient alphas (n=97, 2010).

All alphas are significant at $p < .001$

<u>AMP SCALES</u>	<u>Coefficient Alphas</u>
Truthfulness Scale	.86
Anger Scale	.94
Anger Management Scale	.95
Alcohol Scale	.96
Drugs Scale	.96

All AMP scales' alpha coefficients were considerably higher than .75, the professionally accepted reliability threshold. All Anger Management Profile scales demonstrate excellent reliability, attaining alphas at or above .86. Four of the five AMP scales had reliability coefficients of .94 and higher.

Table 13 (below) presents AMP accuracy analysis results, which involves comparison of client-attained scale scores against predicted scores for the four risk range categories used in the AMP. These risk range categories are Low Risk (0-39th percentile), Medium Risk (40-69th percentile), Problem Risk (70-89th percentile), and Severe Problem Risk (90-100th percentile). The different risk range categories facilitate placing clients into appropriate levels of intervention, treatment and supervision.

Table 13. AMP Risk Range Accuracy (N=97, 2010)

Scale	Low Risk (39%)		Medium Risk (30%)		Problem Risk (20%)		Severe Problem (11%)	
Truthfulness Scale	41.2	(2.2)	29.9	(0.1)	19.6	(0.4)	9.3	(0.7)
Anger Scale	40.2	(1.2)	26.8	(3.2)	21.6	(1.6)	11.4	(0.4)
Alcohol Scale	38.5	(0.5)	30.2	(0.2)	20.8	(0.8)	10.5	(0.5)
Drugs Scale	40.0	(1.0)	30.5	(0.5)	18.9	(1.1)	10.6	(0.4)
Anger Management Scale	39.4	(0.4)	30.9	(0.9)	19.1	(0.9)	10.6	(0.4)

The four risk ranges (Low, Medium, Problem and Severe) and the predicted percentages for each risk range category are shown in at the top row of Table 13. The percentages for each Anger Management Profile scale and risk range category were obtained from the cumulative distribution of clients scale scores. All attained risk range percentiles were within 3.2 points of the predicted percentages. The average difference between predicted and obtained percentages was 0.8 percentage points. This represents accurate assessment.

Correlations of client-reported court history such number of domestic violence arrests, number of assault arrests, etc. with AMP scales are presented in Table 14. These results demonstrate that client history is significantly associated with their AMP scale scores. It is important to note that clients with relatively few arrests can and do attain high AMP scale scores. These clients would be overlooked in regards to problem severity if court records alone were the only criteria used to determine client risk. In other words, court records alone are not adequate for predicting client risk.

Table 14. Correlation Coefficients: Client Court Histories with AMP Scale Scores (N=97, 2010)

	Truthfulness	Anger	Anger Mgmt	Alcohol	Drugs
DV arrests	-.148*	.462***	.278**	.215*	-.034
Assault arrests	-.065	.140*	.106*	-.003	.086
Alcohol arrests	-.078	.315**	.221*	.399***	.306**
Drug arrests	-.069	.136*	.095	.270**	.369**
Anger programs	-.190*	.210*	.164*	.041	.176*

*Small effect ($r =$ between .10 and .24); **Medium effect ($r =$ between .25 and .39); ***Large effect ($r \geq .40$)

The number of alcohol-related arrests correlates most strongly with the Alcohol Scale ($r=.399$). Number of drug arrests correlates most strongly with the Drugs Scale ($r=.369$). The AMP Alcohol Scale and Drugs Scale are significantly associated with the number of substance-related arrests.

Test validation procedures often involve examining correlations between the test being validated and another test or the criterion. The criterion variable (concurrent validity) is typically another test that measures the same construct. This type of validation has been conducted on AMP scales in earlier research presented previously within this document.

AMP discriminant validity analysis results are presented in Table 15. This procedure involves comparing AMP scale scores for two client groups. One group consists of clients that were arrested two or more times for domestic violence or assault offenses (multiple offenders), and the other group is made up of clients that were arrested no more than once (first offenders). Clients that have been arrested two or more times are expected to have more severe problems than clients with fewer arrests. Because AMP scales measure problem severity, it is expected the multiple offender group would score higher on AMP scales than the first offenders group. Mean AMP scale scores for the two offender groups are presented in Table 15.

For four of the five AMP scales, the average scores for multiple offenders were higher or more severe than first offenders' average scale scores. Higher scores indicate more acute problem severity. AMP scale scores effectively differentiated between offenders known to have more severe problems (multiple offenders) and first-time offenders. It should be noted that the Anger Management Scale scores are interpreted differently than other AMP scale scores. For this scale, higher scores represent better anger management skills. In this analysis, multiple offenders' average scores for the Anger Management Scale were significantly poorer than the average scores of first-time offenders. Multiple offenders' average scale scores for the Truthfulness Scale were significantly less severe (lower) than the average Truthfulness Scale scores of first offenders. This indicates that multiple offenders were slightly less prone to problem minimization or equivocation while completing the AMP than first offenders were.

Table 15. T-test comparisons between first offenders and multiple offenders. Offender status defined by number times arrested for assault or domestic violence. (2010, N=97)

AMP Scale	First Offenders Mean Scores	Multiple Offenders Mean Scores	T-value	Level of significance
Truthfulness Scale	8.99	5.93	2.15	p<.001
Alcohol Scale	12.56	27.73	-2.74	p<.001
Drugs Scale	10.86	16.60	-1.08	p<.001
Anger Scale	11.35	24.53	-5.18	p<.001
Anger Management Scale	117.57	80.93	2.42	p<.001

T-tests analyses were performed for all AMP scales to assess possible sex differences in the prison clients. Significant gender differences were demonstrated on the two focal AMP scales – the Anger Scale and the Anger Management Scale. This underscores the importance of standardizing anger assessments on both sexes. These results are presented in Table 16.

The average scores for the Truthfulness, Alcohol and Drugs scales were comparable for male and female offenders. Anger and Anger Management scale scores were significantly more problematic for male offenders than female offenders. Again, it should be noted that the Anger Management Scale scores are interpreted differently than other AMP scale scores. Higher scores on the Anger Management Scale represent more effective anger management skills. The significant gender difference in the average Anger and Anger Management scale scores indicates that male clients in this study had more severe anger-related problems and poorer stress management skills than females.

Table 16. Sex differences in the client sample (2010, N=97).

AMP SCALE	Mean Scale Score		T-value	Significance Level
	Males	Females		
Truthfulness Scale	8.38	8.90	-0.41	n.s.
Anger Scale	13.67	11.81	0.74	p<.001
Alcohol Scale	14.63	15.29	-0.13	n.s.
Drugs Scale	11.68	11.48	0.05	n.s.
Anger Management Scale	110.76	115.62	-0.36	p<.001

Conclusion

Anger Management Profile (AMP) scale scores are accurate. AMP scale scores identify clients with more severe problems. Correlation analysis between offender court history and AMP scale scores supports AMP validity. AMP test results are individualized and facilitate recommendations for intervention/treatment programs. The multiple scales and inclusion of court-related history in the AMP are well-suited for future studies on recidivism prediction.

SUMMARY

In conclusion, this document is not intended as an exhaustive compilation of AMP research. Yet, it does summarize many studies and statistics that support the reliability and validity of the AMP. Based on this research, the AMP presents an increasingly accurate picture of substance (alcohol and other drugs) abusers and the risk they represent. The AMP provides a sound empirical foundation for responsible decision making.

Summarized research demonstrates that the AMP is a reliable, valid and accurate instrument for client assessment. It is reasonable to conclude that the AMP does what it purports to do. The AMP acquires a vast amount of relevant information for staff review prior to decision making. Empirically based scales are objective and accurate. Assessment has shifted from subjective opinions to objective accountability.

The AMP is not a personality test, nor is it a clinical diagnostic instrument. Yet, it is much more than just another alcohol or drug test. The AMP is an adult risk and needs assessment instrument.

Areas for future research are many and complex. AMP research continues to evaluate age, gender, ethnicity, education, and urban vs. rural. Consistent with the foregoing, we encourage more research on demographic, cultural and environmental factors impacting on client adjustment, risk and need.

Parties interested in conducting AMP - related research should contact Professional Online Testing Solutions, Inc. Please include a research outline containing design methodology, contemplated statistical analysis and the anticipated completion date. Students must include their faculty advisors name, address and telephone number. Faculty advisors and/or research principles will be contacted prior to Professional Online Testing Solutions, Inc. decision regarding proceeding.