

YouthZone

YouthZone Screening for Positive Youth Development®

Psychometric Analysis for Reliability and Validity

Individualizing Youth Services and the YouthZone Survey

Across Colorado, each day young people are referred by schools, probation departments, courts, and social agencies for youth services that will restore their positive development, educational achievement, and social adjustment. Intake case managers are challenged to individualize plans that will meet youth and community needs while considering client age, gender, and ethnic diversity, a wide range of family types, and referring problems of varying severity, and doing so within available resources. At YouthZone, case manager's training and experience with planning services are supplemented by information from the *YouthZone Screening for Positive Youth Development*®. The "Survey" is a screening tool. Its sole purpose is adding information to the case manager's planning process. It is not a behavioral health or diagnostic assessment, though the case manager may refer a client for a behavioral health evaluation in part because of information from Survey screening.

The Survey has been developed, reliability and validity established, updated, and reviewed in its field application through independent evaluation consultation. Survey content has changed through staff reviews during which key topics that would assist case managers with planning have been recommended. Topics have been retained or rejected after trials with new clients. Answer options have been revised through the same process. Tri-annual program evaluations of YouthZone services have analyzed the psychometric (statistical) qualities of revisions. This technical report summarizes findings from the most recent analysis of the Survey scoring, reliability, and predictive utility.

Fig. 1 YouthZone Youth Survey

Content

Covers a wide range of topics (assets and risk behaviors) important to case managers planning individualized services

Length

Contains 60 questions, 7 are identifying and demographic, two ask the youth to assess the quality of their survey taking, and 51 inquire about their assets and risks.

Reading Level

7th-grade

Time to Complete

15-minutes

Theoretical Foundation

Evaluation consultation used the Positive Youth Development theory as its guideline for the technical development of the Survey. This theory is endorsed by the Office of the Assistant Secretary for Planning and Evaluation of the U.S. Department of Health and Human Services. (The ASPE is the principal advisor to the Secretary of the U.S. Department of Health and Human Services on policy development, and is responsible for major activities in policy coordination, legislation development,

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strategic planning, policy research, evaluation, and economic analysis. The theory is presented at <http://aspe.hhs.gov/hsp/positivelyouthdev99/chapter1.htm>. The theory states that “Youth development practitioners, the policy community, and prevention scientists have reached the same conclusions about promoting better outcomes for youth. They call for expanding programs beyond a single problem behavior focus, and considering program effects on a range of positive and problem behaviors. Prevention science provides empirical support for this position through substantial evidence that many youth outcomes are affected by the same risk and protective factors.”

The Survey contains items that capture youth risk and protective factors and through technical development, these items are scored and interpreted in a format alerting case managers to problematic issues and those assets on which support can be built for the youth and family.

Administration and Scoring

Youth complete the Survey online at intake and again at the time of discharge, using a secure database. Two validity scales ask the youth if they have understood the questions and if they have answered honestly. Software scores the survey on five scales and delivers to the youth’s case manager scale results with interpretations and guidelines or recommendations for intervention.

Survey Scales

Repeated psychometric analysis of the Survey with new client samples has found a small number of scales accurately capture youth responses to the 51 asset and risk questions. Thus, when a client reports a low level of marijuana use, most also report equally low levels of other drug use. Statistical analysis (Principal Component analysis) collects items that youths tend to answer in the same way and compiles them into a scale. Scales are named according to the included questions. The 51 Survey items for 751 intake-screened youth are represented by five scales, shown in Fig. 2.

Survey scoring software prints an individualized interpretation for each youth, providing best-practice recommendations to case managers on combining information from various sources for intervention.

Fig. 2 YouthZone Youth Survey Scales

Alcohol, Tobacco, and Other Drug Use

Measures the youth’s frequency of substance use, including prescription medication, the potential harm of use, risk behaviors closely associated with extent of use (sexual activity and contact with police), and peer use of substances ($\alpha = .869$)

Optimism and Problem Solving

Measures the youth’s positive value of themselves, optimism about their future, and report of important skills for solving problems and in setting and achieving goals for their future ($\alpha = .816$)

School and Community Involvement

Measures the youth’s commitment to achieving in school, attendance, grades, and satisfaction with school, as well as their involvement in non-academic activities in school and the community ($\alpha = .741$)

Delinquency and Aggression

Measures the youth’s antisocial outlook toward rules and other people, as well as their readiness to engage in verbal and physical conflict and tolerance of use of frankly dangerous substances, e.g., huffing and using illicitly obtained medication ($\alpha = .701$)

Self-Deprecation

Measures the youth’s perception of themselves as a victim of verbal, physical, and sexual abuse, tolerance of substance use, and thoughts and plans to attempt suicide ($\alpha = .732$)

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Rarely, less than 2 percent of Survey administrations, a youth will attempt to minimize their risk behaviors to a significant degree. The printed validity score alerts the case manager to the possibility of an invalid Survey.

Survey Scale Reliability

Calculation of scale reliability (Cronbach's alpha) found that internal consistency was in the acceptable range of .70 or greater. Scale reliabilities for 751 intake-screened youth are shown in the above figure.

Survey Validity: Sensitivity to Pre-to-Post Program Intervention

Survey validity was determined through four statistical studies. First is the Survey's capacity to reflect anticipated improvement's in youths who have participated conscientiously in YouthZone services over a specified length of time. Sensitivity to client change is essential to Survey use in individualizing treatment plans.

For 678 youth with valid pre- and post-intervention surveys and who were in traditional YouthZone programs, four of five scales showed significant improvement. Client reports of substance use declined (Repeated measures ANOVA, $F_{pre-post} = 18.202$, $p < .000$). Optimism and Problem Solving gained dramatically over the intervention period ($F_{pre-post} = 117.250$, $p < .000$). Also improved were topics measured by School and Community Involvement ($F_{pre-post} = 34.311$, $p < .000$). Antisocial attitudes and actions captured in the Delinquency and Aggression scale declined also among served youth ($F_{pre-post} = 124.574$, $p < .000$). The Self-Deprecation scale, which measures client history of abuse and past substance use and suicidal concerns was, as expected, unchanged during intervention ($F_{pre-post} = .007$, $p < .934$). These analyses show that its sensitivity to changes with YouthZone programs qualifies the Survey as a valid tool for screening new clients in consideration of their likely response to intervention.

Survey Validity: Sensitivity to Program Discharge-to-Six Months Follow-up

Survey validity was determined also by its capacity to measure changes in clients' assets and risk factors from completion of the Survey at the time of their discharge from YouthZone services and six-months later. In 2009, a representative sample of 100 youth clients was enrolled in a six-month follow-up study. Of these, 93 completed the post-discharge review and a post-discharge Survey administration. A repeated measures analysis of variance found that on all Survey scales youth were significantly improved include a reduction in the Self-Deprecation scale that taps feelings of victimization and suicidal thinking.

This analysis shows that the Survey is valid for not only capturing intake-to-discharge program benefits, but will also reveal youth improvement in the months following program discharge.

Survey Validity–Predicting Short-term Recidivism

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The third validity method determined whether the Survey could anticipate at youth intake whether the client would complete their program without reoffending. In this validity study, intake Surveys and re-offense data (“Did not reoffend” or “Did reoffend”) were available for 916 youths. In this sample, 98 (10.7%) failed to complete their service program before reoffending. Analysis of variance found that on all five Survey scales, reoffending youth had poorer scores than their sister and brother clients who did not reoffend. To determine the most influential scales in predicting recidivism, a Logistic Regression was computed. Results demonstrated that intake scores on Survey scales Alcohol, Tobacco, and Other Drug Use and School and Community Involvement were the best statistically significant predictors of recidivism (Wald statistics = 8.949, $p < .003$ and 17.118, $p < .000$). The remaining three Survey scales did not improve the prediction accuracy beyond that provided by knowledge of a youth’s substance use and their school-community involvement.

Fig. 3 YouthZone Youth Survey

Identifying Vulnerable Youth for Formal Assessment

Suicide Risk

During the past 12 MONTHS, did you ever seriously consider suicide?

During the past 12 MONTHS, did you make a plan about how you would attempt suicide?

Abuse Risk

Has anyone ever touched you in a sexual way that you did not want?

I have been abused physically or verbally by an adult.

Have you ever had sexual contact with another person?

Separate Logistic Regression revealed that client gender (male) and family type (living with a single parent – mother or father) strengthened the Survey’s accuracy in identifying young people who were at risk of reoffending prior to program completion.

Survey Validity: Identifying Vulnerable Youth for Formal Assessment

The fourth validity method involved the utility of inspecting selected Survey items that could alert a case manager that the youth they were screening might require a behavioral health or other assessment. To explore this validity option, YouthZone staff selected five items identified because these may signal a need for further action. Items were extracted from valid intake Surveys obtained from 1,008 youths in diversion and similar YouthZone programs. Principal Component analysis revealed that youth responses to the five items could be classified into just two types, shown in Fig. 3.

The charts in Fig. 4-5, created from summing item scores on the two risk topics for 1,008 youth, demonstrate how the Survey screens for youth who report in their answers that they may need further attention and possibly clinical assessment.

About one-in-ten (10.03%) responded to the Survey by saying that at some time in the past year, they had thoughts of suicide and had considered a plan for carrying out these thoughts. Case manager intakes are assisted with the information that will prompt immediate inquiry and possible referral for further evaluation. In the same YouthZone sample, about one-in-five youth (20.93%) answered questions suggesting they may have been a victim of abuse, currently or at some time in the past.

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The validity of these risk-screening methods is further revealed in their relationships with other youth characteristics. Though unrelated to youths' age, girls were more likely to report information of concern about suicide (*Chi Square* $\chi^2 = 31.834$, $p < .000$) and abuse (*Chi Square* $\chi^2 = 29.557$, $p < .000$). Elevated risk scores of both types were related significantly to adverse scores on Survey scales,

Fig. 4 Percent of Youth with Suicide Risk

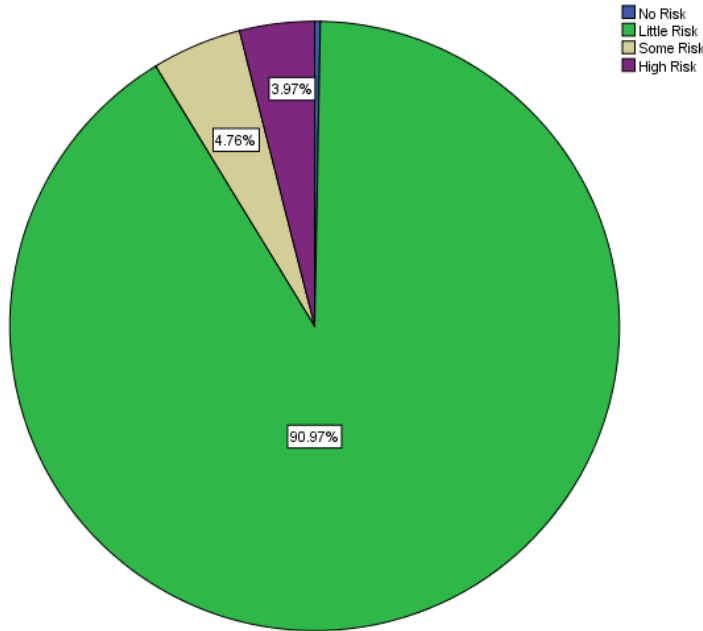
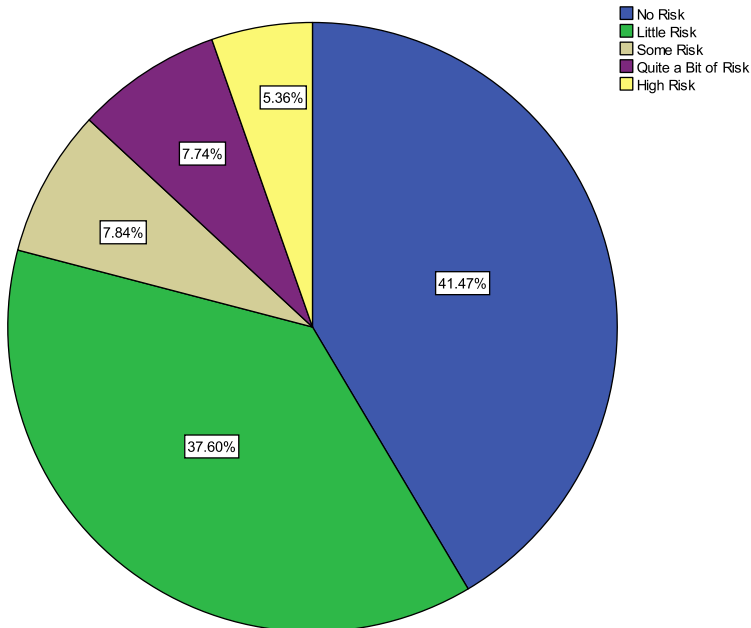


Fig. 5 Percent of Youth with Abuse Risk



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indicating greater substance use, lower optimism and problem solving, less school and community involvement and a greater tendency to exhibit antisocial attitudes (all Pearson r correlations $p < .01$).

Technical Glossary

Term	Definition
α	Alpha, the statistic measuring scale reliability (see Cronbach’s alpha)
χ^2	Chi-square, the statistic showing the value for a comparison of data in categories, e.g. male vs. female, that cannot be averaged for an analysis of variance
ANOVA	Analysis of variance, a method of comparing the differences among mean statistics to determine if these have occurred by chance or are statistically significant – repeated measures ANOVA, measuring the same clients over time and comparing the differences to determine if a trend in repeated measures is occurring
Assets	Developmental assets are the internal strengths on which youth draw to cope with adversity and use opportunities to their advantage
Behavioral health	Health care that views most client problems as best understood by considering social, emotional, physical, and behavioral factors and integrating these in treatment
Case manager	Person trained in the planning and coordination of services for youth
Chi-square	Statistical method for determining the probability that differences among categorized measures are statistically significant
Cronbach’s alpha	A statistic showing the extent to which survey respondents answered similar question in a similar way, a measure of internal consistency (see reliability)
F	The statistic showing the value of a comparison of means from a sample
Invalid survey	Youth respondent said they had trouble understanding the survey items, did not answer some questions honestly, or left 10% or more of the survey items unanswered
Logistic regression	A statistical method that determines which of a set of potential predictors of another variable have a high probability of forecasting the variable and of the potential predictors, which are most powerful
Pearson r	A statistic that shows the correlation or relationship between two sets of information about a client
Prediction	The capacity of an instrument to forecast a client’s response to intervention or their future behavior
Principal Component	Statistical analysis that uses mathematical procedures to identify groups of survey items on which respondents give similar answers and suggest within the respondents a “factor” or stable point of view about themselves and the world
Probability	Statistical probability (e.g., $p < .05$) shows the likelihood that an identified difference has occurred by chance, or is so infrequent ($.05 = 5$ chances out of 100) that it represents a true finding
Psychometric analysis	Methods for constructing and validating measurement instruments
Reliability	The consistency of a instrument in measuring a concept, assesses the consistency of respondents in answering similar items across a survey
Risks	Risk factors are external forces or characteristics of youth or their behavior that increase the possibility that they will experience further adversity
Sample	From a population or larger number of clients, a subset or group chosen for their common characteristics

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Term	Definition
Screening	Identifying characteristics of program participants and then filtering this information to identify issues of concern in program planning
Scale	A set of items from a survey that have been identified (e.g., through Principal Component analysis) to measure a closely related set of client characteristics
Survey	A method for collecting quantitative information from program participants
Validity	The extent to which a measurement is well-founded and corresponds accurately to other important issues relevant to the survey responders
Validity scales	Measurements within a survey that show respondent bias to exaggerate or minimize answers to give a more favorable appearance of their functioning
Wald statistic	The statistic that shows the probability of an individual predictor in a logistic regression

Reference

All statistical procedures described in this report followed recommended practices in the following reference:

Brace, N. Kemp, R. and Snelgar, R. (2009) *SPSS for Psychologists, 4th Ed.* New York: Routledge