Adult Outpatient Assessment

AOA: An Inventory of Scientific Findings

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PREFACE

The **Adult Outpatient Assessment (AOA)** is evidence based self-report test that is designed for adult (male & female) outpatient screening or evaluation. It incorporates its evidence based Alcohol Scale and Drug Scale findings with the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) Substance Abuse and Substance Dependency classifications, along with self-esteem and violence measures.

The Adult Outpatient Assessment (AOA) consists of 153 questions and takes on average 25 to 30 minutes to complete. There are eight (8) AOA scales (measures or domains): **1.** Truthfulness Scale, **2.** Self-Esteem Scale, **3.** Alcohol Scale, **4.** Drug Scale, **5.** DSM-IV Substance Abuse, **6.** DSM-IV Substance Dependency, **7.** Violence Scale and **8.** Stress Management Scale.

INTRODUCTION
ADULT OUTPATIENT ASSESSMENT (AOA)

The Adult Outpatient Assessment (AOA) is an evidence-based test that is designed for adult (male and female) outpatient screening or assessment.
Psychiatrists, psychologists, private practitioners, counselors, and mental health professionals use the AOA to screen at intake. The AOA contains eight (8) scales (measures or domains): **1.** Truthfulness Scale, **2.** Self-Esteem Scale, **3.** Alcohol Scale, **4.** Drugs Scale, **5.** DSM-IV Substance Abuse Scale, **6.** DSM-IV Substance Dependency Scale, **7.** Violence Scale and **8.** Stress Management Scale.

www.online-testing.com is the AOA online or internet testing site. AOA tests are available 24/7. AOA is evidence based and has demonstrated reliability, validity and accuracy. AOA is HIPAA compliant. For more information our email address is info@online-testing.com.

In 2010, an estimated 22.1 million people were classified with substance dependence or substance abuse (8.7%). Of these, 2.9 million were classified with dependence or abuse of both alcohol and illicit drugs; 4.2 million had dependence or abuse of illicit drugs but not alcohol; 15 million had dependence or abuse of alcohol, but not illicit drugs (National Survey of Drug Use and Health [NSDUH, 2010]).

Public awareness of substance (alcohol and other drugs) abuse as a nationwide health problem has clarified the need for identification and treatment of these disorders. The Adult Outpatient Assessment (AOA) is focused entirely upon substance (alcohol & drugs) abuse and was specifically designed for substance abuse counseling and treatment screening, court related evaluations, and misdemeanor and felony assessments. The AOA should be used in conjunction with a review of available records and experienced staff judgment.

The AOA can be administered individually or in groups. The language is direct, non-offensive, and uncomplicated. Automated scoring and interpretive procedures help insure objectivity and accuracy. AOA reports are scored and printed onsite within 2½ minutes of data (answers) input.

UNIQUE FEATURES

The AOA has several unique features that set it apart from other alcohol and drug abuse assessment instruments. These features include: Truthfulness Scales, Risk Range Percentiles, AOA database, HIPPA Compliance, DSM-IV substance abuse/dependency classification scales, and compatibility with American Society of Addiction Medicine (ASAM) treatment placement recommendations.

Truthfulness Scales

There are many terms that address the notion of truthfulness within the context of assessment, treatment and rehabilitation, including *denial*, *problem minimization*, *misrepresentation*, and *equivocation*. The prevalence of denial among patients is extensively discussed in the psychological literature (Marshall, Thornton, Marshall, Fernandez, & Mann, 2001; Brake & Shannon, 1997; Barbaree, 1991; Schlank & Shaw, 1996). The impact the Truthfulness Scale score has on other scale or test scores is contingent upon the severity of denial or untruthfulness. In assessment, socially desirable responding impacts assessment results when respondents attempt to portray themselves in an overly favorable light (Blanchett, Robinson, Alksnis & Sarin, 1997).

Awareness of truthfulness scales (measures) increased with the release of the Minnesota Multiphasic Personality Inventory (MMPI) almost six decades ago. Soon thereafter, socially desirable responding was demonstrated to impact assessment results (Stoeber, 2001; McBurney, 1994; Alexander, Somerfield &

Ensminger, 1993; Paulhus, 1991). Truthfulness Scale conceptualization began in earnest with the idea of self-response accuracy. Test users wanted to be sure that respondents' self-report answers were truthful. **Evaluators and assessors need to know if they can rely upon test data being accurate.**

Research also shows that truthfulness is a factor in diagnosis, treatment effectiveness and recidivism. Because denial is thought to be an important component of assessment and rehabilitative outcomes, various measures have been developed to augment its identification (Schneider & Wright, 2001; Eccles, Stringer, & Marshall, 1997). While some assessments focus on general truthfulness (denial) and others are specific to an offense or problem (Tierney & McCabe, 2001), before denial can be addressed and worked through, it must first be identified.

Client (patient) truthfulness has been associated with more positive treatment outcomes in some individuals (Barber, et. al., 2001; Simpson 2004). Problem minimization has also been linked to lack of treatment progress (Murphy & Baxter, 1997); treatment dropout (Daly & Peloski, 2000; Evans, Libo & Hser, 2009); and client recidivism (Nunes, Hanson, Firestone, Moulden, Greenberg & Bradford, 2007; Kropp, Hart, Webster & Eaves, 1995; Grann & Wedin, 2002). Some researchers (Baldwin & Roys, 1998; Grossman & Cavanaugh, 1990 Haywood & Grossman, 1994; Haywood, Grossman & Hardy, 1993; Nugent & Kroner, 1996; Sefarbi, 1990) have suggested that client denial should be eliminated prior to commencing treatment, whereas others argue that clients should not be excluded from starting treatment due to their denial (Maletzky, 1996). Despite different views on the role of denial at treatment intake, reductions in denial are associated with increased likelihood of treatment success (O'Donohue & Letourneau, 1993). Denial reduction methods include use of survivor reports, directed group work, or addressing cognitive distortions that may cause denial (Schneider & Wright, 2004). Historically, traditional treatment methods (especially in substance abuse treatment) were intense, confrontational and stress-inducing with the goal of breaking down client denial and resistance, however, more contemporary treatment models often take a more non-threatening approach (Sciacca, 1997.)

In summary, truthfulness research has shown that Truthfulness Scales can determine whether-or-not respondents are truthful when completing assessment instruments or tests. And this research has linked Truthfulness Scale scores with treatment programs, treatment outcome, and client (patient) recidivism.

Risk Range Percentile Scores

Each AOA scale is scored independently of the other scales and includes a combination of three elements:

1. Responses to scale items
2. Truthfulness Scale
3. Prior history responses that are contained on the AOA answer sheet

The Truthfulness Scale applies a truth-correction factor so that each scale score is referred to as a Truth-Corrected scale score. The cumulative distribution of truth-corrected scale scores are converted to the percentile scores that are reported in the AOA report.

AOA scale percentile scores represent *degree of severity* which are 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). The cumulative distributions of truth-corrected scale scores determine the cut-off scores for each of the four risk range and severity categories.

HIPPA Compliance

Many agencies and programs are rightfully concerned about protecting respondent (patient, client) confidentiality. The AOA is fully HIPPA compliant. Automatic encryption of names is available for

online test users. Once patient (client) names have been deleted they are gone and cannot be retrieved. Deleting respondent names will not delete demographic information or test data which is downloaded into the AOA database for subsequent analysis. This "name deletion" procedure ensures confidentiality and compliance with HIPPA requirements.

DSM-IV Classification

Psychoactive substance use, abuse, and dependency are discussed and defined in the Diagnostic Statistical Manual of Mental Disorders (DSM-IV) and it is from this source that the Substance Abuse and Substance Dependency classifications scales were adapted.

- *Substance Abuse Classification* incorporates four DSM-IV substance abuse criteria and classification is determined by respondent admission to one of the four DSM-IV substance abuse items.
- *Substance Dependence Classification* incorporates seven DSM-IV substance abuse criteria and classification is determined by respondent admission to three or more of the seven DSM-IV dependency items.

ASAM Recommendations

The Alcohol Scale and Drugs Scales incorporate American Society of Addiction Medicine (ASAM) intervention and/or treatment placement recommendations. ASAM advocates matching patients' addiction severity to commensurate levels of intervention and treatment. The AOA scales identify problems, and scale scores represent problem severity. AOA reports provide treatment recommendations based on problem severity.

AOA SCALES

AOA scales were developed from large item pools. Psychologists familiar with each scale selected initial items using a rational process based upon clearly understood definitions of each scale. The original pool of potential test items was analyzed and the items with the best statistical properties were retained. Final test and item selection were based on each item's statistical properties. It is important that users of the AOA familiarize themselves with the definition of each scale. For that purpose a description of each AOA scale follows.

1. **Truthfulness Scale:** measures client truthfulness while they completed the test.
2. **Self-Esteem Scale:** incorporates an attitude of acceptance-approval versus rejection-disapproval of oneself.
3. **Alcohol Scale:** identifies alcohol use and as appropriate the severity of abuse.
4. **Drugs Scale:** identifies prescription as well as non-prescription drug use and the severity of abuse.
5. **DSM-IV Substance Abuse Scale:** utilizes DSM-IV criteria to classify substance abuse.
6. **DSM-IV Substance Dependency Scale:** utilizes DSM-IV criteria to classify substance dependency.
7. **Violence (Lethality) Scale:** identifies people who are a danger to themselves and others.
8. **Stress Management Scale:** measures the client's ability to manage stress, anxiety and pressure. Stress management techniques and strategies are taught in "stress management classes."

The wealth of alcohol and drug-related information provided in **Adult Outpatient Assessment (AOA)** reports facilitates alcohol and drug abuse/dependency identification, measures problem severity and facilitates matching of problem severity with treatment intensity.

RESEARCH STUDIES

STRESS QUOTIENT

The **Stress Quotient** (SQ) or **Stress Management Scale** is based upon the following mathematical equation:

$$SQ = CS/S \times k$$

The Stress Quotient (SQ) is a numerical value representing a person's ability to handle or cope with stress relative to their amount of experienced stress. CS (Coping Skill) refers to a person's ability to cope with stress. S (Stress) refers to experienced stress. k (Constant) represents a constant value in the SQ equation to establish SQ score ranges. The SQ includes measures of both stress and coping skills in the derivation of the Stress Quotient (SQ) score. The better an individual's coping skills, compared to the amount of experienced stress, the higher the SQ score.

The Stress Quotient (SQ) scale equation represents empirically verifiable relationships. The SQ scale (and its individual components) lends itself to research. Nine studies were conducted to investigate the validity and reliability of the **Stress Quotient** or **Stress Management Scale**.

Validation Study 1: This study was conducted (1980) to compare Stress Management scores between High Stress and Low Stress groups. The High Stress group (N=10) was comprised of 5 males and 5 females. Their average age was 39. Subjects for the High Stress group were randomly selected from outpatients seeking treatment for stress. The Low Stress group (N=10) was comprised of 5 males and 5 females (average age 38.7) randomly selected from persons not involved in treatment for stress. High Stress group Stress Management scores ranged from 32 to 97, with a mean of 64.2. Low Stress group Stress Management scores ranged from 82 to 156, with a mean of 115.7. The t-test statistical analysis of the difference between the means of the two groups indicated that the High Stress group had significantly higher Stress Management scores than the Low Stress group ($t = 4.9$, $p < .001$). This study shows that the Stress Management Scale is a valid measure of stress coping. The Stress Management Scale (hereinafter referred to as SM) significantly discriminates between high stress individuals and low stress individuals.

Validation Study 2: This study (1980) evaluated the relationship between the SM scale and two criterion measures: Taylor Manifest Anxiety Scale and Cornell Index. These two measures have been shown to be valid measures of anxiety and neuroticism, respectively. If the Stress Management (SM) Scale is correlated with these measures it would indicate that the Stress Management Scale is a valid measure. In the Taylor Manifest Anxiety Scale, high scores indicate a high level of anxiety. Similarly, in the Cornell Index high scores indicate neuroticism. Negative correlation coefficients between the two measures and the SM were expected because high SM scores indicate good stress management. The three tests were administered to forty-three (43) subjects selected from the general population. There were 21 males and 22 females ranging in age from 15 to 64 years. Utilizing a product-moment correlation, SM scores attained a correlation coefficient of -.70 with the Taylor Manifest Anxiety Scale and -.75 with the Cornell Index. Both correlations were significant, in the predicted direction, at the $p < .01$ level. These results support the finding that the Stress Management Scale is a valid measure of stress management skills. The reliability of the SM was investigated in ten subjects (5 male and 5 female) randomly chosen from this study. A split-half correlation analysis was conducted on the SM items. The product-moment correlation

coefficient (r) was .85, significant at the $p < .01$ level. This correlation indicates that the Stress Management (SM) Scale is a reliable measure. These results support the Stress Management (SM) Scale as a reliable and valid measure.

Validation Study 3: In this study (1981) the relationship between the SM Scale and the Holmes Rahe Social Readjustment Rating Scale (SRRS) was investigated. The SRRS, which is comprised of a self-rating of stressful life events, has been shown to be a valid measure of stress. Three correlation analyses were done. SRRS scores were correlated with SM scores and separately with two components of the SM scale: Coping Skill (CS) scores and Stress (S) scores. It was hypothesized that the SM and SRRS correlation would be negative, since subjects with lower SM scores would be more likely to either encounter less stressful life events or experience less stress in their lives. It was also predicted that subjects with a higher CS would be less likely to encounter stressful life events; hence a negative correlation was hypothesized. A positive correlation was predicted between S and SRRS, since subjects experiencing more frequent stressful life events would reflect more experienced stress. The participants in this study consisted of 30 outpatient psychotherapy patients. There were 14 males and 16 females. The average age was 35. The SM and the SRRS were administered in counterbalanced order. The results showed there was a significant positive correlation (product-moment correlation coefficient) between SM and SRRS ($r = .4006$, $p<.01$). The correlation results between CS and SRRS was not significant ($r = .1355$, n.s.). There was a significant positive correlation between S and SRRS ($r = .6183$, $p<.001$). The correlations were in predicted directions. The significant correlations between SM and SRRS as well as S and SRRS support the construct validity of the Stress Management (SM) Scale.

Validation Study 4: This validation study (1982) evaluated the relationship between factor C (Ego Strength) in the 16 PF Test as a criterion measure and the SM in a sample of adults. High scores on factor C indicate high ego strength and emotional stability, whereas high SM scores reflect good coping skills. A positive correlation was predicted because emotional stability and coping skills reflect similar attributes. The participants were 34 adjudicated delinquent adolescents. They ranged in age from 15 to 18 years with an average age of 16.2. There were 30 males and 4 females. The Cattell 16 PF Test and the SM scale were administered in counterbalanced order. All subjects had at least a 6.0 grade equivalent reading level. The correlation (product-moment correlation coefficient) results indicated that Factor C scores were significantly correlated with SM scores ($r = .695$, $p<.01$). Results were significant and in the predicted direction. These results support the Stress Management Scale as a valid measure of stress management in adults.

In a subsequent study, the relationship between factor Q4 (Free Floating Anxiety) on the 16 PF Test and S (Stress) on the SM scale was investigated. High Q4 scores reflect free floating anxiety and tension, whereas high S scores measure experienced stress. A high positive correlation between Q4 and S was predicted. There were 22 of the original 34 subjects included in this analysis because the remaining original files were unavailable. All 22 subjects were male. The results indicated that Factor Q4 scores were significantly correlated (product-moment correlation coefficient) with S scores ($r = .584$, $p<.05$). Results were significant and in predicted directions. The significant correlations between factor C and SM scores as well as factor Q4 and S scores support the construct validity of the SM scale.

Validation Study 5: Psychotherapy outpatient clients were used in this validation study (1982) that evaluated the relationship between selected Wiggins MMPI (Minnesota Multiphasic Personality Inventory) supplementary content scales (ES & MAS) as criterion measures and the SM scale. ES measures ego strength and MAS measures manifest anxiety. It was predicted that the ES and SC correlation would be positive, since people with high ego strength would be more likely to possess good coping skills. Similarly, it was predicted that MAS and S correlations would be positive, since people experiencing high levels of manifest anxiety would also likely experience high levels of stress. The subjects were 51 psychotherapy

outpatients ranging in age from 22 to 56 years with an average age of 34. There were 23 males and 28 females. The MMPI and the SM were administered in counterbalanced order. The correlation (product-moment correlation coefficient) results indicated that ES and CS were positively significantly correlated ($r = .29$, $p<.001$). MAS and S comparisons resulted in an r of .54, significant at the $p < .001$ level. All results were significant and in predicted directions.

In a related study (1982) utilizing the same population data (N=51) the relationship between the Psychasthenia (Pt) scale in the MMPI and the S component of the SM scale was evaluated. The Pt scale in the MMPI reflects neurotic anxiety, whereas the S component of the SM scale measures stress. Positive Pt and S correlations were predicted. The correlation (product-moment correlation coefficient) results indicated that the Pt scale and the S component of the SM scale were significantly correlated ($r = .58$, $p<.001$). Results were significant and in the predicted direction. The significant correlations between MMPI scales (ES, MAS, Pt) and the SM scale components (CS, S) support the construct validity of the Stress Management Scale.

Reliability Study 6: The reliability of Stress Management Scale was investigated (1984) in a population of outpatient psychotherapy patients. There were 100 participants, 41 males and 59 females. The average age was 37. The SM was administered soon after intake. The most common procedure for reporting inter-item (within test) reliability is with Coefficient Alpha. The reliability analysis indicated that the Coefficient Alpha of 0.81 was highly significant ($F = 46.74$, $p<.001$). Highly significant inter-item scale consistency was demonstrated.

Reliability Study 7: (1985). The reliability of the Stress Management Scale was investigated in a sample of 189 job applicants. There were 120 males and 69 females with an average age of 31. The SM was administered at the time of pre-employment screening. The reliability analysis indicated that the Coefficient Alpha of 0.73 was highly significant ($F = 195.86$, $p<.001$). Highly significant Cronbach's Alpha reveals that all SM scale items are significantly ($p<.001$) related and measure one factor or trait.

Validation Study 8: Chemical dependency inpatients were used in a validation study (1985) to determine the relation between MMPI scales as criterion measures and the Stress Management Scale. The SM is inversely related to other MMPI scales; consequently, negative correlations were predicted. The participants were 100 chemical dependency inpatients. There were 62 males and 38 females with an average age of 41. The SM and the MMPI were administered in counterbalanced order. The reliability analysis results indicated that the Coefficient Alpha of 0.84 was highly significant ($F = 16.20$, $p<001$). Highly significant inter-item scale consistency was demonstrated.

The correlation (product-moment correlation coefficient) results between the SM and selected MMPI scales were significant at the $p < .001$ level and in predicted directions. The SM correlation results were as follows: Psychopathic Deviate (-0.59), Psychasthenia (-.068), Social Maladjustment (-0.54), Authority Conflict (-0.46), Taylor Manifest Anxiety Scale (-0.78), Authority Problems (-0.22), and Social Alienation (-0.67). The most significant SM correlation was with the Taylor Manifest Anxiety Scale. As discussed earlier, stress exacerbates symptoms of impaired adjustment as well as emotional and attitudinal problems. These results support the Stress Management Scale as a valid measure of stress and management skills.

Validation Study 9: In a replication of earlier research, a study (1986) was conducted to further evaluate the reliability and validity of the Stress Management Scale. The participants were 212 inpatients in chemical dependency programs. There were 122 males and 90 females with an average age of 44. The SM and MMPI were administered in counterbalanced order. Reliability analysis of the SM scale resulted in a Coefficient Alpha of 0.986 ($F = 27.77$, $p<.001$). Highly significant inter-item scale consistency was again demonstrated. Rounded off, the **Coefficient Alpha for the SM was 0.99**.

In the same study (1986, inpatients), product-moment correlations were calculated between the Stress Management Scale (SM) and selected MMPI scales. The SM correlated significantly (.001 level) with the following MMPI scales: Psychopathic Deviate (Pd), Psychasthenia (Pt), Anxiety (A), Manifest Anxiety (MAS), Ego Strength (ES), Social Responsibility (RE), Social Alienation (PD4A), Social Alienation (SC1A), Social Maladjustment (SOC), Authority Conflict (AUT), Manifest Hostility (HOS), Suspiciousness/Mistrust (TSC-II), Resentment/Aggression (TSC-V) and Tension/Worry (TSC-VII). **All SM correlations with selected MMPI scales were significant (at the .001 level of significance) and in predicted directions.** These results support the SM scale or Stress Management Scale as a valid measure of stress and stress management skills.

The studies cited above demonstrate empirical relationships between the SM scale (Stress Management Scale) and other established measures of stress, anxiety and coping skills. This research demonstrates that the Stress Management Scale is a reliable and valid measure of stress management. The SM has high inter-item scale reliability. The SM also has high concurrent (criterion-related) validity with other recognized and accepted tests. The SM scale permits objective (rather than subjective) analysis of the interaction of these important variables.

Early Validation Studies Using AOA

Research 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, clients/patients and counseling patients.

Empirically based Adult Outpatient Assessment scales (or measures) were developed by statistically relating scale item configurations to known substance (alcohol and other drugs) abuse groups. The AOA was then normed against an adult outpatients, court client population, etc.

Classification Validation:

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

TRUTHFULNESS, VIOLENCE & STRESS MANAGEMENT SCALES

PREDICTED RISK RANGE PERCENTAGES FOR EACH 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 assessment.

ASAM and Severity Range Validation:
The inclusion of the American Society of Addiction Medicine (ASAM) intervention and/or treatment recommendations in the Alcohol Scale and Drugs Scale explanatory paragraphs required adjusting severity ranges for these two scales. The Substance Abuse/Dependency Scale incorporates DSM-IV criteria. The Alcohol and Drug Scales measure severity or level or risk. The explanatory scale score paragraphs for these two scales attempt to incorporate ASAM intervention and/or treatment placement recommendations where appropriate.

ALCOHOL AND DRUGS SCALES

SEVERITY RANGES	PERCENTAGES	RECOMMENDED INTERVENTION LEVELS
0 to 29th percent	29%	Non-pathological use
30 to 39th percent	10%	Substance (alcohol/drug) Education
40 to 54th percent	15%	Substance Education Program and AA, NA or CA
55 to 89th percent	35%	Level I (outpatient Treatment)
90 to 95th percent	6%	Level II (Intensive Outpatient/Partial Hospitalization)
96 to 100th percent	5%	Level III (Medically Monitored Intensive Inpatient) Level IV (Medically Managed Intensive Inpatient)

10. Validation Study:
Psychotherapy outpatients were used in this validation study (1982) that evaluated the relationship between selected Wiggin's MMPI (Minnesota Multiphasic Personality Inventory) supplementary content scales (ES & MAS) as criterion measures and the SM scale. ES measures ego strength and MAS measures manifest anxiety. It was predicted that the ES and SC correlation would be positive, since people with high ego strength would be more likely to possess good coping skills. Similarly, it was predicted that MAS and S correlations would be positive, since people experiencing high levels of manifest anxiety would also likely experience high levels of stress. The subjects were 51 psychotherapy outpatients ranging in age from 22 to 56 years with an average age of 34. There were 23 males and 28 females. The MMPI and the SM were administered in counterbalanced order. The correlation (product-moment correlation coefficient) results indicated that ES and CS were positively significantly correlated ($r = .29$, $p<.001$). MAS and S comparisons resulted in an r of .54, significant at the $p < .001$ level. All results were significant and in predicted directions.

AOA SCALES RESEARCH

The Adult Outpatient Assessment (AOA) is designed for adult risk and needs assessment. The AOA was founded on a long history of research and development, much of which is contained in the following summary. AOA research is reported in a chronological format, reporting studies as they occurred. This gives the reader the opportunity to see how the AOA developed 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 scale consideration. Consensual agreement among three Ph.D. level psychologists and other experienced chemical dependency counselors familiar with 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 AOA was then objectively standardized and normed on at risk populations.

11. Validation of the Truthfulness Scale

The Truthfulness Scale in the AOA is an important psychometric scale as these scores establish how truthful the respondent was while completing the AOA. Truthfulness Scale scores determine whether or not AOA profiles are accurate and are integral to the calculation of Truth-Corrected AOA 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 used the 21 Truthfulness Scale items 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 test. Group 2 was instructed to "fake good" while completing the test, but to respond "in such a manner that their faking good would not be detected." The test, which included the AOA Truthfulness Scale, was administered to the subjects and the Truthfulness Scale was embedded in the test as one of the six scales. Truthfulness Scale scores were made up of the number of deviant answers given to the 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 test. The results of this study demonstrate that the Truthfulness Scale accurately detects "Fakers" from those students that took the test honestly.

12. Validation of Four AOA 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 four AOA scales (Truthfulness, Alcohol, Drugs, Stress 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 AOA 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. The Drugs Scale was validated with the MacAndrew and Psychopathic Deviant scales. The Stress Management Scale was validated with the Taylor Manifest Anxiety, Psychasthenia, Social Maladjustment and Social Alienation scales.

Method

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

Results and Discussion

Product-moment correlation coefficients were calculated between AOA scales and MMPI scales. These results are summarized in Table 1. Correlation results presented in Table 1 show that all AOA 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 AOA scales (N = 100)

MMPI SCALES	**AOA SCALES (MEASURES)**			
(MEASURES)	**Truthfulness**	**Alcohol**	**Drugs**	**Stress Coping**
L (Lie) Scale	0.72	-0.38	-0.41	0.53
Psychopathic Deviant	-0.37	0.52	0.54	-0.59
Psychasthenia	-0.34	0.38	0.41	-0.68
Social Maladjustment	-0.25	0.34	0.26	-0.54
Authority Conflict	-0.43	0.31	0.47	-0.46
Manifest Hostility	-0.45	0.34	0.47	-0.58
Taylor Manifest Anxiety	-0.58	0.47	0.46	-0.78
MacAndrew	-0.40	0.58	0.62	-0.33
Social Alienation	-0.47	0.35	0.45	-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 AOA 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 correlation's 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 **Drugs Scale** correlates significantly with the MacAndrew (r = 0.62) Scale and the Psychopathic Deviant (r = 0.54) Scale.

The **Stress Coping Ability 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 stress exacerbates symptoms of impaired adjustment and even psychopathology. The Stress coping Ability 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 AOA scales. All of the AOA scales were highly correlated with the MMPI criterion scale they were tested against. The large correlation coefficients support the validity of the AOA. All product-moment correlation coefficients testing the relation between AOA scales and MMPI scales were significant at the $p < .001$ level.

13. Relationship Between Selected AOA 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 AOA scales were chosen for this study; Truthfulness Scale, Alcohol Scale and Drugs Scale. The Truthfulness Scale was chosen because it is used in the AOA to measure the truthfulness or honesty of the respondent while completing the AOA. The Alcohol and Drugs scales are well suited for comparison with the polygraph exam because of the situation specific nature of the scales. Alcohol and Drugs scale items are direct and relate specifically to alcohol and drug use. The comparison with the Truthfulness Scale is less direct because of the subtle nature of the Truthfulness Scale items as used in the AOA. The Truthfulness Scale is affected by the respondent's attitude, emotional stability and tendencies to fake good. It was expected that the Alcohol and Drugs 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 AOA scales and the Polygraph examination. Tests were given in a counterbalanced order, half of the applicants were given the AOA scales first and the other half of the applicants were administered the polygraph first. The subjects were administered the AOA scales 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 AOA 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 Drugs Scale ($r = 0.56$, $p<.001$).

In summary, this study supports the validity of the AOA Truthfulness, Alcohol and Drugs scales. There were strong positive relationships between the selected AOA scales and the Polygraph examination. The highly significant product-moment correlations between AOA scales and Polygraph examinations demonstrate the validity of the AOA Truthfulness, Alcohol and Drug abuse 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 AOA. The fact that there was a very strong relationship between Polygraph results and AOA scales shows that this type of information can be obtained accurately in self-report instruments.

These results indicate that the AOA Truthfulness Scale is an accurate measure of the respondent's truthfulness or honesty while completing the AOA. 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 AOA 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 AOA is a valid assessment instrument.

14. Validation of AOA Scales in a Sample of Substance Abuse Inpatients

The AOA is a risk and needs assessment instrument that incorporates measures of chemical dependency and substance (alcohol and other drugs) abuse. It is designed for use in clinical and corrections settings. The AOA is a specific test designed for at risk populations. The present study (1987) was conducted to validate the AOA scales 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 AOA 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 Drugs Scale was validated with MMPI MacAndrew Scale and Psychopathic Deviate-Obvious. The Stress 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 AOA 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 AOA and MMPI scales 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 AOA validity, each AOA 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/Aggressive, $p<.001$).

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 Drugs 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 Stress 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).

Table 2. AOA-MMPI Product-moment Correlations (1987) Inpatients, Chemical Dependency Facilities (N = 212)

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

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

The AOA Alcohol and Drugs scales are direct measures of alcohol and drug use or 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 Drugs scales could be affected by the lack of a truthfulness measure which is a deficiency of the MacAndrew Scale. However, the correlation coefficients were still significant.

Where MMPI scales are closely related (by definition) to AOA scales the correlation coefficients were highly significant. For example, the AOA 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 Resistance Scale and MMPI Social Responsibility Scale was r = -.88, and the correlation between the Stress Management Scale and MMPI Tension/Worry Scale was r = -.66. This study supports the validity of the Adult Outpatient Assessment (AOA).

15. Reliability of AOA Scales in a Large Sample of DUI Offenders

This study (1989) was conducted to evaluate the reliability of the AOA Truthfulness Scale, Alcohol Scale, Drugs and Stress Management Scale. There were 1,487 DUI clients included in the study. This study provides a large sample for studying reliability.

Any approach to detection, assessment, or measurement must meet the criteria of reliability and validity. 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.

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 measure 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 and Results

The AOA scales were administered to 1,487 convicted DUI clients. Cronbach's Alpha and the Standardized Alpha were computed as a measure of internal reliability. The results are presented in Table 3.

Table 3. Reliability coefficient alphas. DUI Offenders (N=1,487)
All coefficient alphas are significant at p<.001.

AOA Scales	Cronbach Alpha	Standardized Alpha
Truthfulness Scale	.82	.82
Alcohol Scale	.91	.92
Drugs Scale	.84	.86
Stress Management Scale	.90	.91

These results strongly support the reliability of the AOA scales investigated in this study. All coefficient alphas were highly significant at p<.001. The AOA scales have high internal consistency as measured by Cronbach and standardized coefficient alphas.

AOA RESEARCH

AOA research studies are reported chronologically (as they were done). Consequently the most recent AOA research is presented under the most recent years. Over time AOA statistical properties (reliability, validity and accuracy) continue to improve.

16. Reliability Study of the AOA in a Sample of At-Risk Clients

This study (1991) was conducted to evaluate the reliability of the Adult Outpatient Assessment (AOA) on a sample of clients/patients. The purpose of the study was to test the reliability of the AOA and to standardize the AOA on clients/patients.

Within-test reliability measures to what extent a test with multiple scales measuring different factors, measures each factor independent of the other scales in the test. It also measures to what extent items in each scale consistently measure the particular characteristic that scale was designed to measure. The most common method of reporting within scale inter-item reliability is with coefficient alpha.

Method and Results

The AOA was administered to 397 clients/patients. All clients/patients were male except for one female. The demographic composition of this sample is as follows: Age: 16 to 25 years (8.8%); 26 to 35 years (64.7%); 36 to 45 years (16.4%); 46 to 55 years (10.1%). Ethnicity: Caucasian (75.1%); Black (18.1%); Hispanic (2.8%); Asian (0.5%); American Indian (3.3%); and Other (0.3%). Education: 8th grade or less (1.0%); Some High School (1.0%); GED (4.0%); Business/Technical School (22.7%); College Graduates (27.2%); and Graduate/Professional Degrees (23.4%). Marital Status: Single (47.9%); Married (13.4%); Divorced (25.7%); Separated (1.5%); and Widowed (0.5%).

Reliability coefficient alphas are presented in Table 4. There were 397 clients/patients tested.

Table 4. Reliability coefficient alpha. Clients/Patients (N = 397, 1991) All coefficient alphas are significant at p<.001.

AOA Scales	Coefficient Alpha
Truthfulness Scale	.85
Self Esteem Scale	.94
Alcohol Scale	.90
Drugs Scale	.84
Stress Management Scale	.91

These results strongly support the reliability of the AOA. All coefficient alphas were significant at p<.001. All AOA scales were found to be significantly independent of the other AOA scales as shown by the highly significant within-test coefficient alphas. The obtained Cronbach Coefficient Alphas--a widely used test of inter-item reliability with parallel models--demonstrate that each AOA scale measures essentially one factor or characteristic and all scales show high inter-item congruency. In other words, each AOA scale measures one factor, yet the factor being measured is different from scale to scale. AOA scales have acceptable and empirically demonstrated reliability, as demonstrated by the coefficient alphas cited above. These results indicate that the AOA is a reliable test instrument for adult outpatient assessment.

17. Validity, Reliability and Scale Risk Range Accuracy of the AOA

This study (1997) was conducted to test the validity, reliability and accuracy of the Adult Outpatient Assessment (AOA) assessment instrument. Two statistics procedures were used in the present study to test the validity of the AOA. The first procedure involved t-test comparisons between first clients and multiple clients (discriminant validity) and the second procedure involved statistical decision-making (predictive validity). Number of alcohol arrests was used to define first clients and multiple clients to test discriminant validity of the Alcohol Scale. Similarly, number of drug arrests was used for the Drugs Scale. Because risk is often defined in terms of severity of problem behavior it is expected that multiple clients would score significantly higher on the different scales than first clients. This was an empirical question that was tested in the present study.

In assessment, a measurement can be considered a prediction. For example, the Alcohol Scale is a measure of alcohol abuse or severity of abuse. Alcohol Scale scores would predict if an individual has an alcohol problem. A benchmark that can be used for the existence of an alcohol problem is treatment. If an individual has been in alcohol treatment then the individual is known to have had an alcohol problem. Therefore, the Alcohol Scale should predict if an individual has been in treatment.

Statistical decision-making is closely related to predictive validity of a test. The quality of statistical decision-making and test validity are both assessed by the accuracy with which the test (Alcohol Scale)

classifies "known" cases (treatment). In the present study predictive validity was evaluated in the AOA by using contingency tables defined by scale scores and either treatment or number of arrests. Treatment was used with the Alcohol Scale and Drugs Scale, and number of arrests was used with the Violence Scale.

Risk range percentile scores are calculated for each AOA scale. These risk range percentile scores are derived from scoring equations based on responses to scale items, Truth-Corrections and prior arrest history information, then converted to percentile scores. There are four risk range categories: **Low Risk** (zero to 39th percentile), **Medium Risk** (40 to 69th percentile), **Problem Risk** (70 to 89th percentile) and **Severe Problem or Maximum Risk** (90 to 100th percentile). Risk range percentile scores represent degree of severity.

Analysis of the accuracy of AOA risk range percentile scores involves comparing the risk range percentile scores obtained from client/patient AOA test results to the predicted risk range percentages as defined above. The percentages of clients/patients expected to fall into each risk range is the following: Low Risk **(39%)**, Medium Risk **(30%)**, Problem Risk **(20%)** and Severe Problem or Maximum Risk **(11%)**. The actual percentage of clients/patients falling in each of the four risk ranges, based on their risk range percentile scores, was compared to these predicted percentages.

Method and Results

The AOA was administered to 4,757 clients/patients. There were 4,440 males (93.3%) and 317 (6.7%) females. The demographic composition of this sample is as follows: Age: 19 and younger (12.2%); 20 through 29 (41.7%); 30 through 39 (29%); 40 through 49 (13.3%); 50 through 59 (2.8%); 60 and older (1%). Education: 8th grade or less (2.8%); 9th grade (16.3%); 10th and 11th grade (31.4%); High School Graduate or G.E.D. (38.4%); Partially Completed College (8.8%); College Graduate (2%); Advanced Degree (0.3%). Ethnicity: Caucasian (55.1%); Black (41.3%); Hispanic (0.5%); Asian (1.1%); Native American (1.2%); Other (0.8%). Marital Status: Single (66.9%); Married (14.4%); Divorced (13.6%); Separated (3.9%); Widowed (1.2%).

Reliability coefficient alphas are presented in Table 5 for this sample of 4,757 clients/patients.

Table 5. Reliability coefficient alphas. Clients/patients (N=4,757, 1997) All coefficient alphas are significant at p<.001.	
AOA Scales	**Coefficient Alpha**
Truthfulness Scale	.87
Self-Esteem Scale	.94
Violence Scale	.86
Alcohol Scale	.94
Drugs Scale	.95
Stress Management Scale	.92

The results of the study support the reliability of the AOA. All coefficient alphas are significant at p<.001. All scale reliability coefficients maintained high levels. These results show that the AOA is a reliable risk assessment instrument.

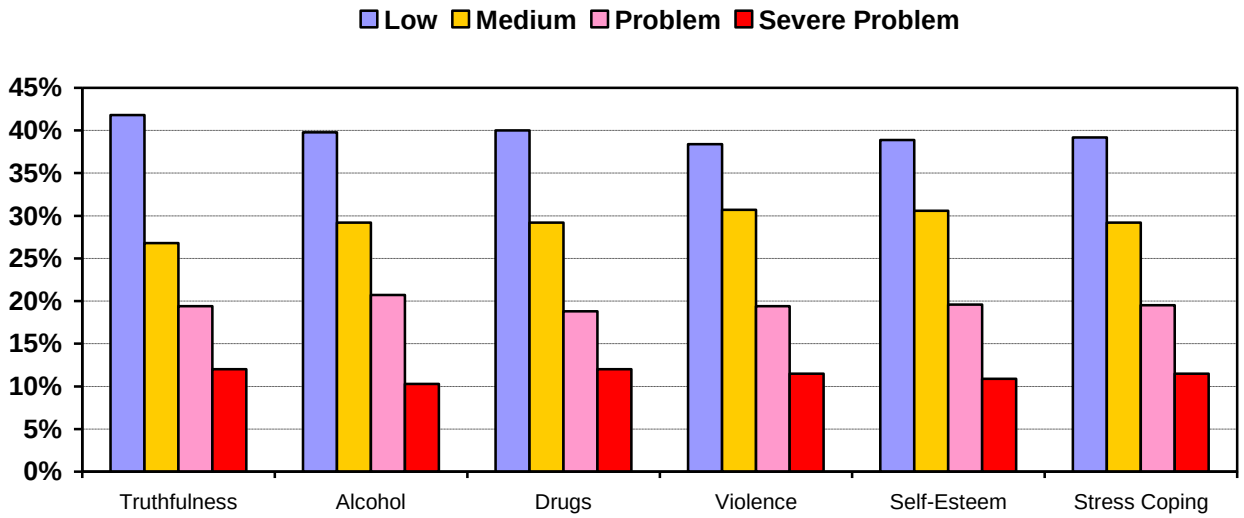
T-tests were calculated for all AOA scales to assess possible sex differences in the clients/patients. Significant gender differences were demonstrated on eight of the 10 AOA scales, i.e., Truthfulness, Alcohol, Drugs, Violence and Stress Management scales. These results are presented in Table 6.

Table 6. Sex differences in the assessment sample (1997, N = 4,757).				
AOA	**Mean Scale Score**			**Significance**
SCALE	**Males**	**Females**	**t value**	**Level**
Truthfulness Scale	7.78	6.53	3.98	p<.001
Alcohol Scale	13.85	12.42	2.12	p=.035
Drugs Scale	18.26	21.97	4.66	p<.001
Violence Scale	10.93	9.92	2.40	p=.016
Stress Management	103.30	96.19	3.11	p=.002

Significant sex differences were not observed on the Self-Esteem Scale, consequently separate male and female scoring procedures were established for the Truthfulness, Alcohol, Drugs, Violence and Stress Management scales.

The analysis of risk assessment is based upon raw risk scores attained by clients/patients on the AOA. The percentage of clients/patients falling into each risk range for each AOA scale (N= 4,757) is presented in Table 7.

Table 7. At-Risk Assessment (1997, N=4,757)



	Truthfulness	Alcohol	Drugs	Violence	Self-Esteem	Stress Coping
Risk Range	%	%	%	%	%	%
Low	41.8	39.8	40.0	38.4	38.9	39.2
Medium	26.8	29.2	29.2	30.7	30.6	29.2
Problem	19.4	20.7	18.8	19.4	19.6	19.5
Severe Problem	12.0	10.3	12.0	11.5	10.9	11.5

The test of predictive validity for the Alcohol Scale is presented in Table 7. Clients who scored between the 40th and 69th percentile are not included in the table because the table distinguishes between problem and no problem behavior. No problem is defined as an Alcohol Scale score at or below the 39th percentile, whereas alcohol-related problematic behavior is defined as an Alcohol Scale score in the 70th or above percentile range. Alcohol treatment information was obtained from clients'/patients' responses to AOA test items.

Table 8. Predictive validity for the Alcohol Scale Using Scale Scores and Alcohol Treatment.

	Alcohol Treatment		
Alcohol Scale	No treatment	One or more treatments	Number in each category
Low Risk (zero to 39th percentile)	1,695 (.86)	50 (.04)	1,745
Problem or Severe Problem Risk (70 to 100th percentile)	285 (.14)	1,214 (.96)	1,499
	1,980	1,264	3,244

These results show that for the 1,264 clients/patients who reported having had alcohol treatment, 1,214 clients/patients, or **96 percent**, had Alcohol Scale scores at or above the 70th percentile. Similarly, of the 1,980 clients/patients who did not have alcohol treatment, 1,695 clients/patients or **86 percent** had Alcohol Scale scores in the Low Risk or no problem range. This lower percentage is reasonable because clients/patients could have a drinking problem without having been in treatment. Combining these results

gives an overall accuracy of the Alcohol Scale of 90 percent. This is very accurate considering that a highly accepted diagnostic procedure, the mammogram, is about 70 percent accurate. These results show there is a very strong positive correlation between Alcohol Scale scores and alcohol treatment.

The predictive validity test of the Drugs Scale was done in the same way using drug treatment as the criterion. Of the 1,342 clients/patients who reported having had drug treatment 1,206 or **90 percent** had Drugs Scale scores in the 70th percentile or higher (Problem Risk and above). Of the 1,923 clients/patients who did not have treatment 1,683 **(88%)** had Drugs Scale scores in the Low Risk (no problem) range. The overall accuracy of the Drugs Scale in predicting drug treatment was **88 percent**. These results show there is a very strong positive correlation between the Drugs Scale and drug treatment.

A similar procedure done where violent or assault arrest was the criteria used for testing the Violence Scale showed nearly as high accuracy as the Alcohol and Drugs scales with treatment accuracy. For the Violence Scale, **80 percent** of the clients/patients who had a violent or assault arrest, had Violence Scale scores at or above the 70th percentile and the overall accuracy was **80 percent**. This means that there is a very strong positive correlation between Violence Scale scores and violent or assault arrests.

Taken together these results strongly support the reliability, validity and accuracy of the AOA. **Reliability coefficient alphas were significant at p<.001 for all AOA scales.** T-test comparisons between first clients and multiple clients support discriminant validity of all but the Truthfulness Scale. Discriminant validity was supported on the Alcohol Scale, Drugs Scale, Violence Scale, Self-Esteem and Stress Management Scale because multiple clients scored significantly higher on the different scales than first clients. Predictive validity of the Alcohol Scale, Drugs Scale and Violence Scale was shown by the accuracy with which the scales identified problem risk behavior (having had treatment or having had an arrest). **The Alcohol Scale had an accuracy of 90 percent, the Drugs Scale had an accuracy of 88 percent and the Violence Scale had an accuracy of 80 percent.** These results support the reliability, validity and accuracy of the AOA.

18. AOA Reliability, Validity and Accuracy in a Large Sample of At-Risk Clients

This study (1999) was carried out on the current 161-item test and included 7,909 clients/patients. The analyses include AOA accuracy for establishing risk, statistical reliability coefficients (alphas) for each AOA scale, discriminant validity analyses between first clients and multiple clients and predictive validity analyses for identification of problem and non-problem drinkers/drug users.

Method and Results

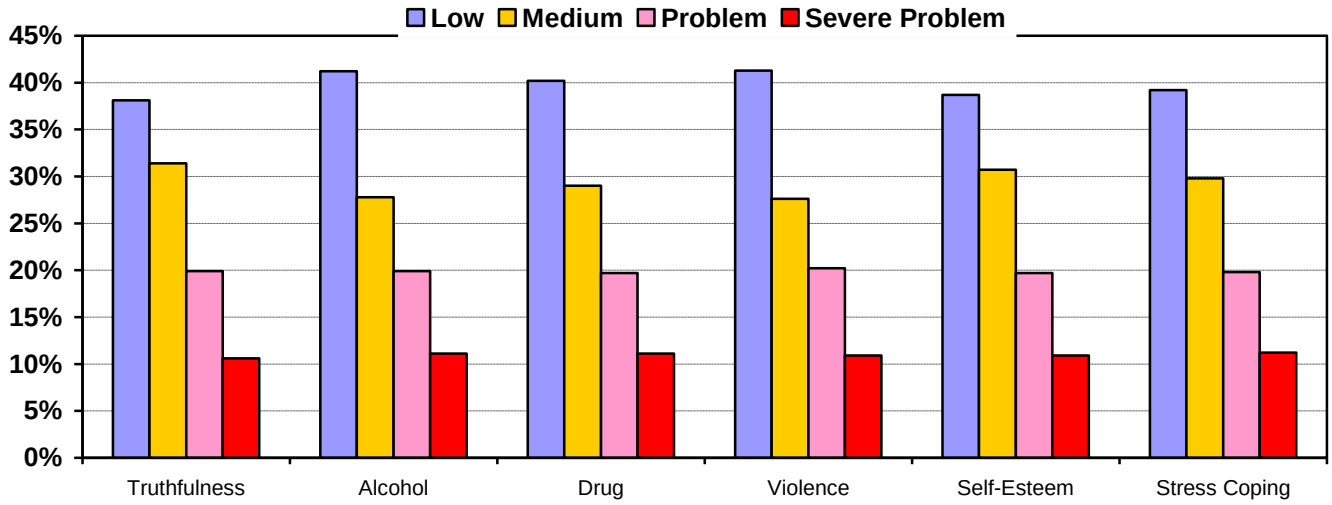
Included in this study (1999) were 7,909 clients/patients. There were 7,010 males (88.6%) and 899 females (11.4%). The demographic composition of this sample is as follows: Age: 19 and younger (3.7%); 20 through 29 (29.6%); 30 through 39 (20.6%); 40 through 49 (10.2%); 50 through 59 (1.8%); 60 and older (0.4%). Education: 8th grade or less (5.7%); Some High School (45.0%); High School Graduate (33.6%); Partially Completed College (12.4%); College Graduate (1.7%); Advanced Degree (1.7%). Ethnicity: Caucasian (43.2%); Black (49.5%); Hispanic (3.2%); Asian (0.2%); Native American (1.5%); Other (2.3%). Marital Status: Single (63.7%); Married (17.9%); Divorced (13.1%); Separated (4.4%); Widowed (0.9%).

For ease in interpreting client risk, the AOA scoring methodology classifies scale scores into one of four risk ranges: **low risk** (zero to 39th percentile), **medium risk** (40 to 69th percentile), **problem risk** (70 to 89th percentile), and **severe problem risk** (90 to 100th percentile). By definition the expected percentage of clients/patients scoring in each risk range (for each scale) is: low risk (**39%**), medium risk (**30%**), problem risk (**20%**), and severe problem risk (**11%**). **Clients who score at or above the 70th percentile are identified as having problems.** For example, clients/patients' Alcohol Scale scores of 70 or above identify them as problem drinkers.

Accuracy of the Adult Outpatient Assessment

The AOA contains eight measurement (or severity) scales. The percentage of clients/patients scoring in each of the four risk categories (low, medium, problem and severe problem risk) is compared to the predicted percentage for each of the eight AOA scales. Table 9 presents these statistics. The differences between obtained and predicted percentages are presented in parentheses in the table below the graph.

Table 9. Adult Outpatient Assessment Scale Risk Ranges (1999, N=7,909)



Scale	Low Risk (39%)		Medium Risk (30%)		Problem Risk (20%)		Severe Problem (11%)	
Truthfulness	38.1	(0.9)	31.4	(1.4)	19.9	(0.1)	10.6	(0.4)
Alcohol	41.2	(2.2)	27.8	(2.2)	19.9	(0.1)	11.1	(0.1)
Drugs	40.2	(1.2)	29.0	(1.0)	19.7	(0.3)	11.1	(0.1)
Violence	41.3	(2.3)	27.6	(2.4)	20.2	(0.2)	10.9	(0.1)
Self-Esteem	38.7	(0.3)	30.7	(0.7)	19.7	(0.3)	10.9	(0.1)
Stress Coping	39.2	(0.2)	29.8	(0.2)	19.8	(0.2)	11.2	(0.2)

As shown in the graph and table above, the AOA scale scores are very accurate. The objectively obtained percentages of clients/patients falling in each risk range are very close to the predicted percentages for each risk category. All of the obtained risk range percentages were within 2.4 percentage points of the expected percentages and most (33) were within 1.5 percentage points. Only five obtained percentages were more than 2% from the predicted, and these were within 2.4 percent. These results demonstrate that the AOA scale scores accurately identify client risk.

Reliability of the Adult Outpatient Assessment

Within-test reliability, or inter-item reliability coefficient alphas for the Adult Outpatient Assessment are presented in Table 10.

Table 10. Reliability of the Adult Outpatient Assessment (1999, N=7,909) All coefficient alphas are significant at p<.001.	
AOA SCALES	**Coefficient Alphas**
Truthfulness Scale	.88
Alcohol Scale	.94
Drugs Scale	.95
Violence Scale	.88
Self-Esteem Scale	.92
Stress Management	.91

As demonstrated above, the Alpha coefficients for all of the Adult Outpatient Assessment scales are above the professionally accepted standard of .80. Indeed, the majority of the scales are at or near .90. These results show that the AOA is a reliable instrument for risk assessment.

Validity of the Adult Outpatient Assessment

The Adult Outpatient Assessment scales measure severity and the extent to which clients/patients have problems. It would be expected, then, that multiple clients (clients/patients who have 2 or more arrests) have higher scale scores than first clients. Therefore, **discriminant validity** of the Adult Outpatient Assessment is shown by significant differences between first and multiple arrest clients. The Alcohol and Drugs Scales were analyzed using alcohol and drug arrests. "Number of alcohol arrests" was used for the Alcohol Scale, which had 5,944 first clients and 1,965 multiple clients. "Number of drug arrests" was used for the Drugs Scale, which had 5,401 first clients and 2,508 multiple clients.

Because "risk" is often defined in terms of severity of problem behavior it is expected that multiple clients would score significantly higher on AOA scales than first clients. The t-test comparisons between first clients and multiple clients for each AOA scale are presented in Table 11 (N=7,909). Multiple clients had two or more arrests as reported on the AOA answer sheet.

Table 11. T-test comparisons between first clients and multiple clients (1999, N=7,909).				
AOA Scale	**First Offenders Mean**	**Multiple Offenders Mean**	**T-value**	**Level of Significance**
Truthfulness Scale	10.12	11.31	t = 6.80	p<.001
Violence Scale	16.05	20.41	t = 12.19	p<.001
Self-Esteem Scale	5.31	1.97	t = 6.81	p<.001
Stress Management	101.63	97.66	t = 2.57	p=.010
Alcohol Scale	12.50	30.30	t = 55.27	p<.001
Drugs Scale	19.13	32.14	t = 39.53	p<.001

*Note: Also the Stress Management Scale is reversed in that the higher the score the better one copes with stress.

All AOA scales demonstrate that multiple clients score significantly higher than first clients. The AOA accurately differentiated between first clients and multiple clients. These results support the validity of the Adult Outpatient Assessment.

As shown in the table above, both the Alcohol Scale and Drugs Scale demonstrate even greater differences than total number of arrests in scale scores between first clients and multiple clients. Both scales are significant at p<.001. The mean Alcohol Scale score for the multiple arrest client group was 30.30 while the first arrest client group mean score was 12.50. The mean Drugs Scale score for the multiple arrest client

offender group was 32.14 while the first arrest client group mean score was 19.13.

Predictive validity

To be considered accurate a screening test must accurately identify both problem clients/patients (drinkers or drug abusers) and non-problem clients/patients. Accurate tests differentiate problem and non-problem clients/patients. The AOA demonstrates it accurately identifies problem prone drinkers and drug abusers.

The criterion in this analysis for identifying clients/patients as problem drinkers is having been in alcohol treatment and for identifying problem drug abusers is direct admission of drug dependency. Having been in treatment identifies clients/patients as having had an alcohol problem. If a person has never had an alcohol problem it is very likely they have not been treated for an alcohol problem. In the AOA treatment and admission of drug dependency information is obtained from the client. Thus, clients/patients are separated into two groups, those who had treatment or admit drug dependency and those who have not had treatment or did not admit drug dependency. Then, client scores on the Alcohol and Drugs Scales are compared. It is predicted that clients/patients with an alcohol treatment history and/or drug dependency will score in the problem risk range (70^{th} percentile and above) on the Alcohol Scale and/or Drugs Scale. Non-problem is defined in terms of low risk scores (39^{th} percentile and below) on the Alcohol Scale and/or Drugs Scale.

Predictive validity analyses show that the Alcohol and Drugs Scales accurately identify clients/patients who have had alcohol treatment and/or admit drug dependency. The AOA Alcohol Scale is very accurate in identifying clients/patients who have alcohol problems. There were 1,604 clients/patients who reported having been in alcohol treatment and these clients/patients are classified as problem drinkers. Of these 1,604 clients/patients, 1,471 clients/patients, or 91.7 percent, had Alcohol Scale scores at or above the 70th percentile. The Alcohol Scale correctly identified nearly all of the clients/patients categorized as problem drinkers. It is interesting to note that 981 clients/patients (23.9%) had Alcohol Scale scores in the problem risk range and did not have treatment. It is likely that some clients/patients have alcohol problems but have not been in treatment. For these individuals treatment is recommended.

The AOA Drugs Scale is also very accurate in identifying clients/patients who have drug problems. There were 2,110 clients/patients who admitted being drug dependent, of these, 2,083 clients/patients, or 98.7 percent, had Drugs Scale scores at or above the 70^{th} percentile. The AOA Drugs Scale achieved a very impressive accuracy. These results support the validity of the AOA Drugs Scale.

SUMMARY

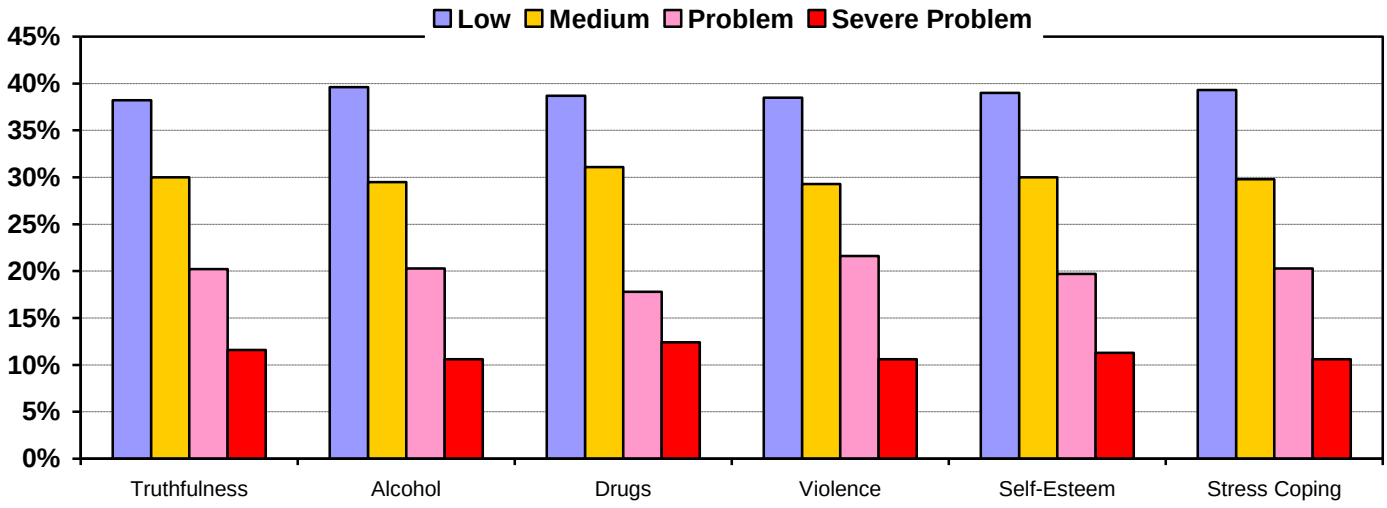
The Adult Outpatient Assessment was administered to 7,909 clients/patients. There were 7,010 males (88.6%) and 899 females (11.4%). The population is broadly defined as Black (49.5%) or Caucasian (43.2%), 20 through 39 years of age (75.6%), and education level of partial High School (45%) or High School Graduate (33.6%).

AOA Accuracy, Reliability and Validity

- AOA scale risk range percentile scores were accurate to within 2.4 percent of predicted for all AOA scales and all risk ranges
- All AOA scales reliability coefficients were .80 or higher and most were at or near .90.
- Discriminant validity analyses show that all AOA Scales significantly discriminate between first and multiple clients.

- Predictive validity analyses show that AOA Alcohol, Drugs and Violence Scales accurately identify problem drinkers, drug abusers and dangerous clients/patients.
- AOA Alcohol Scale correctly identified 92 percent of problem drinkers.
- AOA Drugs Scale correctly identified 99 percent of problem drug abusers.
- AOA Violence Scale correctly identified 99 percent of violent clients/patients.

Table 12. Adult Outpatient Assessment Scale Risk Ranges (2009, N=2,382)



Scale	Low Risk (39%)		Medium Risk (30%)		Problem Risk (20%)		Severe Problem (11%)	
Truthfulness	38.2	(0.8)	30.0	(0.0)	20.2	(0.2)	11.6	(0.6)
Alcohol	39.6	(0.6)	29.5	(0.5)	20.3	(0.3)	10.6	(0.4)
Drugs	38.7	(0.3)	31.1	(1.1)	17.8	(2.2)	12.4	(1.4)
Violence	38.5	(0.5)	29.3	(0.7)	21.6	(1.6)	10.6	(0.4)
Self-Esteem	39.0	(0.0)	30.0	(0.0)	19.7	(0.3)	11.3	(0.3)
Stress Coping	39.3	(0.3)	29.8	(0.2)	20.3	(0.3)	10.6	(0.4)

19. AOA Test Statistics for a Large Sample of Court-Related Clients

This study (2009) examines AOA test statistics for 2,382 clients/patients. Test data was returned to Behavior Data Systems, Ltd. between January 2002 and December 2009.

Method and Results

Included in this study (2009) were 2,382 clients/patients in the Southern 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 test that is reliable will result in similar scores for the initial test and re-tests. Clients answer test items consistently, either indicating they have a problem, no problem or something in between. This allows for a test of reliability. 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. AOA scale reliability is presented in Table 13.

Table 13. Reliability coefficient alphas (n=2,382, 2009). All alphas are significant at p<.001

AOA SCALES	Coefficient Alphas
Truthfulness Scale	**.86**
Alcohol Scale	**.94**
Drugs Scale	**.96**
Violence Scale	**.88**
Self-Esteem Scale	**.88**
Stress Management	**.91**

All AOA scales attain alpha coefficients considerably higher than .75, the professionally accepted reliability threshold. All Adult Outpatient Assessment scales demonstrate excellent reliability.

Table 14 (below) presents AOA accuracy analysis results, which involves comparison of client-attained scale scores against predicted scores for the four risk range categories used in the AOA. 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/patients into appropriate levels of intervention, treatment and supervision.

Table 14. AOA Risk Range Accuracy (N=2,382, 2009)

Scale	Low Risk (39%)		Medium Risk (30%)		Problem Risk (20%)		Severe Problem (11%)	
Truthfulness Scale	43.2	**(4.2)**	28.5	**(1.5)**	17.6	**(2.4)**	10.8	**(0.2)**
Alcohol Scale	40.4	**(1.4)**	30.4	**(0.4)**	19.2	**(0.8)**	10.0	**(1.0)**
Drugs Scale	40.2	**(1.2)**	30.4	**(0.4)**	19.1	**(0.9)**	10.3	**(0.7)**
Violence Scale	38.8	**(0.2)**	31.7	**(1.7)**	19.4	**(0.6)**	10.1	**(0.9)**
Self-Esteem Scale	39.5	**(0.5)**	29.1	**(0.9)**	20.5	**(0.5)**	10.9	**(0.1)**
Stress Management	39.4	**(0.4)**	31.6	**(1.6)**	18.7	**(1.3)**	10.3	**(0.7)**

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 14. The percentages for each Adult Outpatient Assessment scale and risk range category were obtained from the cumulative distribution of clients/patients scale scores. The average difference between predicted percentages and obtained percentages for all scales and risk ranges is 0.7 percentage points. This is accurate assessment.

On average, females scored more severely than males on the Self-Esteem and Stress Management scales, indicating that female clients/patients could have more severe drug abuse problems and were experiencing a higher degree of distress and lower levels of self-esteem as well as decreased ability to handle stress.

Table 15. Sex differences in Court-Related Clients (2009, N=2,382).				
AOA	**Mean Scale Score**			**Significance**
SCALE	**Males**	**Females**	***T*-value**	**Level**
Truthfulness Scale	9.25	6.18		p<.001
Alcohol Scale	20.23	10.45		p<.001
Drugs Scale	28.91	26.85		p<.001
Violence Scale	21.59	17.94		p<.001
Self-Esteem Scale	4.14	0.91		p<.001
Stress Management	95.09	68.52		p<.001

Conclusion

Adult Outpatient Assessment (AOA) scale scores are accurate. All AOA scales identified nearly all clients/patients that admitted to having serious problems with alcohol, drugs and violence tendencies. Correlation analysis between client arrest history and AOA scale scores supports the predictive validity of AOA scales. AOA screening accurately identifies clients/patients with problems. AOA test results are individualized and facilitate recommendations for supervision levels and intervention/treatment programs. The multiple scales and inclusion of arrest history in the AOA are well-suited for recidivism prediction.

20. AOA Reliability, Validity and Accuracy in a Sample of High Risk Clients

This study (2010) utilized AOA test data for 1,071 clients/patients in a southeastern U.S. state. The analyses include AOA accuracy for establishing risk, statistical reliability coefficients (alphas) for each AOA scale, discriminant validity analyses of first clients and multiple clients and predictive validity analyses for identification of problem and non-problem drinkers/drug users.

Method and Results

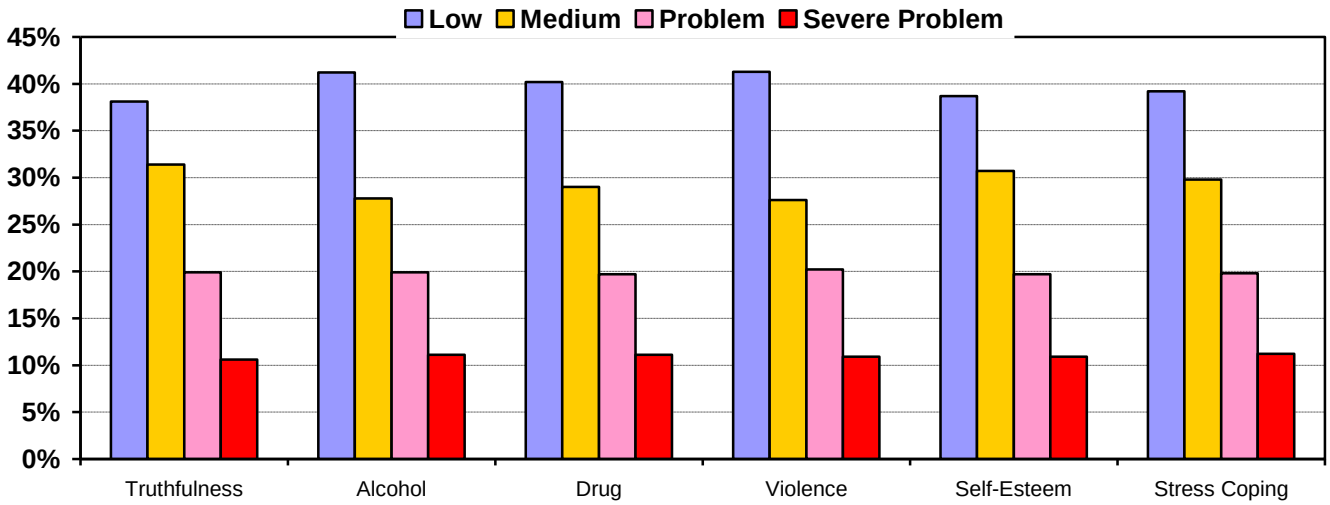
Included in this study (2010) were 1,071 clients/patients. There were 882 males (82.4%) and 189 females (17.6%). The demographic composition of this sample is as follows: Age: 19 and younger (1.1%); 20 through 29 (32.6%); 30 through 39 (37.1%); 40 through 49 (21.5%); 50 through 59 (6.4%); 60 and older (1.3%). Education: 8th grade or less (6.3%); Some High School (39.4%); High School Graduate or GED (47.0%); Trade or Technical School (0.6%); Partially Completed College (5.9%); College Graduate (0.8%); Advanced Degree (0.1%). Ethnicity: Caucasian (62.5%); Black (33.6%); Hispanic (2.8%); Asian (0.5%); Other (0.5%). Marital Status: Single (49.6%); Married (22.3%); Divorced (19.4%); Separated (5.9%); Widowed (2.8%).

For ease in interpreting client risk, the AOA scoring methodology classifies scale scores into one of four risk ranges: **low risk** (zero to 39th percentile), **medium risk** (40 to 69th percentile), **problem risk** (70 to 89th percentile), and **severe problem risk** (90 to 100th percentile). By definition, the expected percentage of clients/patients scoring in each risk range (for each scale) is: low risk (**39%**), medium risk (**30%**), problem risk (**20%**), and severe problem risk (**11%**). **Clients who score at or above the 70th percentile are identified as having problems.** For example, clients/patients' Alcohol Scale scores at the 70th percentile or above identify them as problem drinkers.

Accuracy of the Adult Outpatient Assessment

The AOA contains eight measurement (or severity) scales. The percentage of clients/patients scoring in each of the four risk categories (low, medium, problem and severe problem risk) is compared to the predicted percentage for each of the eight AOA scales. Table 16 presents these statistics. The differences between obtained and predicted percentages are presented in parentheses in the table below the graph.

Table 16. Adult Outpatient Assessment Scale Risk Ranges (2010, N=1,071)



Scale	Low Risk (39%)		Medium Risk (30%)		Problem Risk (20%)		Severe Problem (11%)	
Truthfulness Scale	41.5	**(2.5)**	27.5	**(2.5)**	22.8	**(2.8)**	8.2	**(2.8)**
Alcohol Scale	40.6	**(1.6)**	29.9	**(0.1)**	19.4	**(0.6)**	10.1	**(0.9)**
Drugs Scale	41.4	**(2.4)**	28.9	**(1.1)**	18.6	**(1.4)**	11.1	**(0.1)**
Violence Scale	38.8	**(0.2)**	31.8	**(1.8)**	19.2	**(0.2)**	10.2	**(0.8)**
Self-Esteem Scale	40.2	**(1.2)**	29.3	**(0.7)**	20.3	**(0.3)**	10.2	**(0.8)**
Stress Coping	40.0	**(1.0)**	30.0	**(0.0)**	19.6	**(0.4)**	10.4	**(0.6)**

As shown in the graph and table above, the AOA scale scores are very accurate. The objectively obtained percentages of clients/patients falling in each risk range are very close to the predicted percentages for each risk category.

All of the obtained risk range percentages were within 2.8 percentage points of the expected percentages. These results demonstrate that the AOA scale scores accurately identify risk.

Reliability of the Adult Outpatient Assessment

Within-test reliability, or inter-item reliability coefficient alphas for the Adult Outpatient Assessment are presented in Table 17.

Table 17. Reliability of the Adult Outpatient Assessment (2010, N=1,071)
All coefficient alphas are significant at p<.001.

AOA SCALES	Coefficient Alphas
Truthfulness Scale	**.89**
Alcohol Scale	**.91**
Drugs Scale	**.89**
Violence Scale	**.87**
Self-Esteem Scale	**.89**
Stress Management	**.94**

The alpha coefficients for all of the Adult Outpatient Assessment scales are considerably above the professionally accepted standard of .75. These results show that the AOA is a reliable instrument for risk assessment.

Validity of the Adult Outpatient Assessment

Adult Outpatient Assessment (AOA) scales measure severity and the extent to which clients/patients have problems. Therefore, it would be expected that most multiple clients (clients/patients who have 2 or more arrests) have higher scale scores than first clients. Discriminant validity of the Adult Outpatient Assessment is shown by significant differences between first and multiple clients.

Table 18. T-test comparisons between client first arrest and client with multiple arrests (2010, N=1,071).

AOA Scale	First Offenders Mean	Multiple Offenders Mean	T-value	Level of Significance
Truthfulness Scale	9.45	7.24	3.25	p<.001
Alcohol Scale	20.79	20.79	-5.96	p<.001
Drugs Scale	6.47	-.10	3.66	p<.001
Violence Scale	16.34	19.55	-2.00	p<.001
Self-Esteem Scale	15.72	25.45	-8.97	p<.001
Stress Management	111.10	97.78	2.36	p<.001

*Note: The Self-Esteem Scale and the Stress Management Scale scores are reversed, in that higher scores represent lower risk; for all other AOA scales, higher scales indicate more severe problems.

In these analyses (Table 18), the answer sheet history items were used to define first clients and multiple clients (2 or more arrests). There were 58 first clients and 1,013 multiple clients. Because *risk* is often defined in terms of severity of problem behavior, it is expected that multiple clients would score significantly higher on AOA scales than first clients. The *t*-test comparisons of first clients with multiple clients for each AOA scale are presented in Table 18 (N=1,071) on the following page. Multiple clients had two or more arrests as reported on the AOA answer sheet.

With the exception of the Truthfulness Scale, multiple clients' average AOA scale scores were significantly higher than the average scores of first clients. First clients attaining a higher average score on the AOA Truthfulness Scale may indicate that clients with no more than one arrest were prone to denial or problem minimization. Multiple clients may have been more forthcoming about their problems. This comparative analysis demonstrates that the AOA accurately differentiates between first clients and multiple clients. These results support the validity of the Adult Outpatient Assessment.

21. AOA Reliability, Validity and Accuracy of Clients Tested

This study (2019) utilized AOA test data for 573 clients/patients administered the AOA by clients of Behavior Data Systems. The analyses include AOA accuracy for establishing risk, statistical reliability coefficients (alphas) for each AOA scale, discriminant validity analyses of first clients and multiple clients and predictive validity analyses for identification of problem and non-problem drinkers/drug users.

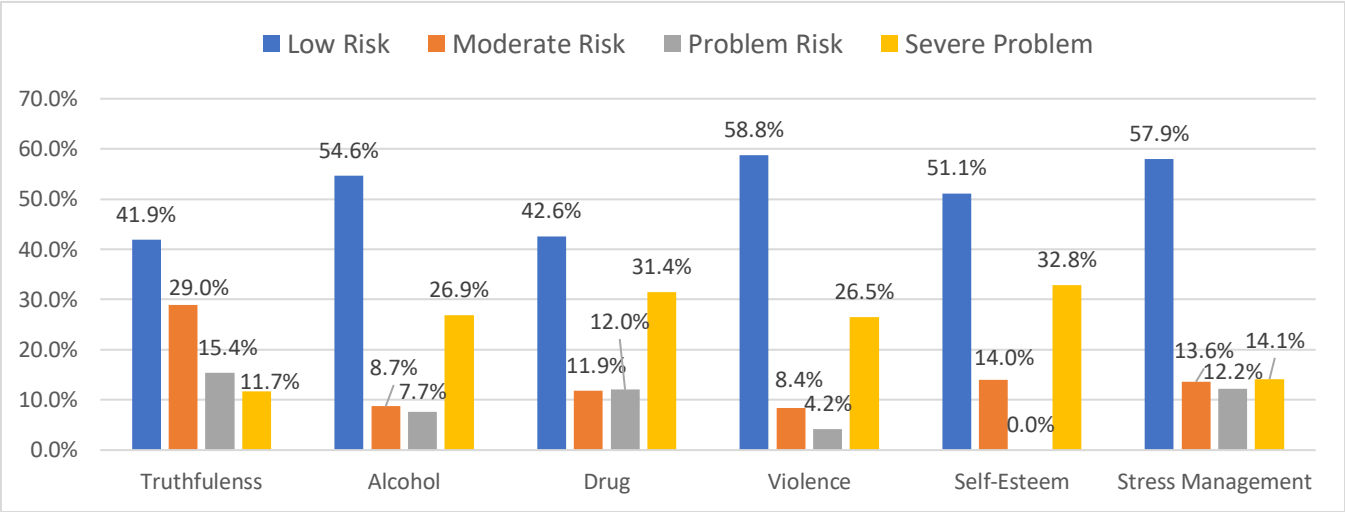
Method and Results

Included in this study (2019) were 573 clients/patients. There were 382 male (66.7%) and 191 females (33.3%). The demographic composition of the sample is as follows: Age: 20 or younger (8.7%), 21 to 30 (38.9%), 31 to 40 (24.8%), 41 to 50 (14.3%), 51 to 60 (11.3%), and 61 or older (1.9%). Education: 8th

grade or less (33.9%), some high school (14.0%), graduated high school (40.5%), obtained a GED (4.2%), trade or technical school (3.5%), and some college (3.1%). Ethnicity: Caucasian (68.2%), African American (15.4%), Hispanic (3.8%), Asian (0.2%), Native American (3.7%), and responded other (1.9%). Marital Status: single (47.3%), married (26.2%), divorced (14.3%), separated (4.2%), and widowed (1.4%).

For each in interpreting client risk, the AOA scoring methodology classifies scale scores into one for four risk ranges: **low risk** (0 to 39th percentile), **moderate risk** (40th to 69th percentile), **problem risk** (70th to 89th percentile), and **severe problem risk** (90th to 100th percentile). By definition, the expected percentage of clients/patients scoring in each risk range (for each scale) is: low risk (**39%**), moderate risk (**30%**), problem risk (**20%**), and severe problem risk (**11%**). **Clients who score at or above the 70th percentile are identified as having problems.** For example, clients'/patients' Alcohol Scale scores at the 70th percentile or above identify them as problem drinkers.

Table 19. Adult Outpatient Assessment Scale Risk Ranges (2019, N=573)



Scale	Low Risk		Moderate Risk		Problem Risk		Severe Problem	
Truthfulness	41.9%	**2.9%**	29.0%	**-1.0%**	15.4%	**-4.6%**	11.7%	**0.7%**
Alcohol	54.6%	**15.6%**	8.7%	**-21.3%**	7.7%	**-12.3%**	26.9%	**15.9%**
Drug	42.6%	**3.6%**	11.9%	**-18.1%**	12.0%	**-8.0%**	31.4%	**20.4%**
Violence	58.8%	**19.8%**	8.4%	**-21.6%**	4.2%	**-15.8%**	26.5%	**15.5%**
Self-Esteem	51.1%	**12.1%**	14.0%	**-16.0%**	0.0%	**-20.0%**	32.8%	**21.8%**
Stress Management	57.9%	**18.9%**	13.6%	**-16.4%**	12.2%	**-7.8%**	14.1%	**3.1%**

As shown in the graph and table above, this sample of AOA tests appear to be skewed towards the Low Risk range on the Alcohol, Violence, Self-Esteem, and Stress Management Scales. The Severe Problem ranges on the Alcohol, Drug, Violence, and Self-Esteem Scales are each at least 10 percentage points above the expected 11% of offenders for the range. All ranges on the Truthfulness Scale were very close to the expected percentages, respectively. The skewed data is likely due to the small sample size used for this sample of tests.

Reliability of the Adult Outpatient Assessment

Within-test reliability, or inter-item reliability coefficient alphas for the Adult Outpatient Assessment are presented in Table 20.

Table 20. Reliability of the Adult Outpatient Assessment (2019, N=573)
All coefficient alphas are significant at p<.001.

AOA SCALES	Coefficient Alphas
Truthfulness Scale	**.90**
Alcohol Scale	**.95**
Drugs Scale	**.94**
Violence Scale	**.95**
Self-Esteem Scale	**.94**
Stress Management	**.96**

The alpha coefficients for all of the Adult Outpatient Assessment scales are considerably above the professionally accepted standard of .75. These results show that the AOA is a reliable instrument for risk assessment.

Validity of the Adult Outpatient Assessment

Adult Outpatient Assessment (AOA) scales measure severity and the extent to which clients/patients have problems. Therefore, it would be expected that most repeat clients (clients/patients who have 2 or more arrests) have higher scale scores than first-time clients. Discriminant validity of the Adult Outpatient Assessment is shown by significant differences between first-time and repeat offenders.

Table 21. T-test comparisons between client first arrest and client with multiple arrests (2019, N=573)

AOA Scale	First-time Offenders Mean	Repeat Offenders Mean	T-value	Level of Significance
Truthfulness Scale	9.64	10.32	-0.73	p=.468
Alcohol Scale	11.54	27.58	-8.22	p<.001
Drugs Scale	16.15	28.82	-6.67	p<.001
Violence Scale	12.81	17.79	-4.98	p<.001
Self-Esteem Scale	14.23	11.57	1.44	p=.152
Stress Management	123.80	113.32	2.23	p=.026

*Note: The Self-Esteem Scale and the Stress Management Scale scores are reversed, in that higher scores represent lower risk; for all other AOA scales, higher scales indicate more severe problems.

In these analyses (Table 21), the answer sheet history items were used to define first clients and multiple clients (2 or more arrests). There were 329 first-time offenders and 230 repeat offenders. Because *risk* is often defined in terms of severity of problem behavior, it is expected that repeat clients would score significantly higher on AOA scales than first-time clients. The t-test comparisons of first-time offenders with repeat offenders for each AOA scale are presented in Table 21 (N=573) on the following page. Repeat offenders had two or more arrests as reported on the AOA answer sheet.

Repeat offenders average AOA scale scores were significantly higher than the average scores of first-time offenders on the Alcohol, Drugs, Violence, and Stress Management Scales. Repeat offenders appear to suffer from more severe alcohol, drug, violence, and stress issues than first-time offenders. This comparative analysis demonstrated that the AOA accurately differentiates between first-time offenders and repeat offenders. These results support the validity of the Adult Outpatient Assessment.

SUMMARY

In conclusion, this document is not intended as an exhaustive compilation of AOA research. Yet, it does summarize many studies and research that support the reliability, validity and accuracy of the AOA. The research contained herein has been presented chronologically -- as it emerged. This research presentation gives the reader an insight into the evolution of the AOA as a state-of-the-art assessment instrument. Over time, the AOA has evolved into a state-of-the-art assessment instrument. The AOA presents an increasingly accurate picture of at-risk clients/patients.

Although AOA research and development actually began with the Stress Quotient Scale (later titled the Stress Management Scale) in 1980, AOA research and development began in 1991. And, the AOA came into its own as a state-of-the-art assessment instrument in 2010. The studies presented herein support the reliability, validity and accuracy of the AOA. Early research was exploratory, whereas more recent research demonstrates the AOA's reliability, validity and accuracy. The AOA provides a sound empirical foundation for responsible decision making.

Empirically based AOA scales (or measures) were developed by statistically relating scale item configurations to known at-risk client/patient groups. The AOA was then normed against an identified population. Thus, the AOA has been researched, normed and validated on clients/patients. And, when the AOA is being introduced to a new population, it is recommended that the AOA be administered to a representative sample for database and standardization comparison purposes. Then, as warranted scale distributions can be adjusted accordingly for maximum efficiency.

The AOA research strongly supports the reliability, validity and accuracy of the AOA. Reliability coefficient alphas were significant at $p<.001$ for all AOA scales. T-test comparisons between first clients and multiple clients support discriminant validity of the Alcohol, Drugs, Violence, Self-Esteem and Stress Management scales because multiple clients scored significantly higher on the different scales than first clients. Predictive validity of the Alcohol Scale, Drugs Scale and Violence Scale was shown by the accuracy with which the scales identified problem risk behavior (having had treatment or having had an arrest). The research summarized herein strongly supports the reliability, validity, and accuracy of the AOA.

The AOA is not a personality test, nor is it a clinical diagnostic instrument. The AOA is a risk and needs assessment instrument. The population studied consists of clients/patients and the criteria is risk and need. Future AOA research will continue to explore important parameters for accurate risk and needs assessment.

Areas of future research are many and complex. AOA research continues to evaluate age, gender, ethnicity, education and arrest history. Consistent with the foregoing, we encourage more research involving AOA assessment. Few fields of assessment represent such important opportunities for creative discovery. The AOA is committed to such research.

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