

Missouri Division of Youth Services Assessing Treatment Outcome

Pre-Post Inventory

November 13, 2003

Missouri Division of Youth Services' Pre-Post Inventory outcome analyses for 232 youths are summarized. This report follows a previous report dated August 28, 2002. Altogether 1,235 youths were tested with the Pre-Post Inventory (PPI). 758 youths took the pretest only, 245 youths took the posttest only and 232 youths completed both the pretest and posttest. This report is provided by Behavior Data Systems, Ltd. as a professional courtesy. Additional information can be provided upon request.

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Table of Contents

Pre-Post Inventory	ii
PPI Scales	ii
Assessing Treatment Outcome	iii
Pre-Post Outcome Analysis (N=232)	1
Pre-Post Comparison Index	1
Here and Now 10-Point Recency Comparison	2
Client Program Rating	3
Self-Rating of Problems.....	4
Structured Interview Pre-Post Comparison.....	5
Summary.....	7
PPI Accuracy, Reliability & Validity (N=990).....	8
PPI Accuracy	8
PPI Reliability	9
PPI Validity.....	10
Conclusion.....	11
Appendix.....	12

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Pre-Post Inventory

Preface

The Pre-Post Inventory (PPI) is an objective pretest-posttest outcome assessment instrument or test. It has 148 items and takes 30 minutes to complete. It is written at a 5th to low 6th grade reading level. Computer scoring and printing reports takes 2½ minutes on-site. The PPI has 7 scales (measures) which are described below. The Pre-Post Inventory provides objective outcome measures for counseling (individual and group) and treatment settings. A more in-depth description of the PPI, as well as an example report, research and annual summary reports, can be found on Behavior Data Systems, Ltd. website at www.bdsltd.com.

Seven Pre-Post Inventory Scales (Measures)

1. **Truthfulness Scale:** Determines how truthful the youth was while completing the test. This scale identifies defensiveness, denial, problem minimization and attempts to “fake good.”
2. **Self-Esteem Scale:** Reflects a youth’s explicit valuing and appraisal of self. Self-Esteem incorporates an attitude of acceptance-approval versus rejection-disapproval. It measures a person’s perception of self.
3. **Resistance Scale:** Measures resistance to help and uncooperativeness. This scale varies directly with the youth’s attitude and outlook. Some people resist help; whereas, others accept it.
4. **Distress Scale:** Measures pain, misery and suffering. Distress incorporates pain imposed by physical and mental abuse. Distress also includes anguish, anxiety and depression.
5. **Alcohol Scale:** Measures the severity of alcohol use and related problems. Alcohol refers to beer, wine and other liquors.
6. **Drugs Scale:** Measures illicit drug use and abuse. Drugs refer to marijuana, crack, cocaine, ecstasy, amphetamines, barbiturates and heroin. The Drugs Scale is independent of the Alcohol Scale. It measures the severity of drug use.
7. **Stress Coping Abilities Scale:** Measures the youth’s ability to cope effectively with tension, stress and pressure. Stress exacerbates emotional and mental health symptoms. This scale is a non-introversive way to screen for the presence of identifiable (diagnosable) mental health problems.

There are three Pre-Post Inventory reports. The Pretest report is generated the first time a client is tested. The Posttest report is produced when the same person is tested the second (and subsequent) time. When the Posttest is scored, the evaluator has the option of printing the **Comparison Report**. The **Comparison Report** is a computer-generated comparison of pretest and posttest results. Scale scores are summarized in terms of having improved, stayed the same or gotten worse.

The Missouri Division of Youth Services administered the Pre-Post Inventory (PPI) to 1,235 youths. There were 758 youths who only took the pretest, 245 youths who only took the posttest and 232 youths who completed both pretest and posttest. There are more pretest results because some youths are still in the program and have not been given the posttest, while other youths may have been transferred or for whatever reason have not taken the

posttest. Some youth had been in the program at the start of PPI testing and were given the posttest but they did not take the pretest. This accounts for the lower number of youths (232) who had both pretest and posttest results as opposed to the total number of posttest (477) results. PPI outcome analyses are presented for the 232 youths that completed both the pretest and posttest. Analyses of PPI test results are also presented for all 990 (758+232) youths who had completed the pretest.

Assessing Treatment Outcome

Assessing treatment **outcome** involves answering the question: Has the youth improved, stayed the same or gotten worse? Many practitioners, referral sources and treatment agencies have wanted an accurate and standardized way to objectively assess counseling and treatment effectiveness or outcome. On the surface, this outcome question appears straightforward. But, what should be used as the criteria for treatment program effectiveness?

Some experts believe that there should be a national standard for assessing treatment outcome. While all agree that outcomes are important, there is a lack of consensus among experts on the advantages of national standardization of the program evaluation process. The issue of outcome criteria will likely always be controversial.

The Pre-Post Inventory (PPI) was developed to answer juvenile treatment outcome questions. The PPI provides test—retest comparisons at important stages of treatment, for example, intake, change of status, completion and outcome. **The PPI compares a youth's posttest scores against their pretest scores.** It compares a person upon counseling/treatment completion with the person they were when they were admitted to the program. This type of comparison, then, focuses on outcome issues, i.e., did the youth get better, stay the same or get worse?

To assess treatment outcome, the outcome criteria must be defined and accepted. The Pre-Post Inventory (PPI) measures traditional areas of counseling inquiry: Truthfulness, Self-Esteem, Resistance, Distress (anxiety and depression), Alcohol Abuse, Illicit Drug Abuse and Stress Coping Abilities. These seven Pre-Post Inventory scales are PPI outcome criteria. Youths' pretest scores serve as the basis for subsequent posttest comparison. It is assumed that all of the PPI scales will improve or stay the same in "successful" counseling programs. If scales are not problematic at pretest, they should not vary that much upon posttest.

The Pre-Post Inventory (PPI) has a "here-and-now" time referent. This present tense time reference enables administering the PPI at 30-day intervals. Because of this time referent the same test can be administered at intake (pretest), at 3, 6 or 12 month intervals and at program completion (posttest). Court history is eliminated from the PPI because such history may set limits below which scale scores cannot go. Eliminating history allows scale scores to vary. For example, they can stay the same, get better or become worse.

In sum, Pre-Post Inventory scales are objective treatment outcome criteria that have a here-and-now time reference. Scale scores vary according to the youth's perception of problems, concerns and needs. **It is the patient's opinion with all its biases that is most relevant for the initiation and continuation of treatment.** The PPI gives the youth a voice in the evaluation of their treatment program and its outcome.

**Missouri Division of Youth Services: Pre-Post Outcome Analysis
N = 232 Youths**

The primary measure of treatment outcome in the Pre-Post Inventory (PPI) is the **Comparison Index**. This index compares pretest (first test administration) scale scores with posttest (second or subsequent test administration) scale scores. All PPI scales are represented in the Comparison Index. For each scale, the index is gotten by subtracting the posttest scale score from the pretest scale score (pretest minus posttest). A positive difference represents client improvement, that is, their scale score was lower at posttest than it was at pretest. If the difference between pretest and posttest scale scores is zero, the youth stayed the same. And, a negative difference means that the youth got worse, i.e., their posttest scale score was higher than their pretest score.

The pretest-posttest Comparison Index is presented in the following table. For each PPI scale the mean or average scale score is presented for pretest and posttest scores along with the difference (pretest-posttest) presented in the right-hand column. There are 232 youths included in this analysis. These youths had both pretest and posttest data.

Pre-Post Comparison Index			
PPI Scales	Pretest Mean Score	Posttest Mean Score	Pretest-Posttest Difference
Truthfulness Scale	23.22	21.47	1.75
Alcohol Scale	15.27	12.60	2.69
Drugs Scale	19.65	11.70	7.95
Distress Scale	17.56	11.75	5.81
Resistance Scale	10.63	8.37	2.26
Self-Esteem Scale	20.60	30.68	10.08
Stress Coping Abilities	98.78	124.45	25.67

Note: Scores on the Self-esteem and Stress Coping Abilities Scales are reversed in that higher scores are associated with better self-esteem and stress coping abilities.

For all PPI scales, posttest scores were lower than pretest scores. Youths, on average, improved at posttest. Posttest scores were significantly lower than pretest scores at the $p < 0.001$ level of significance. Lower scale scores at posttest means that treatment programs were effective. And this great degree of significance ($p < .001$) demonstrates that the Missouri Division of Youth Services treatment program is very effective.

Truthfulness Scale score pre-post comparison demonstrates that the youths became significantly more open and honest while completing the PPI at posttest. The youths were less inclined toward denial, problem minimization and attempts to fake good. Youths' alcohol and drug problem severity was positively changed after treatment. Lower posttest Alcohol Scale scores shows that youths significantly reduced their

alcohol problem severity after being in treatment. Drugs Scale scores were lower, by a wide margin, at posttest compared to pretest scores. Treatment helped youth significantly lower their severity of drug abuse. Results of the Distress Scale score comparisons show that after treatment the youths had significantly less distress, anxiety and depression. Treatment helped the youths re-establish their emotional well-being. Positive treatment experience is demonstrated by Resistance Scale score comparisons. Youths became significantly more open and cooperative, and, less resistant. The Self-Esteem Scale pre-post comparison demonstrates that the youths significantly improved their perceived self-worth and value. Treatment helped youth positively change their self-esteem. Stress Coping Abilities Scale pre-post comparison indicates that the youths were better able to cope with stress after having been in treatment compared to what their coping skills were prior to treatment. **All of these pre-post scale comparisons demonstrated statistically significant differences (at the $p < .001$ level) between pretest and posttest scale scores.**

The Pre-Post Comparison Index is an outcome measure. It demonstrates that treatment outcome can be evaluated objectively. Pre-Post Inventory (PPI) scale scores are objective and accurate measures. The 30-day time referent in the PPI enables the same test to be administered again to the same youth at 30 day or longer intervals. Comparisons between pretest and posttest scores provide an objective and accurate way to compare scores.

PPI scale comparisons represent outcome criteria. Pretest scores are the standard or baseline for comparison. Prior history is eliminated from scale scores and the 30-day time referent enables us to use the same test at posttest. This procedure holds testing (and outcome) variables constant so that change in youth responses can be attributed to treatment programs. The Pre-Post Comparison Index table which is presented above demonstrates that Missouri Division of Youth Services treatment program is very effective.

PPI outcome measures are analyzed further by reviewing other scale and test item comparisons. Four comparisons are presented. These are; the "Here and Now 10-Point Recency Comparison," "Client Program Rating," "Self-Rating of Problems" and the "Structured Interview Pre-Post Comparisons."

The **Here and Now 10-Point Recency Comparison** looks at the difference between pretest and posttest for selected Alcohol, Drugs and Dangerousness test items. Items were chosen that were most representative of each set of problem behaviors. Answering these items positively is a direct admission of problems. There is a possible total of 10 points on each (Alcohol, Drugs and Dangerousness) scale. The higher the point total the higher the youth's problem severity. Again, the difference between pretest and posttest scores can be positive, zero or negative which signifies improvement, no change or did worse, respectively.

Pretest and posttest recency points for the 232 youths included in this analysis are presented in the following table. The mean or average 10-point recency score for each (Alcohol, Drugs and Dangerousness) scale are presented along with the pre-post difference. Pre-post differences for all three scales are statistically significant at the

p<0.001 level of significance. Youth's problem severity significantly decreased for all three scales.

Here and Now 10-Point Recency Comparison			
Measure	Pretest Mean Point	Posttest Mean Point	Pretest-Posttest Difference
Alcohol	3.19	2.12	1.17
Drugs	5.56	3.50	2.06
Dangerousness	1.56	0.97	0.59

For all three comparisons, youths, on average, had lower recency scores at posttest than at pretest. Youths significantly lowered their Alcohol severity scores. In other words, their drinking was less problematic after treatment. Similarly, the youths significantly reduced their drug abuse problem severity. And, youths became less dangerous after treatment. **Positive differences between pretest and posttest on these comparisons indicate that the youths benefited from program participation.** Treatment programs successfully reduced youths' problem severity. These results agree with the Pre-Post Scale Comparison Index and, again, attest to treatment effectiveness.

Client Program Ratings compare youths' pretest and posttest responses to six PPI test items that reflect the youths' assessment or opinions about the counseling or treatment program they have been involved in. The youths' responses to the six PPI items are presented in the table below. Percentages represent the number of youths (of the total 232) who responded true to these six items.

Pre-Post comparisons are made directly between the percentages of youths who responded "true at pretest" against the percentage of youths who responded "true at posttest." Higher percentages at posttest would indicate that youths rated their counseling or treatment programs favorably.

All six **Client Program Ratings** items demonstrate positive youth opinions about their counseling or treatment programs. 38.8% of the youths rated their alcohol programs (#142) as helping them greatly at posttest compared to 10.8% at pretest. Similar results are seen for drug problems (#143). Nearly three times the percentage of youths rated their counseling or treatment (#147) as excellent at posttest compared to pretest. Nearly three-fourths (72%) of the youths rated their counseling or treatment programs effective and worthwhile (#148). These results are consistent with the Pre-Post Scale Comparison Index results. **Most of the youths believed their treatment programs were helpful and effective and this is reflected in lower posttest scale scores.**

Pretest-posttest comparison percentages for questions with multiple choice answers show different outcomes for different response choices. Questions #142 and #143, for example, show that more youths chose the "helped greatly" response and fewer youths chose "helped very little." Similarly, more youths rated their treatment programs

excellent (#147) and fewer youths rated their programs below average. More youths rated their treatment programs positively and fewer youths rated them negatively.

Client Program Ratings (Six Items)		
Rating Item	Pretest %	Posttest %
#69. I believe there are people on the staff that can help me. .	83.6	90.9
#79. I like talking with a counselor or staff-member about my problems, concerns and future.	66.8	75.4
#142. Alcohol counseling or treatment has helped me:		
1. Greatly	10.8	38.8
2. Some	10.3	12.1
3. Very little	10.3	5.2
#143. Drug counseling or treatment has helped me:		
1. Greatly	14.7	49.1
2. Some	16.4	14.2
3. Very little	12.1	6.5
#147. Rate your last 30 days counseling and/or treatment experience:		
1. Excellent	21.6	59.1
2. Average	27.6	28.9
3. Below average	12.5	3.9
#148. Regarding program effectiveness, my most recent (last 30 days) counseling and/or treatment program has been:		
1. Effective and worthwhile	33.2	72.0
2. I am not sure (no opinion)	24.1	15.1
3. Not effective nor worthwhile	8.6	3.9

The **Self-Rating of Problems** comparisons involves four PPI test items concerning alcohol and drug use or abuse. In the table below, youths' responses to these items are presented in terms of the percentage of youths giving each response. Pretest-posttest comparisons were made directly from these percentages.

For PPI test items #15 and #74 a higher percentage of youths rated their alcohol and drugs severity in the low range at posttest (compared to pretest percentages). For items #136 and #137, adding the percentages for mild, moderate and serious problems together it can be seen that there are lower percentages of youths who indicated they had problems (compared to pretest percentages). These results indicate that fewer youth believed they had alcohol or drugs problems after participating in treatment. These results agree with the Pre-Post Comparison Index findings for the Alcohol and Drugs Scales. Youths believe their alcohol and drug severity was lower at posttest. **The Self-Rating of Problems pre-post comparisons show that treatment programs were successful in lowering youths' self-perception of problem severity for alcohol and drugs.**

Self-Rating of Problems (Four Items)		
Rating Item	Pretest %	Posttest %
#15. On a scale of one to ten, one being not drinking and ten drinking and abusing alcohol. I would rate myself two or less.	63.2	71.1
#74. On a scale of one to ten, one being drug free or clean and ten being actively using and abusing drugs. I would rate myself two or less.	56.5	81.0
#136. How would you describe your drug use?		
1. Serious problem.....	19.4	18.1
2. Moderate problem.....	13.8	13.4
3. Mild problem	24.6	20.3
#137. How would you describe your drinking?		
1. Serious problem	7.3	10.3
2. Moderate problem	10.3	7.8
3. Mild problem	19.0	13.4

The **Structured Interview Pre-Post Comparison** is similar to the Self-Ratings of Problems presented above. The youths' responses to the structured interview items (from 135 to 148) are compared in terms of the percentage of youths responding to each item. Pretest and posttest answer percentages are compared. Pre-Post comparison of these items provides insight into the youth's attitude, motivation and change.

Structured Interview Pre-Post Comparison results are presented in the following table. These 14 PPI test items are the last series of questions in the test and they all have 4-alternative multiple-choice answers. Most comparisons are straightforward. However, some may require reviewing the test item. For example, some questions ask youths to rate their problems. Youths would be expected to rate their problems lower after treatment. Their ratings of problems go down which results in lower percentages of problem ratings at posttest compared to pretest. Questions that pertain to change would have more youths giving "changed for the better" answers at posttest which would result in higher posttest percentages compared to pretest.

Structured Interview Pre-Post Comparison		
Item	Pretest %	Posttest %
#135. How would you describe you desire for counseling, treatment or help?		
1. Highly motivated (want help).....	49.1	61.2
2. Some motivation (undecided)	25.4	22.0
3. Little motivation (handle it myself).....	14.7	8.6

Structured Interview Pre-Post Comparison		
Item	Pretest %	Posttest %
#136. How would you describe your drug use?		
1. Serious problem.....	19.4	18.1
2. Moderate problem.....	13.8	13.4
3. Mild problem	24.6	20.3
#137. How would you describe your drinking?		
1. Serious problem.....	7.3	10.3
2. Moderate problem.....	10.3	7.8
3. Mild problem	19.0	13.4
#138. During the last month (30 days) I have had:		
1. Thoughts of harming myself.....	4.7	3.9
2. Thoughts of harming others	15.1	11.6
3. Both 1 and 2 (suicidal or homicidal thoughts)	6.5	3.9
#139. Rate your present level of distress (anxiety, depression and unhappiness) on a scale of one to ten. One represents no problems or concerns, whereas ten means you are desperate and overwhelmed.		
1. One or two (no problems)	31.0	44.0
2. Three, four or five (some problems).....	43.5	40.1
3. Six, seven or eight (lots of problems).....	13.8	7.3
4. Nine or ten (desperate and overwhelmed)	11.6	8.6
#140. During the last 30 days, my drinking problem has:		
1. Gotten worse	4.3	3.4
2. Stayed the same	8.2	3.9
3. Gotten better or improved	19.0	21.6
#141. During the last 30 days my drug problem has:		
1. Gotten worse	4.3	4.3
2. Stayed the same	9.1	3.9
3. Gotten better or improved	36.2	34.5
#142. Alcohol counseling or treatment has helped me:		
1. Greatly	10.8	38.8
2. Some	10.3	12.1
3. Very little	10.3	5.2
#143. Drug counseling or treatment has helped me:		
1. Greatly	14.7	49.1
2. Some	16.4	14.2
3. Very little	12.1	6.5
#144. How would you describe your desire to get (or continue in) alcohol treatment?		
1. Highly motivated (I want help).....	14.2	24.1
2. Moderately motivated (I may need help).....	10.8	12.1
3. Slightly motivated (maybe, not sure).....	12.1	9.5

Structured Interview Pre-Post Comparison		
Item	Pretest %	Posttest %
#145. How would you describe your desire to get (or continue in) drug treatment?		
1. Highly motivated (I want help).....	21.6	38.8
2. Moderately motivated (I may need help).....	17.7	12.9
3. Slightly motivated (maybe, not sure).....	16.4	9.5
#146. How would you describe your desire to get (or continue in) counseling, treatment or help for emotional or mental health problems?		
1. Highly motivated (I want help).....	23.3	35.3
2. Moderately motivated (I may need help).....	20.7	19.0
3. Slightly motivated (maybe, not sure).....	21.6	15.1
#147. Rate your last 30 days counseling and/or treatment experience:		
1. Excellent	21.6	59.1
2. Average	27.6	28.9
3. Below average	12.5	3.9
#148. Regarding program effectiveness, my most recent (last 30 days) counseling and/or treatment program has been:		
1. Effective and worthwhile	33.2	72.0
2. I am not sure (no opinion)	24.1	15.1
3. Not effective nor worthwhile	8.6	3.9

PPI items #135, #144, #145 and #146 concern youths desire for treatment help. All four items had higher percentages of youths who desired treatment help at posttest compared with pretest. Desire for treatment confirms that youths felt treatment was helpful and would like to continue in treatment.

For items #136, #137, #138, #139, #140, #141 youths rated their problem severity. Youths' answers at posttest indicated that their problem severity decreased. However, item #137, concerning drinking problem severity, had a higher percentage of youths rating their drinking as a serious problem. There may be several explanations of these findings. However, after treatment youth may be more aware of drinking "being problematic." Another very important finding is that fewer youths had suicidal and homicidal thoughts (#138) at posttest. At pretest 61 (26.3%) youths reported they were suicidal or homicidal, whereas only 45 (19.4%) youths had suicidal or homicidal thoughts at posttest. Missouri Division of Youth Services staff are certainly now in a position to follow-up with these troubled youth. These response percentages speak for themselves.

The percentage of youths who rated their treatment experience (#147) as excellent was nearly three times higher at posttest compared with pretest. And, more than twice the percentage of youths at posttest felt their treatment programs were worthwhile. Taken together these Structured Interview percentages demonstrate that most youths believe they benefited from their treatment involvement.

Summary

Pre-Post Inventory **outcome** analyses demonstrate that Missouri Division of Youth Services' treatment program reduced youths' problem severity. PPI outcome criteria (Truthfulness Scale, Alcohol Scale, Drugs Scale, Distress Scale, Resistance Scale, Self-Esteem Scale and Stress Coping Abilities Scale) all had significantly lower scores at posttest. Lower scale scores represent lower problem severity.

Further outcome analyses demonstrated that youths' ratings of their own problem severity were lower at posttest. And most youth felt that their treatment programs helped.

Assessing outcome can also be done on an individual basis to determine how effective a treatment program is for a specific youth. This is an important area for outcome research. It evaluates treatment program effectiveness while enabling staff to identify youth that still need help.

Outcome research will likely be emphasized in the U.S. in the coming decade. We can now accurately identify problem severity so that youths can be referred to appropriate treatment programs. Andrews, Bonta and Hoge noted that problem severity must match treatment intensity for maximum outcome effectiveness (Andrews, D.A., Bonta, J. & Hoge, R.D., 1990, Classification for effective rehabilitation: Rediscovering Psychology, Criminal Justice and Behavior, 17, 19-52.). Andrews et al. (1990) reviewed literature that showed clients with identified problems benefited most from having been placed in high level intervention programs while lower risk cases did as well or better with low intensity intervention and treatment programs. This "matching" intervention and risk levels can only happen with accurate tests and outcome measures. The PPI automates identification of treatment severity need and outcome assessment. Pre-Post comparisons are automatically generated by the PPI software, saving staff time and resources.

Three Groups of PPI Data

The Pre-Post Inventory (PPI) was administered to a total of **1,235** Missouri Division of Youth Services clients. **758** youths only took the pretest, **245** youths only took the posttest and **232** youths completed both the pretest and posttest. These **232** youths contributed to the outcome analyses presented above. There are a total number of **990** pretests and **477** posttests that were administered to troubled youth.

The larger number of pretest data could be due to a number of reasons. Youths still in the program have not been given the posttest. Other youths may have been transferred, dropped out or for whatever reason, were not given the posttest. In addition, some

youths were in the program prior to the start of PPI testing and were given the posttest, but, they did not take the pretest.

The following section presents PPI accuracy, reliability and validity analyses for the **990** youths (758+232) who had pretest results. There are no pre-post comparisons because only pretest results are summarized. The pretest assesses youths at intake or when they enter treatment. Pretest results set the standard or baseline for subsequent posttest comparisons. Posttest results alone are not included because they are summarized in the above Pre-Post outcome analyses. Demographic information for the youths who completed the pretest and for the youths who completed the posttest are presented separately in the Appendix.

Pre-Post Inventory Accuracy, Reliability and Validity N = 990 Pretests

The purpose of screening is to accurately identify problems and their severity. The Pre-Post Inventory (PPI) helps evaluators screen youths who have serious problems so that those youths can be helped. The Pre-Post Inventory (PPI) assists evaluators in selecting appropriate levels of intervention, counseling and treatment alternatives. The PPI evaluates the youths' test taking attitude and identifies attempts to "fake good." It also assesses substance (alcohol and other drugs) abuse, distress, resistant attitudes, self-esteem and the youth's ability to cope with stress. **Client confidentiality and HIPPA compliance are assured with the PPI's proprietary "delete names" procedure.**

PPI screening results are easy to interpret and permit a straightforward system for classifying youth risk. PPI scale scores are presented as percentiles that range from zero to 100. The PPI has four risk categories, low (0-39%), medium (40-69%), problem (70-89%), and severe problem (90-100%). Each category represents a level of risk that suggests different levels of intervention/treatment. The predicted percentages for each risk range are; **low risk** (39%), **medium risk** (30%), **problem risk** (20%) and **severe problem risk** (11%). A problem is not identified until a youth's scale score is at or above the 70th percentile. Screening filters out youths with problems while identifying and determining the severity of their problems.

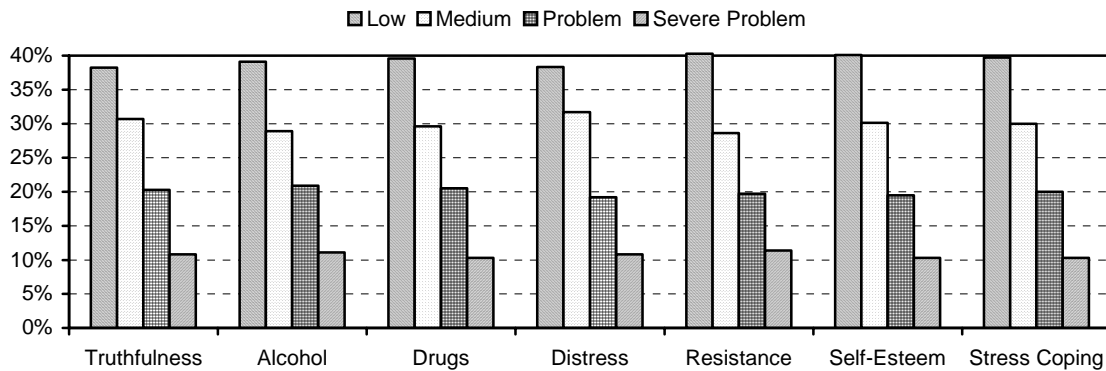
In the following PPI analyses only Pretest test results are presented. There are no pretest-posttest comparisons. The Pretest is administered at intake, prior to treatment, so it assesses youths' status "going in." The Posttest, however, is influenced by treatment program participation. There are **990** youths' Pretest results presented in these analyses. There were 883 (89.2%) males and 107 (10.8%) females. The majority of the youths were 15 or 16 years of the ages. Demographic information for these youths is presented in the Appendix.

PPI Accuracy

Many studies have been conducted on PPI scales that included thousands of youths. The PPI is accurate for demographic groups like age, gender and ethnicity. The PPI has been standardized on males and females, three ethnic groups (Caucasians, Blacks and Hispanics) and geographic (state-by-state) regions.

PPI scale risk ranges (low, medium, problem and severe problem) are based on youths' answers to scale items. These "raw" scores are converted to percentile scores to make scale score interpretation easier. Risk range percentile scores are presented in the following graph and table. Predicted percentages are shown in the top row of the table in bold print. Youths' attained percentages are presented in the columns under these predicted scale percentages. Each PPI scale is represented. The difference between "predicted" and "attained" percentages are presented in parentheses (in bold type). Small differences between predicted and attained percentages mean the scale is accurate.

Pretest Scale Risk Range Accuracy (N = 990)



Pretest Scale	Low Risk (39% predicted)	Medium Risk (30% predicted)	Problem Risk (20% predicted)	Severe Problem (11% predicted)
Truthfulness	38.2 (0.8)	30.7 (0.7)	20.3 (0.7)	10.8 (0.2)
Alcohol	39.1 (0.1)	28.9 (1.1)	20.9 (0.9)	11.1 (0.1)
Drugs	39.6 (0.6)	29.6 (0.4)	20.5 (0.5)	10.3 (0.7)
Distress	38.3 (0.7)	31.7 (1.7)	19.2 (0.8)	10.8 (0.2)
Resistance	40.3 (1.3)	28.6 (1.4)	19.7 (0.3)	11.4 (0.4)
Self-esteem	40.1 (1.1)	30.1 (0.1)	19.5 (0.5)	10.3 (0.7)
Stress Coping	39.7 (0.7)	30.0 (0.0)	20.0 (0.0)	10.3 (0.7)

Looking at the Low Risk column, it can be seen that all PPI scale scores are within 1.3 percent of their predicted 39%. Medium Risk scores are within 1.7 percent of their predicted 30%. Similarly, Problem Risk scores are within 0.9 percent of their predicted 20%. And, Severe Problem Risk scores are within 0.7 percent of their predicted 11%.

All youth-attained risk range percentages are within 1.7 percentage points of the predicted percentages. Indeed, most predicted-attained percentage differences are less than one percent. The small differences between attained percentages

and predicted percentages support PPI scale accuracy. It seems reasonable to conclude that youths' scores are 99% accurate.

PPI Reliability

Reliability is synonymous with reproducibility. A test that is reliable will result in similar scores for a respondent time and time again. This is possible only when youths follow a definite pattern of responding. Consistency is another way to think of reliability. Youths answer test items consistently, either indicating they have a problem, no problem or something in between. The most common reliability statistic is coefficient alpha. Coefficient alpha varies from 0 for random responding or no reliability to 1 for perfect reliability. PPI scale reliability is presented in the table below. All PPI scales have high reliability coefficients which further demonstrates that PPI scales are accurate.

PPI Reliability Coefficient Alphas		
PRE-POST SCALES	Pretest Alphas	Significance Level
Truthfulness Scale	.86	p<.001
Alcohol Scale	.86	p<.001
Drugs Scale	.87	p<.001
Distress Scale	.85	p<.001
Resistance Scale	.83	p<.001
Self-Esteem Scale	.91	p<.001
Stress Coping Abilities	.89	p<.001

The professionally accepted standard for acceptable reliability is .80 or higher.

PPI Validity

Test validity means that test scores measure what they purport to measure. For example, Alcohol Scale scores identify problem prone drinkers and Drugs Scale scores identify drug abusers. Validating tests is often done by correlating a test with a "criterion." The criterion is often another test that measures the same thing and has been previously validated. This type of validation has been conducted in several studies on PPI scales. Criterion measures used in these studies include the Minnesota Multiphasic Personality Inventory (MMPI) L and F Scales, 16PF, Mortimer-Filkins test, MAST, MacAndrews Scale, ACDI-Corrections Version II, DVI-Juvenile, TII-Juvenile, experienced staff ratings and polygraph tests. These and other reliability studies are presented in the "PPI: An Inventory of Scientific Findings" which can be provided upon request.

The PPI test database enables using another unique validation procedure. PPI scale scores can be compared between two groups of clients, those who admit having problems and those who do not. Youths who admit having problems are expected to score at or above the 70th percentile (problem risk range) on PPI scales. In this validation procedure, a high percentage (above 90%) of youths admitting problems and scoring at or above the 70th percentile on PPI scales would support PPI validity.

This validity analysis compared Low Risk (zero to 39th percentile) and High Risk (70th to 100th percentile) client groups. It was expected that youths admitting to drinking problems would score at or above the 70th percentile on the Alcohol Scale. Those youths admitting to drug problems would score at or above the 70th percentile on the Drugs Scale.

PPI validity results demonstrate that Alcohol Scale scores accurately identified **95.4 percent** of the youths who admitted having drinking problems. Nearly all of the youths who admitted having drinking problems scored in the problem range on the Alcohol Scale. Similarly, the Drugs Scale identified **93.2 percent** of the youths who admitted having drug problems.

This unique database analysis was used because administering criterion tests to youths in everyday assessment settings is not practical. The amount of time required to administer and score several tests is often prohibitive. This innovative “admission-problem score” is admittedly limited because of problem minimization and denial. However, the Truthfulness Scale score identifies much of this denial and problem minimization. Consequently, test data was included in this analysis when the Truthfulness Scale score was at or below the 89th percentile. This procedure keeps the number of false positives to a minimum as invalid (untruthful) test data was excluded. The reliability, validity and accuracy of the Truthfulness Scale is discussed in the “PPI: An Inventory of Scientific Findings” document which can be provided upon request. And this predictive validity methodology enables evaluating PPI database scale scores on an ongoing basis.

Conclusion

Assessment accuracy is two fold. On the one hand, a test is accurate if the scales in the test are accurate, reliable and valid. This has been demonstrated with the PPI. On the other hand, test accuracy is reflected in the scales or measures that make up the test. When assessing treatment outcome, scales must be accepted as appropriate outcome criteria, that is, they must be capable of measuring client change in counseling and treatment settings. Pre-Post Inventory (PPI) scales or measures demonstrated that Missouri Division of Youth Services clients had significantly lower posttest scores compared to their pretest scores. Lower posttest scores mean that youths’ level of problem severity was lower after having been in treatment.

Earlier the PPI was shown to be an accurate assessment instrument or test. Classifying youth risk with PPI scales was empirically demonstrated to be around 98% accurate.

Scale scores are accurate representations of client risk. Youths who admit having drinking and drug problems are identified by their Alcohol and Drugs Scale scores. Youths who score at or above the 70th percentile on PPI scales have identifiable problems. This was empirically demonstrated. Nearly all of the youths who admitted having alcohol and drug problems scored in the problem risk (70th percentile and above) range on the PPI Alcohol and Drugs Scales. Finally, PPI scales' reliability coefficients are well above the professionally accepted standard for test reliability. Reliability coefficients were discussed earlier.

The Pre-Post Inventory (PPI) "Pretest" accurately screens youths with problems. Identifying youths with problems is the first step in placing youths into appropriate intervention and treatment programs. Matching youths' problem severity with appropriate levels of intervention and treatment can maximize treatment program effectiveness. PPI screening results assist staff in understanding each youth's needs.

Several pretest-posttest comparisons were presented in this report that demonstrate youths improved at posttest from where they were at pretest. The Pre-Post Inventory was designed to measure client change (outcome) and directly assess treatment effectiveness. Measuring change (outcome) is possible because the Posttest is identical to the Pretest. The pretest is the standard against which the posttest is compared. One of the PPI strengths is in the objective way it assesses pretest-posttest outcome or change. The PPI quantifies the amount of change clients undergo during treatment. This enables staff to assess the effectiveness of these programs. Missouri Division of Youth Service's treatment programs were effective in bringing about positive change in their clients.



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Appendix

Pretest Client Demographics

Population				
Males		Females		Total
N	%	N	%	N
883	89.2	107	10.8	990

Race/Ethnicity				
Race	Males	Females	Total	
	N	N	N	%
Caucasian	590	74	664	67.1
Black	253	29	282	28.5
Hispanic	24	3	27	2.7
Native American	5	0	5	0.5
Other	11	1	12	1.2

Education				
Grade	Males	Females	Total	
	N	N	N	%
7 th Grade or Less	163	22	185	19.7
8 th Grade	321	28	349	37.3
9 th Grade	254	37	291	31.1
10 th Grade	76	12	88	9.4
11 th Grade	18	4	22	2.4
HS Graduate	1	0	1	0.1

Posttest Client Demographics

Population				
Males		Females		Total
N	%	N	%	N
426	89.3	51	10.7	477

Race/Ethnicity				
Race	Males	Females	Total	
	N	N	N	%
Caucasian	275	36	311	65.2
Black	143	13	156	32.7
Hispanic	4	2	6	1.3
Native American	0	0	0	0.0
Other	4	0	4	0.8

Education				
Grade	Males	Females	Total	
	N	N	N	%
7 th Grade or Less	34	5	39	8.2
8 th Grade	118	16	134	28.1
9 th Grade	156	13	169	35.4
10 th Grade	87	9	96	20.1
11 th Grade	19	4	23	4.8
HS Graduate	12	4	16	3.4

Age Group - Pretest				
Age	Males	Females	Total	
	N	N	N	%
10 & Under	1	0	1	0.1
11	1	0	1	0.1
12	11	1	12	1.2
13	51	7	58	5.9
14	128	18	146	14.7
15	240	35	275	27.8
16	368	42	410	41.4
17	83	4	87	8.8
18	0	0	0	0.0
19 or Over	0	0	0	0.0

Age Group - Posttest				
Age	Males	Females	Total	
	N	N	N	%
10 & Under	0	0	0	0.0
11	0	0	0	0.0
12	0	0	0	0.0
13	11	0	11	2.3
14	35	6	41	8.6
15	90	14	104	21.8
16	160	18	178	37.3
17	130	13	143	30.0
18	0	0	0	0.0
19 or Over	0	0	0	0.0

Report Highlights

Pre-Post Inventory Outcome Analyses reveal the following findings.

- All seven Pre-Post Inventory scales had significantly lower scores at posttest compared to pretest. This means that youths benefited from treatment participation.
- Nearly three-fourths (72%) of the youths rated their counseling or treatment programs as “effective” and “worthwhile.”
- 71.1% of the youths rated their drinking as low risk, up from 63.2% at pretest.
- 81% rated their drug use as low risk, up from 56.5% at pretest.