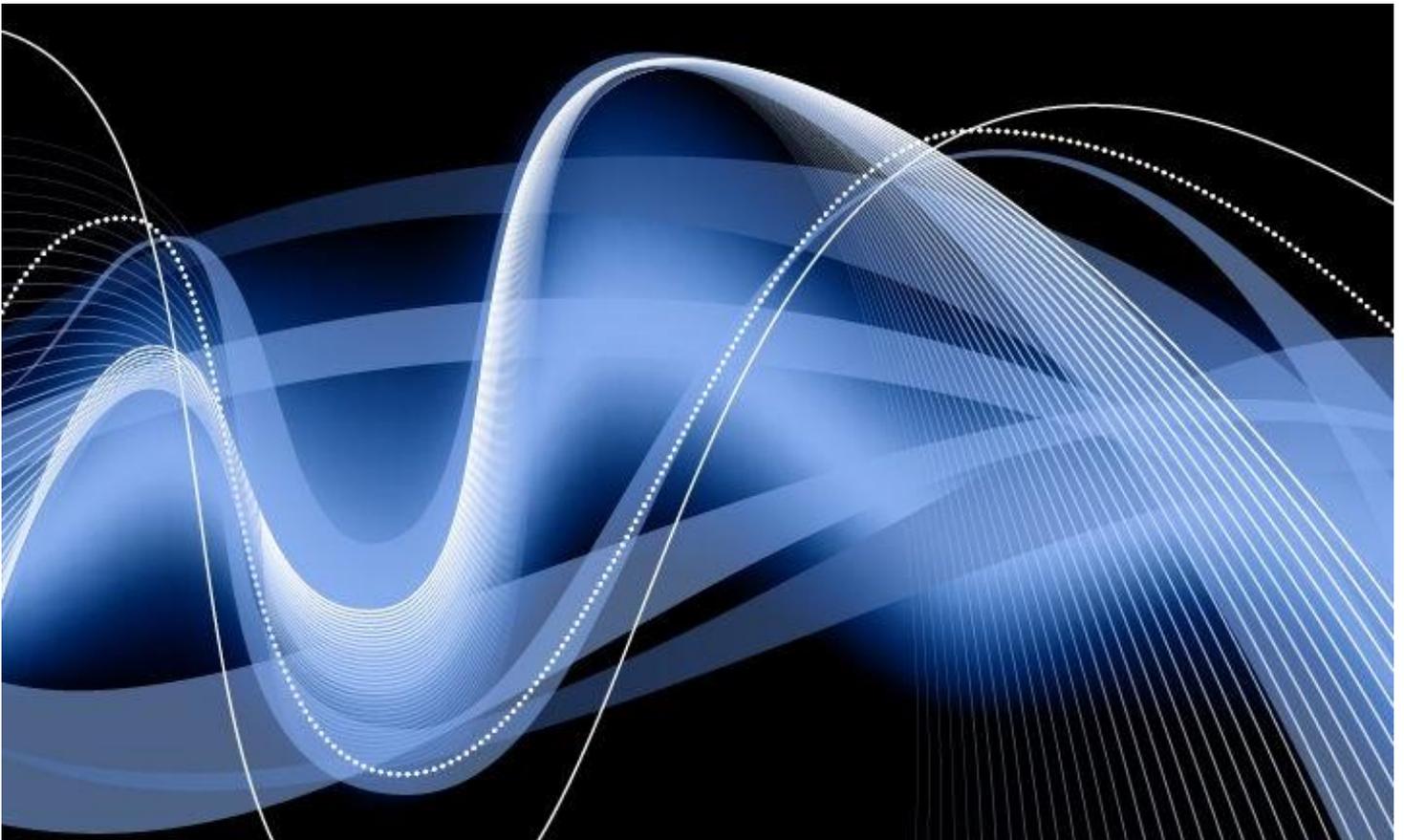


*Washington Assessment of the Risks and Needs of Students*

***WARNS***  
***TECHNICAL MANUAL***

*The Learning & Performance Research Center  
Washington State University  
Pullman*





## Acknowledgments

The Washington Assessment of the Risks and Needs of Students youth survey and all related products were made possible with the generous support of the John D. and Catherine T. MacArthur Foundation. As the lead entity for the Models for Change initiative in Washington State, the Center for Children and Youth Justice provided valuable assistance and guidance for the duration of this project

We are very grateful to the juvenile courts and other agencies who participated in the development, research, and implementation of the WARNS. These include Benton-Franklin Juvenile Court, Clark County Juvenile Court, Pierce County Juvenile Court, Spokane County Juvenile Court, Thurston County Juvenile Court, Educational Service District 101, and West Valley High School (Spokane).

We would like to acknowledge our appreciation for the individuals who worked to establish the reliability and validity of the WARNS and make the final revisions to this manual. These include Paul Strand and Brian French from Washington State University, Elizabeth Coker and Craig McBride from the University of Washington-Tacoma, Center for Strong Schools, and Carl McCurley of the Washington State Center for Court Research.

Finally, a very special thanks to Dr. Tom George, formerly of the Administrative Office of the Courts, who was instrumental in developing and piloting the WARNS and drafting the original user manual. Without his leadership this initiative would not have been possible. We are deeply indebted to Dr. George for his expertise and commitment to the WARNS project.

## Authorship

This manual has been adapted from the original manual produced by the Washington State Administrative Office of the Courts (AOC). Authorship of the original AOC manual is as follows:

**Dr. Thomas George**, Washington State Administrative Office of the Courts  
**Dr. Elizabeth Coker**, University of Washington-Tacoma, Center for Strong Schools  
**Dr. Brian French**, Washington State University  
**Dr. Paul Strand**, Washington State University  
**Dr. Chad Gotch**, Washington State University  
**Dr. Craig McBride**, University of Washington-Tacoma, Center for Strong Schools  
**Dr. Carl McCurley**, Washington State Center for Court Research

# Table of Contents

<b>Acknowledgments</b> .....	<b>1</b>
<b>Table of Contents</b> .....	<b>2</b>
<b>SECTION I. BACKGROUND ON WARNS</b> .....	<b>5</b>
Introduction .....	5
What is the WARNS?.....	5
Other WARNS items.....	6
Factors Affecting Data Validity.....	6
What are the Uses and Benefits of the WARNS?.....	7
Needs Assessment and Treatment Planning .....	7
Individual Progress Monitoring or Program Evaluation.....	8
Gaining Access to the WARNS .....	8
Registration.....	8
WARNS Reports .....	9
Ownership and Access to Data .....	9
Ethical and Legal Considerations .....	9
<b>WARNS Administration</b> .....	<b>11</b>
Overview .....	11
Legal reporting requirements .....	11
Preparation .....	12
<b>SECTION II. A PROFESSIONAL’S GUIDE TO INTERPRETING THE WARNS RESULTS</b> .....	<b>14</b>
WARNS Risk Scores .....	14
The Needs Scales .....	14
Levels of Need.....	14
THE SIX NEEDS SCALES.....	15
Needs Scale: Aggression-Defiance .....	15
Needs Scale: Depression-Anxiety.....	18
Needs Scale: Substance Abuse.....	20
Needs Scale: Peer Deviance .....	22
Needs Scale: Family Environment.....	24

Needs Scale: School Engagement .....	26
Other WARNS Items.....	30
Demographics .....	30
Family.....	30
School.....	30
Criminal History.....	31
Barriers to Attendance.....	31
Trauma.....	31
<b>SECTION III. A RESEARCHER’S GUIDE TO THE DEVELOPMENT, RELIABILITY AND VALIDITY OF THE WARNS.....</b>	<b>32</b>
Critical Concepts in Test Construction: Score Reliability and Validity .....	32
Previous Development Efforts .....	33
Early Pilot Studies.....	34
Validation Study Involving Truant Youth .....	34
Predictive Validity .....	35
2014 Item Review Information and Reliability .....	36
Internal Consistency Reliability.....	36
Concurrent Validity .....	37
Test-retest Score Reliability .....	38
Inter-rater Agreement .....	39
Validation Evidence .....	40
Internal Structure Evidence .....	40
Measurement Invariance and Issues of Fairness.....	42
Multi-group CFA.....	42
Known Group Differences.....	43
Classification Analysis .....	44
Ongoing Research .....	46
Summary of Test Reliability and Validation Evidence.....	46
<b>References .....</b>	<b>47</b>
<b>Appendices .....</b>	<b>51</b>
Appendix D. Range of Corrected Item-total Correlations.....	52
Appendix E: Results of initial Factor Analysis .....	53

Appendix F: Detailed results of 2009 ..... 55  
Appendix G: Analytic details ..... 56  
Appendix H. Inter-rater Reliability ..... 58  
Appendix I. Results of the Principal Components Analysis..... 59  
Appendix J. Internal Consistency ..... 60  
Appendix K. Results of the Principal Components Analysis..... 61

*Copyright © 2017 Washington State University  
Version 2.2*

## SECTION I. BACKGROUND ON WARNS

### Introduction

The Washington Assessment of the Risks and Needs of Students (WARNS) is a brief (53 to 74-item) self-report measure for 13 – 18 year-old youth designed to allow schools, courts, and youth service providers to assess individual risks and needs that may lead to truancy and/or school failure, and to target interventions accordingly. The WARNS takes approximately 10 to 30 minutes to administer, and measures both past and current experiences in several domains that are critical to healthy social, emotional, and educational development.

The WARNS is appropriate for use with juvenile status offenders, especially truant youth. It is also appropriate for use by school districts to provide early intervention services to students with poor attendance records. The WARNS can be administered online via remote access to a secure server located at Washington State University (WSU). The *Learning and Performance Research Center* (LPRC) at WSU has taken over administration of the WARNS from the *Washington State Center for Court Research* (WSCCR), a division of the Administrative Office of the Courts. The LPRC at WSU is responsible for overseeing all aspects of the administration and use of the WARNS.

This manual provides a technical overview of the WARNS instrument. Some information is also contained in the ***WARNS User Manual***. Section I of this manual provides an overview of the WARNS, Section II provides more detailed information on the different sections of the WARNS and how and why they were included in the instrument. Section II provides the information needed to accurately interpret WARNS reports and allow qualified practitioners to use this knowledge to provide appropriate interventions. Section III is targeted to researchers and others interested in the research base that established the reliability and validity of the WARNS for use with the populations of interest. Appendices are also included to provide additional information on the reliability and validity analysis.

### What is the WARNS?

All items on the WARNS provide valuable information that can assist youth service providers, administrators, researchers, and other stakeholders with understanding youths' past experiences and current functioning. However, six domains on the WARNS assess current needs that are related to truancy, delinquency, dropping out of school, and other maladaptive behaviors. The WARNS contains six Needs Scales, each consisting of between five and nine items each (40 items total). All six areas have been linked to truancy, delinquency, and/or dropping out of school (Hammond, Linton, Smink, & Drew, 2007; Howell, 2003; Loeber and Farrington, 1998). Scores on a scale are used to determine whether a youth has a *low*, *moderate*, or *high* need for intervention in that area. The six scales consist of the following:

- Aggression-Defiance
- Substance Abuse
- Family Environment
- Depression-Anxiety
- Peer Deviance
- School Engagement

Two of the scales assess a common distinction among types of behavior problems in childhood and adolescence: externalizing behaviors and internalizing behaviors. Externalizing behavior, measured by the Aggression-Defiance scale, refers to the tendency to act-out one's distress in an aggressive, irritable, and defiant manner. The Depression-Anxiety scale, on the other hand, assesses levels of internalizing behaviors, which tend to take the form of depression and anxiety, and may result in intense sadness, hopelessness, and sleeping and eating problems, among others (American Psychiatric Association, 2000).

A third Needs Scale screens for another problematic behavior: substance abuse. Substance abuse is an increasing problem among adolescents, especially marijuana use. Marijuana use has been linked to a number of school-related problems, especially truancy and dropping out of school (Henry & Huizinga, 2007; Henry et al., 2009). The Substance Abuse scale screens for the frequency of alcohol, marijuana, and "hard drug" use.

Three other needs scales assess a youth's functioning in three critical social contexts: peer relationships, the family environment, and the school environment. The Peer Deviance scale assesses a variety of problematic behaviors among the youth's friends such as criminal activity, drug use, truancy, and physical aggression. The Family Environment scale focuses on a youth's relationships with their parents and on characteristics of the home environment. The School Engagement scale assesses how much students like going to school, their engagement with the educational material, and their feelings of connectedness to teachers and staff.

### **Other WARNS items**

In addition to the items that compose the six Needs Scales, the WARNS contains a number of other items found to be strong predictors of truancy, delinquency, and dropping out of school in the research literature (Hammond et al., 2007; Howell, 2003; Loeber & Farrington, 1998). In addition, a few items can also be used to obtain a rough assessment of the validity of a student's responses (e.g., the number of reported arrests could be checked against official data). These items are organized by content domain on the WARNS Report. These items address basic demographic information, family functioning and organization, school attendance and engagement, criminal history, barriers to school attendance, and any history of trauma.

A number of other items related to the social, emotional, and educational development of students are included. Some were selected because of their general interest among stakeholders (e.g., experiences of being bullied, gang involvement), while others exist to determine if they can improve the reliability and validity of the Needs Scales (e.g., frequency of cigarette smoking for the Substance Abuse scale).

Three administration options are available with the WARNS, two of which include the "Other" WARNS items (the Full and Anonymous options). These items may not be appropriate for all testing situations, and agency administrators and survey administrators must carefully consider a number of factors before deciding whether or not to include them.

### **Factors Affecting Data Validity**

As a self-report instrument, a variety of factors can influence the validity of the youths' responses. Youth may over-report problematic behavior in order to receive attention or

services, or underreport behavior in order to avoid the same prospects. The latter may be especially likely in juvenile justice settings if the youth feels his or her responses may lead to current or future punitive actions. Youth may also answer questions in random fashion as an act of defiance or due to a lack of understanding. The WARNS survey does not have any built-in methods that attempt to assess the veracity of youths' responses. However, the WARNS Online does have a place at the end of the survey for administrators to indicate their impression of the validity of the responses based on how the youth behaved during the administration.

While one can never be certain that every respondent has answered as honestly and accurately as possible, a number of important considerations and actions can be taken to increase the likelihood of a hassle-free and valid administration.

## **What are the Uses and Benefits of the WARNS?**

### **Needs Assessment and Treatment Planning**

For counselors, case managers, and other individuals working with at-risk youth, the WARNS provides a method to quickly gather and synthesize important information about a youth's developmental experiences and current functioning. It is best used during the initial stages of engagement with the youth to better understand his or her specific risks and needs, guide conversations, and develop a successful intervention plan.

*The WARNS should not be used for diagnostic purposes or as the sole source of information in treatment planning, but instead as one of several strategies available to professionals to assist in identifying past and current challenges that may be negatively affecting school engagement and attendance.*

The WARNS is uniquely designed to allow professionals to prioritize services for those youth most at-risk for school failure, including drop-out. Scores on the six need scales can be used to match youth to targeted interventions. For example, less intense, group-level interventions may not be effective with high-risk students, but may be beneficial for those with moderate levels of need.

*As stated in the User Agreement, the WARNS may only be used in the best interest of the youth. It may not be used when considering or determining any punitive sanctions or to place students into certain educational classrooms or with a population of youth with similar results.*

For administrators, teachers, program managers, and others seeking to better understand the group of youth with whom they work, the WARNS can be administered in a group format to any number of students as long as the confidentiality of students' responses can be assured during and after administration. If a given site is interested in the aggregate results for a group of individuals, the LPRC at WSU can provide the site administrator with the individual-level data in Excel format for further analysis, including the development of a WARNS Site Report. Group reports may be of interest for specific populations (e.g., incoming freshman,

court-petitioned truants, treatment participants), or different groups of youth can be compared within a population (e.g., truants and non-truants; boys and girls; 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> graders).

### **Individual Progress Monitoring or Program Evaluation**

Individual service providers and stakeholders who are interested in whether or not their efforts were successful in bringing about meaningful change in the lives of youth may want to administer the WARNS both before and after an intervention. The WARNS was designed to measure recent changes in the perceptions and experiences of adolescents. All items on the six Needs Scales and several additional items inquire about youths' functioning during the past two months. Therefore, individuals and groups can be assessed both before and after most interventions to help determine if youth have improved in critical areas of development. Service providers or stakeholders interested in program evaluation are encouraged to contact the LPRC for help with research design and other issues necessary to a valid program evaluation.

## **Gaining Access to the WARNS**

### **Registration**

Courts, schools or other agencies interested in administering the WARNS may apply to use the instrument by completing and submitting a **WSU WARNS User Agreement** (See Appendix A). The User Agreement can be obtained by either contacting WSU at [WARNS@wsu.edu](mailto:WARNS@wsu.edu) or by using the version provided in Appendix A.

The User Agreement should be printed, filled out, signed, scanned and emailed to the Washington State University (WSU) at **WARNS@wsu.edu**. An individual with signing authority for the agency must sign the completed User Agreement. Any subsequent changes to the User Agreement, including the addition or modification of the list of qualified administrators who will have access to students' responses, may be requested by submitting a revised, signed User Agreement.

Any site or individual wanting to administer the WARNS must describe the purpose of its use, the population of youth who are to receive the survey, the approximate number of surveys to be administered, and the dates of administration. The individual or individuals responsible for interpreting the results of the WARNS for any purpose, including but not limited to evaluation or the provision of specific interventions, must be identified on the User Agreement and possess the appropriate qualifications. Qualified individuals include psychiatrists, clinical or counseling psychologists, certified school counselors, registered psychiatric nurses or nurse practitioners, social workers, or persons designated by a court as qualified to interpret risk assessments of court-involved youth.

Each site must designate a primary administrator to serve as the main source of communication with WARNS staff. The primary administrator is responsible for distributing all materials, instructions, codes, passwords, and results to other approved administrators. She or he is also responsible for informing others of the terms and conditions in the User Agreement

and ensuring the integrity of the WARNS survey and administration process. The primary administrator, and other administrators who will have access to students' responses, must be designated on the User Agreement.

Once the User Agreement is reviewed and approved, applicants will receive a notice of registration via email (usually within two weeks). At that time, users will receive the survey link, a set of access codes and passwords, a copy of appropriate parent and student consent forms, and other login and administration instructions. If the approved user requires a paper administration, they will be sent a printable copy of the WARNS via email.

## **WARNS Reports**

WARNS Online produces a detailed individual-level report immediately following the survey administration. The report contains the youth's identification number and demographics at the top of report. Next, the level of need is presented for each of the six Needs Scales. The levels of need (**Low**, **Moderate**, **High**) are color coded for quick and easy identification of the results. For the **Full** and **Needs Only** administration options, information from every item on the survey is also presented and organized by the content of the items, following the presentation of the Needs Scales scores. Upon request, WSU will send an Excel sheet of all the responses from a given site to the site administrator for further analyses such as aggregate reports.

## **Ownership and Access to Data**

The WARNS User Agreement specifies that all data resulting from either paper or online administration of the survey becomes co-owned by the signing agency and Washington State University. All submitted data are stored on secure servers at WSU raw format and are accessible only to approved staff of the *Learning and Performance Research Center* at WSU. Data may be used by the Center for research for further survey development or other research purposes at its own discretion and without notification to the submitting agency. The identity of submitting agencies will not be released in publications or to third-parties without the consent of the submitting agency. Submitting agencies may request in writing an extract of their own data. Data will be provided to the agency in an Excel sheet within approximately 30 days of the administration.

Respondent data will not be released to third-parties without prior written approval of the submitting agency unless otherwise directed by law. However, WSU may share aggregated results of data analyses to third-parties without prior approval so long as the results do not identify a specific school, school district, or agency. Users should keep in mind that open records laws in Washington State may require the release of data to third-parties without the approval of WSU or the submitting agency.

## **Ethical and Legal Considerations**

Guardian consent is not required when screening and assessment activities are being done in fulfillment of the law for doing a juvenile court filing for student truancy or as part of a

valid court order. Guardian and student consent should be obtained if doing a general screening of the student population. Consent forms have been developed for use by WSU and are available on our website at [WARNS.wsu.edu](http://WARNS.wsu.edu).

The WARNS contains questions of a personal nature, some of which may implicate the youth or others in possible crimes or other misdeeds (e.g., drug use by self or peers, truancy, physical assault, theft). The User Agreement specifies that the WARNS may only be used in the best interests of the youth, that is, to provide appropriate targeted interventions for truant youth. The use of the WARNS responses to impose punishment or sanctions or to implicate the youth in a crime, or interpreting a response as an admission of guilt would be a gross misuse of this instrument. ***Schools, courts, and other agencies should establish policies regarding the use and retention of student information prior to administration to safeguard the rights and welfare of every youth.*** Further, the youth should be fully informed as to how his or her information will and will not be used. The WARNS User Agreement also specifies that each administrator must understand and comply with all rules, requirements, and laws regarding the reporting of physical and sexual abuse.

Finally, consideration must be given to the requirements of the Family Educational Rights and Privacy Act (FERPA). If WARNS Reports are maintained by the school, they should be maintained separately from the students' educational records in order to avoid inappropriate and potentially damaging disclosure. Schools should consult with legal counsel when establishing policies regarding the retention of WARNS Reports.

# WARNS Administration

## Overview

The WARNS can be administered to an individual student or group of students in a variety of settings. As mentioned previously, most students can complete the WARNS in approximately 10-30 minutes, depending upon their level of concentration, reading and comprehension abilities.

Youth taking the WARNS should be allowed to complete the survey in a quiet, comfortable space free of distractions. The WARNS is currently available only in English, and is written at approximately a fifth-grade level. Some students may have difficulty reading or understanding certain words or phrases, therefore an administrator should remain nearby to answer any questions and to ensure appropriate use of the survey instrument. An administrator may also read the questions to students, although the students should be encouraged to answer independently if possible.

Individual youths may take the survey in succession on a single device or simultaneously on several devices. If conditions preclude access to the WARNS online, WSU can provide a pencil and paper version. In this case, the site administrator will need to enter the responses directly to the online site before the survey can be scored.

The WARNS can be administered by any individual at an approved site as long as those individuals do not access students' responses and a qualified administrator is available to address any issues that may arise. Administrators approved for viewing individual students' responses will be provided with a password to access the survey responses, which can be saved to a secure location.

The online survey can be administered using any web-enabled device. However, it is recommended that only devices with screens approximately 10 inches or larger be used for administration. Depending upon the type of device used for administration, formatting within the WARNS Report and the process of saving reports will vary. Administrators should become familiar with the device or devices to be used as well as the process for saving reports, if desired, to a secure drive or cloud-based storage service. When using the online WARNS, surveys are electronically scored and the results are available immediately to the survey administrator. Care should be taken to delete or secure survey results after administration to ensure student confidentiality.

## Legal reporting requirements

**An important consideration is any legal requirement for reporting information to authorities if administration of the WARNS reveals physical abuse of the youth.** The user should review and understand the laws surrounding the reporting of sexual or physical abuse to law enforcement. The user should also comply with any and all these rules, requirements, and laws and report to law enforcement any suspected abuse based on a Respondent's answers. In addition, survey administrators should prepare for emotional reactions to the questions by the youth. Mental health professionals should be made available in case of strong emotional

reactions to the questions or as a follow-up resource. Finally, the survey administrator should possess the necessary interpersonal skills and knowledge to appropriately handle youths' responses to these items and to refer them to mental health resources if necessary.

## Preparation

1. *Inform guardians and obtain parental and student consent unless performing the assessment in fulfillment of the law for a Juvenile Court filing for truancy.*

It is the responsibility of the approved agency and administrators to obtain consent from the youth and their parent or legal guardian prior to administration unless the assessment is part of a valid court order or in fulfillment of the law. The parent and student consent forms are available at [WARNS.wsu.edu](http://WARNS.wsu.edu).

The WARNS User Agreement specifies that under most circumstances, completing the survey must be voluntary on the part of the youth, unless required by a valid court order. If a student decides he or she does not want to take the survey or answer a question that requires a response, simply terminate the survey. Informing students of their rights, explaining how their information will be used, and enlisting their cooperation are critical steps toward ensuring data validity.

2. *Consider the students' abilities*

- Do the students have at least fifth-grade English reading and comprehension abilities?
- Does the student have the visual ability to read the text on the paper survey or the screen of devices to be used (e.g., laptops, tablets)?
- Does the student have the manual dexterity to accurately answer questions on all devices or paper?

3. *Choose and prepare a mode of online access*

- Where will administration occur (e.g., in the field, a set location, or does it vary)?
- Does the environment have a reliable internet connection? If using a wireless device, does the type of connection (e.g., wi-fi or cellular) match the device's capabilities?
- Is the battery life of the device suitable for administrations in the field, and is the device charged and ready for use?
- Can you easily save the WARNS Reports, if desired? Do you have a storage device or have you established an account for cloud-based storage? Is the process secure?

- Is the WARNS survey link easily accessible on every device to be used?
- Have you tested the device and taken a sample survey?

4. *Have the necessary information ready*

- Do you have your User ID?
- Do you have the login password?
- Do you have your Administrator's Code?
- Do you know your site's administration option?
- Do you have the WARNS Report password (if applicable)?

5. *Survey Environment*

- Is the environment quiet, comfortable, and free of distractions?
- Is there a reliable internet connection?
- Is the battery life adequate, or are a power cord and power source available?
- Can the youth enter responses privately?
- Are resources available to answer youths' questions and respond to issues?

## SECTION II. A PROFESSIONAL'S GUIDE TO INTERPRETING THE WARNS RESULTS

### WARNS Risk Scores

WARNS risk equations, scores, and categories have been developed to assess risk for delinquency<sup>1</sup> over one-year and two-year periods from the date of administration. Scoring and classification should not be used for other populations of students given that the equations, classification, and predictive accuracy would undoubtedly vary.

### The Needs Scales

All of the items that compose the Needs Scales are measured on a four-point Likert-style rating scale indicating the frequency of the thought, behavior, or emotion during the previous two months. The responses are as follows:

- *Never or hardly ever*
- *Sometimes*
- *Often*
- *Always or almost always*

Each item on a scale receives a score from zero to three. Higher scores reflect more problematic functioning. Most items are written with reference to a problem behavior (e.g., *I got into physical fights*), though some assess positive feelings (e.g., *I felt close to my parents*) and are therefore reverse scored. Scores are then summed across all items for each of the scales.

### Levels of Need

Scores for each of the Needs Scales are categorized into one of three needs levels: Low, Moderate, or High need for intervention. Several early studies (discussed in detail in Section III) were conducted to determine the reliability and validity of the six needs scales and the accuracy of the WARNS in predicating truancy and distinguishing between youth with and without histories of truancy. The cut-points for each scale were determined by clinical judgment and through consideration of the score distributions of different groups of youth included in the study (e.g., high school students, truants, offenders). The percentages of youth falling into three levels of need were also compared to the percentages of youth at varying risk/need levels found with other common screening and assessment instruments. Cut-points vary across the Needs Scales. Several examples of patterns of responses for each scale and how

---

<sup>1</sup> *Risk for delinquency* was defined as the probability of a court referral for an At-Risk Youth petition or a Truancy petition.

they correspond to different levels of need are presented below to provide professionals with the knowledge users to interpret the results for each of the needs scales.

## THE SIX NEEDS SCALES

### Needs Scale: Aggression-Defiance (8 items)

The Aggression-Defiance scale is composed of eight items that assess the frequency of youths' externalizing, acting-out behaviors during the previous two months. Five items assess aggression and three assess defiant behavior. The five aggression items measure destructive aggression towards people or property. These behaviors, even when relatively infrequent, are a significant and serious concern. They also tend to be strong predictors of current and future problematic functioning (Loeber & Farrington, 1998). Therefore, *sometimes* engaging in all of the aggressive behaviors, even without being defiant, is enough to warrant at least a moderate need for further evaluation and treatment. The aggression items assess physical fighting, threatening, bullying, and losing one's temper when angry. The items are:

- 2. I got into physical fights
- 7. I lost my temper and hit or yelled at something
- 24. I threatened to hurt someone
- 36. I picked on or bullied other kids
- 41. I got so angry I hit or broke something

Individuals who are aggressive also tend to act-out by defying authority, breaking rules, and lying to others. However, not all individuals with externalizing behavior problems are aggressive. Some youth in need of intervention tend to engage in problematic defiant and oppositional behavior characterized by disobedience, stealing, and/or damaging property. Three items on the Aggression-Defiance scale measure these behaviors. Because these behaviors can be considered relatively common in adolescence when they occur infrequently and in the absence of aggression, youth who report that they engage in defiant behavior only *sometimes* but do not report aggressive behavior are categorized as having a low need for intervention. However, if youth report that they *often* engage in defiant behavior, scores will reflect a moderate or high need for intervention depending on the co-occurrence of aggression. The three defiance items are:

- 27. I lied, disobeyed, or talked back to adults
- 43. I lied, hustled, or conned someone to get what I wanted
- 45. I damaged or stole something on purpose

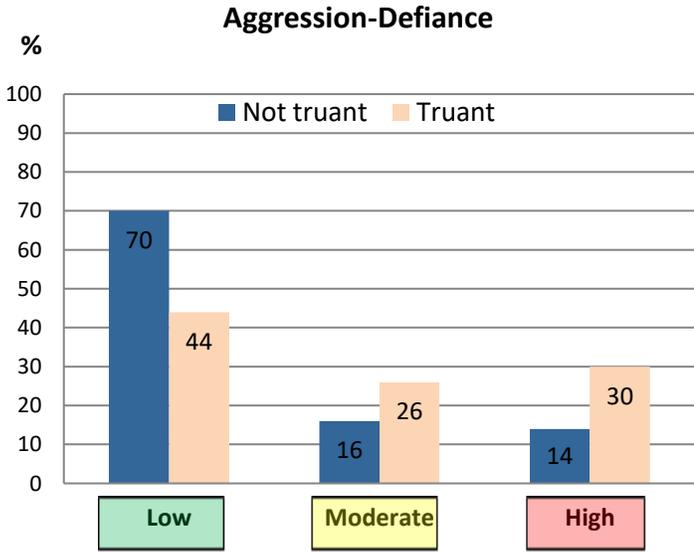
Examples of response patterns, corresponding to each level of need, are presented in Table 1.

<b>Table 1</b>	<b>Low (0 – 4)</b>	<b>Moderate (5 – 7)</b>	<b>High (8+)</b>
2. I got into physical fights	Never (0)	Sometimes (1)	Sometimes (1)
7. I lost my temper and hit or yelled at someone	Sometimes (1)	Often (2)	Often (2)
24. I threatened to hurt someone	Sometimes (1)	Sometimes (1)	Sometimes (1)
27. I lied, disobeyed, or talked back to adults	Sometimes (1)	Sometimes (1)	Often (2)
36. I picked on or bullied other kids	Never (0)	Never (0)	Never (0)
41. I got so angry I hit or broke something	Never (0)	Sometimes (1)	Sometimes (1)
43. I lied, hustled, or conned someone to get what I wanted	Never (0)	Sometimes (1)	Often (2)
45. I damaged or stole something on purpose	Never (0)	Never (0)	Sometimes (1)
<b>Aggression-Defiance Scale Score:</b>	<b>Score: 3</b>	<b>Score: 7</b>	<b>Score: 10</b>

Exhibit 2.1 displays the percentage of truant and non-truant high school students who scored within each level of need on the WARNS Aggression-Defiance scale. Students completed the WARNS anonymously during the first period of a typical school day. Truancy was defined according to a student’s response on the item, “*In the past year, how many times did you skip or cut class?*” Students who indicated they skipped class *about once or twice a month* or more were classified as truant. Ninety students met this definition, with approximately equal numbers indicating they skipped class either *about once or twice a month, about once a week, or more than once a week.*

**Exhibit 2.1.** Comparison of truant and non-truant high school students on the Aggression-Defiance scale

Overall, two-thirds (66%) of all high school students reported a low level of need for intervention regarding aggression and/or defiance, 17% indicated a moderate level of need, and 17% indicated a high level of need for intervention. Males were significantly more likely to score in the moderate and high needs categories than females (males = 21% in each of the moderate and high categories; females = 13%; see Appendix G).



Research indicates that truancy is related to defiant behavior, conduct problems, bullying, and delinquency (Egger et al., 2003; Loeber, 1990; McAra, 2004; Wood et al., 2012). Therefore, one would expect truant students to score higher on the Aggression-Defiance scale.

And in the high school sample, truant students were, in fact, significantly more likely to indicate they engaged in aggressive and defiant behavior. More than twice as many truants (30%) than non-truants (14%) had scores indicating a high need for intervention.

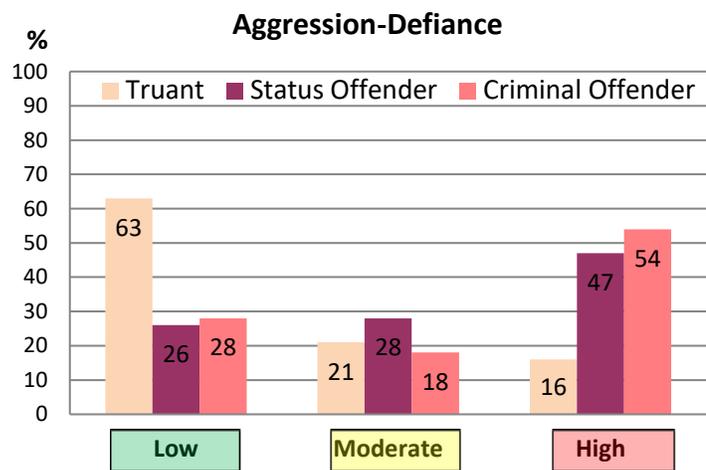
Criminal offending is another example of defiant behavior. The defiance of social norms and laws may be aggressive in nature (e.g., crimes against people) or non-aggressive (e.g., property crimes). A number of items on the Aggression-Defiance scale, if endorsed, could indicate aggressive or non-aggressive behavior that results in an arrest. In addition, delinquent youth tend to lack the ability to adequately control their anger and often lash out at others. Therefore, one would expect a large proportion of juvenile criminal offenders to have a high need for intervention in this area.

Another group of youth, status offenders, are also defiant by definition. In Washington State, status offending behavior consists generally of running away, incorrigibility, substance abuse, and truancy. Therefore, one would also expect status offenders to have a high level of need for intervention related to aggression and defiance as well as other areas of need measured by the WARNS.

To examine whether the WARNS could adequately discriminate between relatively high-risk juvenile offenders (status and criminal) who should theoretically score higher on the Aggression-Defiance scale than lower-risk truants, 306 youth from the same county were categorized according to their levels of need. The status offenders (n = 51) and criminal offenders (n = 67) completed the WARNS while attending a day detention school, while the comparison group of 188 truant students completed the WARNS during meetings with a school-based case manager soon after appearing before a truancy board. The school-based truants had been referred to the truancy board after a relatively low number of unexcused absences. Therefore these students are considered a lower-risk truant sample in general. Unlike the high school sample which used an anonymous administration, these youth were informed that their responses were confidential, but not anonymous.

Results of the comparisons are presented in [Exhibit 2.2](#). A significantly larger percentage of status offenders (47%) and criminal offenders (54%) attending a day detention school were identified as having a high need for intervention related to aggression and defiance compared to truants who appeared before a community truancy board (16%).

**Exhibit 2.2.** Comparison of truant, status offenders and criminal offenders on the Aggression-Defiance scale



### **Needs Scale: Depression-Anxiety (8 items)**

In contrast to those who primarily externalize their distress through aggression and defiance, some individuals may internalize their distress and experience feelings of depression and/or anxiety. When symptoms of depression and anxiety are frequent or severe, physical, social, and psychological functioning may decline. Youth may engage in suicidal behaviors, self-harm, or drug use; physical symptoms may develop; cognitive functioning may decline; and general performance at school or work usually deteriorates (American Psychiatric Association, 2000; Jaycox et al., 2009). While depression and anxiety may be distinct constructs in adulthood, research and clinical practice suggests these emotions tend to occur together in adolescence (Hinden et al., 1997).

Four items assessing symptoms of depression and four items assessing symptoms of anxiety compose the Depression-Anxiety scale. While feelings of depression and anxiety are quite common in adolescence, symptoms that occur *often* or *always* and for a prolonged period warrant further evaluation and treatment. The four depression items measure the frequency of symptoms such as sadness, hopelessness, and lack of concern. These items are:

- 9. I felt like nothing could cheer me up
- 14. I felt down, sad, or unhappy
- 29. I felt hopeless about the future
- 39. I didn't care about anything or anyone

The four items assessing anxiety indicate a level of distress that is beyond one's typical experience or is interfering with cognitive and physical functioning. Somatic complaints such as nausea, or difficulty breathing, eating, or sleeping, often occur at heightened levels of anxiety. The items are:

- 16. I was so worried or bothered by things it was hard to concentrate
- 25. I had trouble sleeping or eating because I couldn't get something off my mind
- 31. I felt more tense, irritated, or worried than usual
- 37. I got so nervous I felt sick, had trouble breathing, or felt shaky

Examples of response patterns, corresponding to each level of need, are presented in Table 2.

Table 2	Low (0 – 6)	Moderate (7 - 10)	High (11+)
9. I felt like nothing could cheer me up	Never (0)	Sometimes (1)	Often (2)
14. I felt down, sad, or unhappy	Sometimes (1)	Often (2)	Often (2)
16. I was so worried or bothered by things it was hard to concentrate	Sometimes (1)	Sometimes (1)	Sometimes (1)
25. I had trouble sleeping/eating because couldn't get something off mind	Sometimes (1)	Sometimes (1)	Often (2)
29. I felt hopeless about the future	Sometimes (1)	Sometimes (1)	Sometimes (1)
31. I felt more tense, irritated, or worried than usual	Sometimes (1)	Often (2)	Often (2)
37. I got so nervous I felt sick, had trouble breathing, or felt shaky	Never (0)	Sometimes (1)	Often (2)
39. I didn't care about anything or anyone	Never (0)	Never (0)	Sometimes (1)
<b>Depression-Anxiety Scale Score:</b>	<b>Score: 5</b>	<b>Score: 9</b>	<b>Score: 13</b>

Exhibit 2.3 displays the percentage of truant and non-truant high school students who scored within each level of need on the WARNS Depression-Anxiety scale. Students completed the WARNS anonymously during the first period of total school day. Truancy was defined according to a student's response on the item, "In the past year, how many times did you skip or cut class?" Students who indicated they skipped class about once or twice a month or more were classified as truant. Ninety students met this definition, with approximately equal numbers indicating they skipped class either about once or twice a month, about once a week, or more than once a week.

Overall, 58% of all high school students reported a low level of need, 22% indicated a moderate level of need, and 20% indicated a high level of need for intervention. Females were significantly more likely to score in the moderate (26%) and high needs (23%) categories than males (moderate = 18%; high = 17%).

Research has found that depression and anxiety are more common among truants than non-

Exhibit 2.3. Comparison of truant and non-truant high school students on the Depression-Anxiety scale

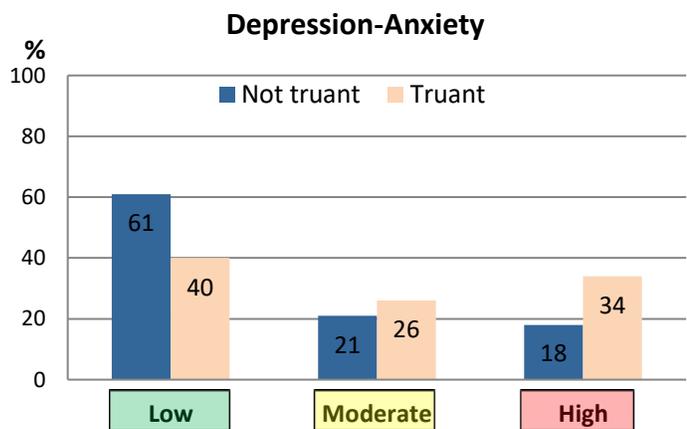
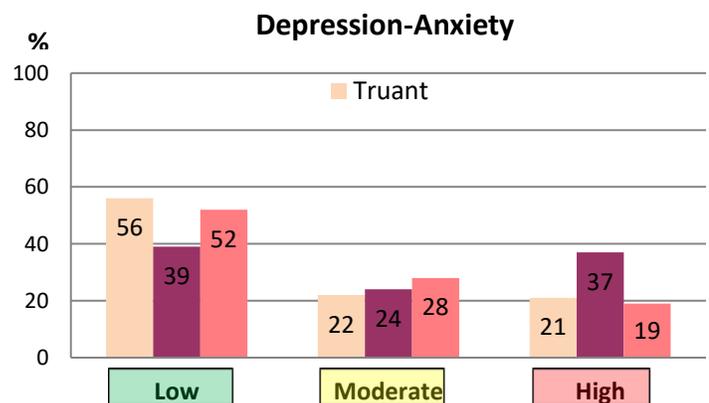


Exhibit 2.4. Comparison of truants, status offenders, and criminal offenders on the Depression-Anxiety scale



truants (Egger, 2003; Kearney, 2003). Similar findings occurred with the high school sample using the WARNS. Almost twice as many truants (34%) than non-truants (18%) had scores indicating a high need for intervention.

Little theoretical work or research evidence exists to guide hypotheses regarding differences in depression and anxiety among school-based truants, or status and criminal offenders attending a secure day-reporting school. Given that criminal offenders often engage in risk-taking behaviors with little regard for others, one might expect these youth to score lower on depression and anxiety, while status offenders and truants would score higher. To investigate differences among the groups, 51 status offenders and 67 criminal offenders completed the WARNS while attending a day detention school, while the comparison group of 188 truant students completed the WARNS during meetings with a school-based case manager soon after appearing before a truancy board.

As seen in Exhibit 2.4, status offenders were most likely to have a high need for intervention regarding depression and anxiety (37%) than either truants (21%) or criminal offenders (19%).

#### **Needs Scale: Substance Abuse (5 items)**

Substance use among adolescents is a great concern among parents, service providers, and others. While experimentation with alcohol or drugs is common during high school, substance use that occurs more than rarely or interferes with school, work, or other activities is strongly associated with many negative outcomes such as truancy, status offending, criminal offending, school failure, and mental health problems (Hammond et al., 2007; Howell, 2003; Loeber & Farrington, 1998).

The Substance Abuse scale is composed of five items. One item each asks the youth how frequently he or she uses alcohol (#22), marijuana (#40), and “hard drugs (#34),” another item addresses the severity of drug or alcohol use (#15), and the fifth item assesses whether drugs or alcohol interferes with school (#38). Because even occasional drug or alcohol use may be a concern, youth are categorized as having a moderate need for intervention even if they say they just *sometimes* use alcohol and marijuana.

The five items are:

- 15. I got sick, passed out, or couldn't remember what happened because of alcohol and drugs
- 22. I drank two or more alcoholic beverages (beer, wine, liquor) in a day
- 34. I used drugs such as cocaine, ecstasy, meth, or pills
- 38. I missed or skipped school to use or recover from drugs or alcohol
- 40. I smoked or used marijuana (pot, weed)

Examples of response patterns, corresponding to each level of need, are presented in Table 3.

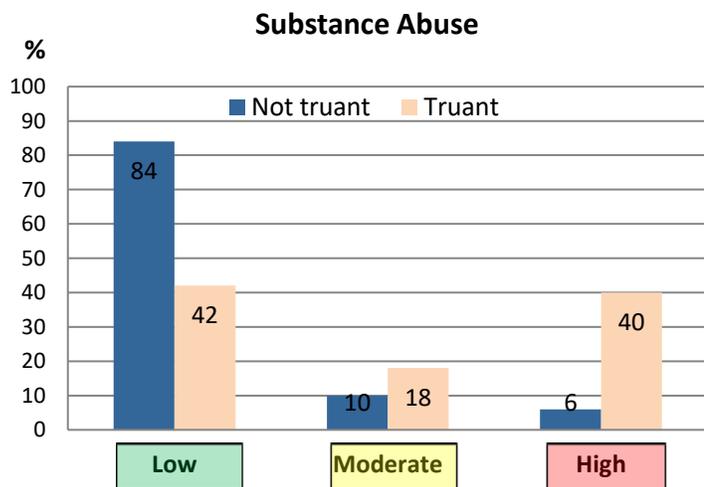
Table 3	Low (0 – 1)	Moderate (2 - 4)	High (5+)
15. I got sick, passed out, couldn't remember because of alcohol/drugs	Never (0)	Never (0)	Sometimes (1)
22. I drank two or more alcoholic beverages (beer, wine, liquor) in a day	Sometimes (1)	Sometimes (1)	Sometimes (1)
34. I used drugs such as cocaine, ecstasy, meth, or pills	Never (0)	Never (0)	Never (0)
38. I missed or skipped school to use or recover from drugs or alcohol	Never (0)	Never (0)	Sometimes (1)
40. I smoked or used marijuana (pot, weed)	Never (0)	Sometimes (1)	Often (2)
<b>Substance Abuse Scale Score:</b>	<b>Score: 1</b>	<b>Score: 2</b>	<b>Score: 5</b>

Exhibit 2.5 displays the percentage of truant and non-truant high school students who scored within each level of need on the WARNS Substance Abuse scale. Students completed the WARNS anonymously during the first period of total school day. Truancy was defined according to a student's response on the item, "In the past year, how many times did you skip or cut class?" Students who indicated they skipped class about once or twice a month or more were classified as truant. Ninety students met this definition, with approximately equal numbers indicating they skipped class either about once or twice a month, about once a week, or more than once a week.

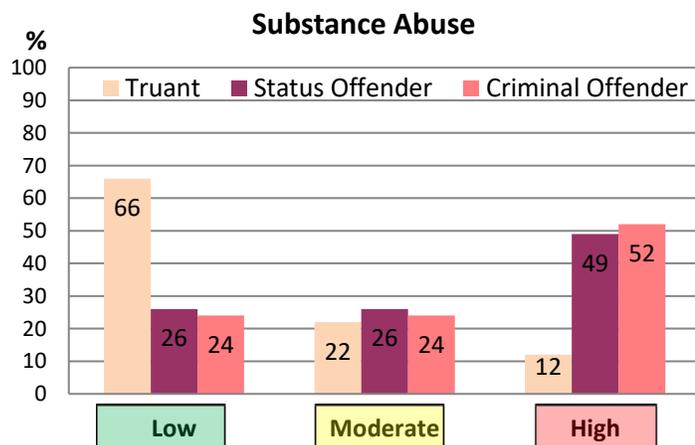
Results of the anonymous administration with high school students indicated that over three-fourths (77%) reported a low level of need, 11% indicated a moderate level of need, and 11% indicated a high level of need for intervention. A greater percentage of males scored in the moderate and high needs categories (12% in each) than females (11% and 10%, respectively), but the differences were not statistically significant.

With respect to truant students, research has consistently found greater use and abuse of alcohol, marijuana, and other illegal substances (Egger et

**Exhibit 2.5.** Comparison of truants and non-truants on the Substance Abuse scale.



**Exhibit 2.6.** Comparison of truants, status and criminal offenders on the Substance Abuse scale



al., 2003; Henry, 2007; Henry & Huizinga, 2007; Henry et al., 2009; McAra, 2004). And in the high school sample, the truant students were more than four times more likely to report substance abuse on the WARNS (9% for non-truants, 40% for truants). Further, more than half of all truants (58%) had scores indicating a moderate or high need for intervention.

Research has also consistently found greater substance use and abuse among delinquent youth, though whether any differences exist between status offenders and criminal offenders is unclear. Given that the status and criminal offenders were attending a day-detention school, and that frequent drug use is one reason a youth may receive an at-risk youth petition (i.e., a status offense), it was expected that these youth would report a greater degree of substance abuse on the WARNS than the truants who were still enrolled in a traditional or alternative high school.

To investigate differences among the groups, 51 status offenders and 67 criminal offenders completed the WARNS while attending a day-detention school, while the comparison group of 188 truant students completed the WARNS during meetings with a school-based case manager soon after appearing before a truancy board. As shown in Exhibit 2.6, results indicated that approximately half of the status offenders (49%) and criminal offenders (52%) had a high need for intervention compared to 12% of the truant students. It should be noted that a high need for intervention indicates either occasional use of alcohol, marijuana, *and* other illegal substances, or frequent use of at least one substance. In addition, approximately one-quarter of all three groups of students had a moderate need for intervention, indicating either occasional multi-drug use, or heavy or frequent use of a single drug.

#### **Needs Scale: Peer Deviance (5 items)**

During adolescence, youth develop strong associations with their peer group and close friends. Teens often begin exploring different types of activities and relationships within these contexts, and begin testing social norms and rules with greater intensity. The peer group is highly influential in the process. Considerable evidence indicates that peers often encourage their friends to initiate, maintain, or escalate deviant activities such as truancy, delinquency, or drug use. Elliot and Menard (1996, p. 29) note, "One of the most stable and well-established findings in delinquency research is that the delinquent behavior of an individual is positively related to the actual or perceived delinquent behavior of that individual's friends".

Five items assess peer deviance across a variety of behaviors: drug use, delinquency, truancy, trouble at school, and fighting. Youth whose friends engage in these activities are more likely to engage in them themselves. Youth may also be more likely to admit to deviant behavior among their friends more so than themselves. The five items are:

11. My friends got drunk or high from alcohol, marijuana (pot, weed), or other drugs
19. My friends did things that could have got them arrested
30. My friends got into trouble at school
35. My friends skipped or cut class
47. My friends got into physical fights

Examples of response patterns, corresponding to each level of need, are presented in Table 4.

<b>Table 4</b>	<b>Low (0-4)</b>	<b>Moderate (5-8)</b>	<b>High (9+)</b>
11. My friends got drunk/high from alcohol, marijuana, or other drugs	Sometimes (1)	Often (2)	Always (3)
19. My friends did things that could have got them arrested	Sometimes (1)	Sometimes (1)	Often (2)
30. My friends got into trouble at school	Sometimes (1)	Often (2)	Often (2)
35. My friends skipped or cut class	Sometimes (1)	Sometimes (1)	Often (2)
47. My friends got into physical fights	Never (0)	Never (0)	Sometimes (1)
<b>Peer Deviance Scale Score:</b>	<b>Score: 4</b>	<b>Score: 6</b>	<b>Score: 10</b>

Exhibit 2.7 displays the percentage of truant and non-truant high school students who scored within each level of need on the WARNS Peer Deviance scale. Students completed the WARNS anonymously during the first period of total school day. Truancy was defined according to a student’s response on the item, “*In the past year, how many times did you skip or cut class?*” Students who indicated they skipped class *about once or twice a month* or more were classified as truant. Ninety students met this definition, with approximately equal numbers indicating they skipped class either *about once or twice a month, about once a week, or more than once a week*.

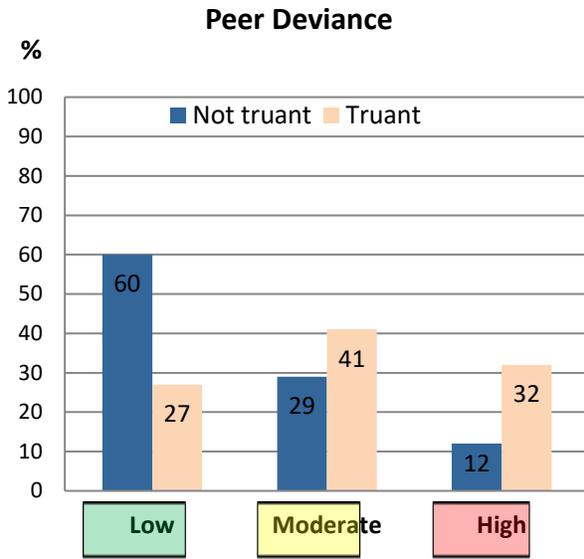
Overall, approximately one-half (54%) of all high school students reported a low level of need, 31% indicated a moderate level of need, and 15% indicated a high level of need for intervention. A slightly higher percentage of males scored in the moderate (33%) and high needs categories (16%) than females (29% and 13%, respectively), though the differences were not statistically significant.

Based on previous research that found truant students tend to have more deviant and delinquent peers (Henry & Huizinga, 2007; McNeal, 1999), it was expected that the self-identified truants in the traditional high school sample would be no different. Results indicated that 41% of the truants reported moderate peer deviance and 32% reported high peer deviance. This compares to 29% of the non-truants in the moderate category and 12% in the high category (high needs comparison).

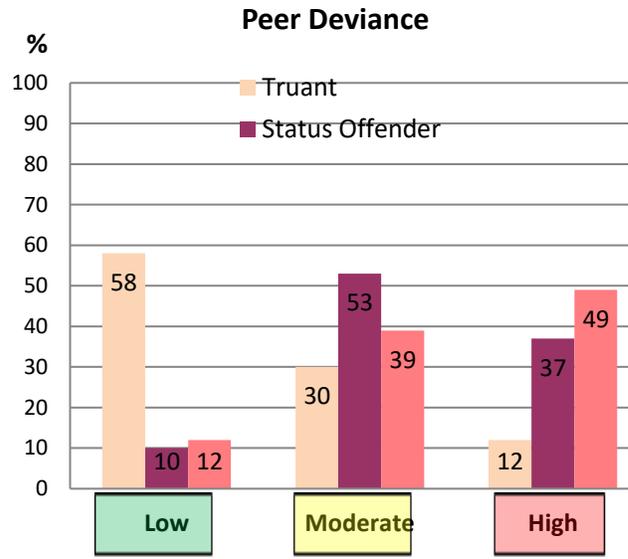
Because the status offenders and criminal offenders had engaged in considerable deviant behavior and were therefore attending a day-detention school, it was expected that they would report more deviant peers than the truants who were still in a traditional or alternative high school. To investigate differences among the three groups, 51 status offenders and 67 criminal offenders completed the WARNS while attending a secure, day-reporting school, while the comparison group of 188 truant students completed the WARNS during meetings with a school-based case manager soon after appearing before a truancy board.

Using the WARNS, 12% of truants, 37% of status offenders, and 49% of criminal offenders had a high need for intervention regarding their deviant peers (Exhibit 2.8). The difference between status and criminal offenders compared to truants was statistically significant, though due to the small sample sizes, the difference between status and criminal offenders was not statistically reliable.

**Exhibit 2.7.** Comparison of truant and non-truant high school students on the Peer Deviance scale.



**Exhibit 2.8.** Comparison of truants, status offenders, and criminal offenders on the Peer Deviance scale



**Needs Scale: Family Environment (5 items)**

Parents continue to play a vital role in the social and emotional development of their children throughout adolescence. As teens seek independence from their parents, and develop stronger associations and intimacy with their peers, the nature of the parent-child relationship changes. The way in which parents and teens adjust to this transition has significant implications for the teens’ current and future functioning. While family conflicts are common during this period, they are usually temporary and have few, if any, long-term negative ramifications. However, if during this transition a parent and youth do not adjust their relationship, and if a parent engages in control, harsh punishments, and little cognitive and emotional engagement, negative outcomes become much more likely (Loeber & Stouthamer-Loeber, 1986).

Youth need ongoing positive relationships with their parents and a supportive home environment for healthy development. Parents provide a secure base from which to explore the world, and continue to provide important physical, cognitive, and emotional support and guidance. The five items on the Family Environment needs scale are designed to assess the general quality of the parent-child relationship and environment. They are not designed to screen for serious or abusive altercations. Two items assess parental support (#28, #50), one assesses conflict (#21), one assesses feelings of closeness (#3), and one item assesses a youth’s general attitude towards the home environment (#6). Four of the items are framed positively and are, therefore, reverse scored. Higher scale scores indicate a more dysfunctional home environment.

The five items are:

- 3. I felt close to my parents\*
- 6. If I wanted to do homework, my parents’ home was a good place to be\*
- 21. I got into arguments with my parents
- 28. I could talk to my parents if I had a problem\*
- 50. My parents would help me with my homework if I asked\*

Examples of response patterns, corresponding to each level of need, are presented in Table 5.

<b>Table 5</b>	<b>Low (0-6)</b>	<b>Moderate (7-9)</b>	<b>High (10+)</b>
3. I felt close to my parents*	Often (1)	Sometimes (2)	Never (3)
6. If I wanted to do homework, my parents’ home was good place to be*	Often (1)	Often (1)	Sometimes (2)
21. I got into arguments with my parents	Sometimes (1)	Often (2)	Often (2)
28. I could talk to my parents if I had a problem*	Sometimes (2)	Sometimes (2)	Never (3)
50. My parents would help me with my homework if I asked*	Always (0)	Often (1)	Often (1)
<b>Family Environment Scale Score:</b>	<b>Score: 5</b>	<b>Score: 8</b>	<b>Score: 11</b>

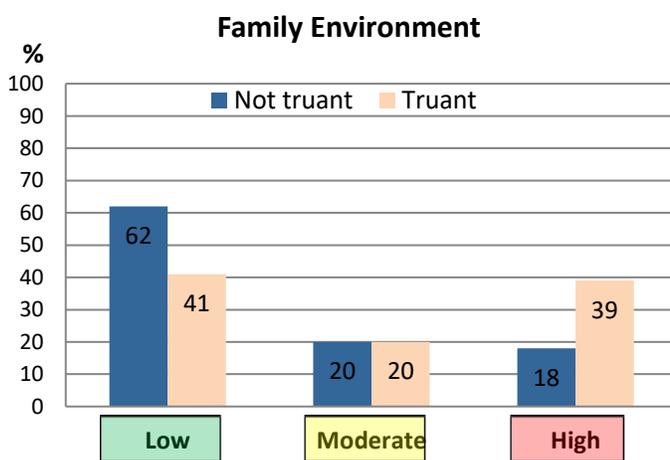
\*Reverse scored

Exhibit 2.9 displays the percentage of truant and non-truant high school students who scored within each level of need on the WARNS Family Environment scale. Students completed the WARNS anonymously during the first period of the school day. Truancy was defined according to a student’s response on the item, “*In the past year, how many times did you skip or cut class?*” Students who indicated they skipped class *about once or twice a month* or more were classified as truant. Ninety students met this definition, with approximately equal numbers indicating they skipped class either *about once or twice a month, about once a week, or more than once a week*.

Fifty-nine percent (59%) of high school students reported a low level of need, 21% indicated a moderate level of need, and 20% indicated a high level of need for intervention. A slightly higher percentage of females scored in the moderate and high needs categories (22% in each) than males (19% in each), though the differences were not statistically significant.

With respect to truant and non-truant students, research suggests that truants have a higher degree of family conflict, and they have parents who provide little monitoring or supervision (McAra, 2004; McNeal, 1999). The Family Environment scale on the WARNS measures a youth’s level of attachment to parents and the home (including family conflict).

**Exhibit 2.9.** Comparison of truant and non-truant high school students on the Family Environment scale

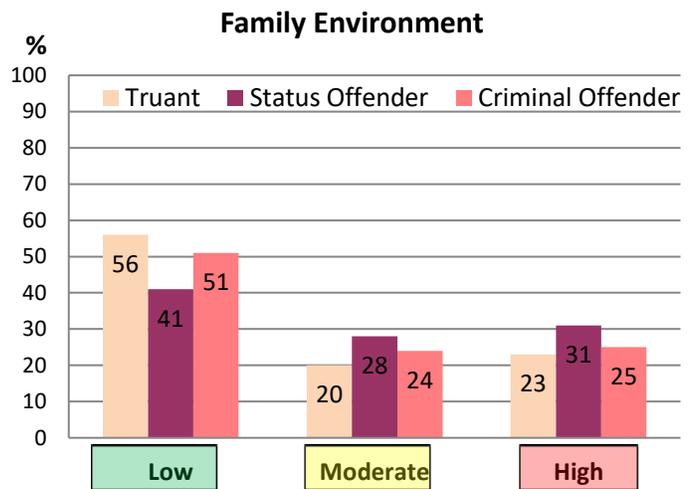


Therefore it was expected that truant youth would report a higher need for intervention in this area. And the results from the research with the traditional high school sample did, in fact, find this to be the case. More than twice as many truants scored in the high needs category (39%) than did non-truants (18%).

Research also indicates that youth with more serious and chronic offending tend to have poorer family functioning characterized by conflict, lack of involvement, disruption and deviancy (Gorman-Smith et al., 1998). To investigate potential differences among delinquent youth, 51 status offenders and 67 criminal offenders completed the WARNS while attending a secure day-reporting school; a comparison group of 188 truant students completed the WARNS during meetings with a school-based case manager soon after appearing before a truancy board. It was expected that a greater percentage of status and criminal offenders would have a high need for intervention with respect to family functioning. However, results indicated a similar percentage of youth (approximately one-quarter to one-third) were categorized as high need across all three groups (see Exhibit 2.10).

The Family Environment scale of the WARNS may not be appropriate for distinguishing among high levels of family discord and disengagement that could lead to different patterns of offending behavior. However, the difference noted among truants and non-truants in the high school sample suggests this scale may indicate early signs of difficulties which may be amenable to therapeutic intervention.

**Exhibit 2.10.** Comparison of truants, status and criminal offenders on the Family Environment scale.



**Needs Scale: School Engagement (9 items)**

School engagement is rarely included in typical social and emotional assessments. However, how one adapts and performs in the challenging school environment has major implications for a youth’s life. High school is a time of significant social, emotional, physical, and cognitive development. Youths’ adjustment during this period is often a determining factor in one’s life trajectory. A lack of school engagement is associated with truancy, delinquency, and drug use in adolescence, and is predictive of dropping out of school, adult criminal offending, and poor financial outcomes in adulthood, among others (Chase, et al., 2014; Gonzalies, et al., 2014).

The School Engagement scale consists of nine items. Four items assess feelings of connection to the school environment and the task of learning. These items are:

- 1. I liked going to school\*
- 17. I learned things in class that will be important later in life\*
- 26. I thought about dropping out of school
- 44. My classes were interesting\*

Two additional items assess youths’ efforts to succeed in school:

- 23. I studied for my quizzes and tests\*
- 32. I got my homework completed and turned in on time\*

And three items assess youths’ attitudes and connections to teachers and school staff:

- 8. I felt supported and respected by the adults at school\*
- 13. I could talk to an adult at school if I had a problem\*
- 42. My teachers cared about me\*

Examples of response patterns, corresponding to each level of need, are presented in Table 6.

<b>Table 6</b>	<b>Low (0-13)</b>	<b>Moderate (14-17)</b>	<b>High (18+)</b>
1. I liked going to school*	Often (1)	Sometimes (2)	Sometimes (2)
8. I felt supported and respected by the adults at school*	Often (1)	Often (1)	Sometimes (2)
13. I could talk to an adult at school if I had a problem*	Sometimes (2)	Sometimes (2)	Never (3)
17. I learned things in class that will be important later in life*	Often (1)	Sometimes (2)	Sometimes (2)
23. I studied for my quizzes and tests*	Often (1)	Sometimes (2)	Sometimes (2)
26. I thought about dropping out of school	Never (0)	Sometimes (1)	Sometimes (1)
32. I got my homework completed and turned in on time*	Often (1)	Sometimes (2)	Sometimes (2)
42. My teachers cared about me*	Often (1)	Sometimes (2)	Sometimes (2)
44. My classes were interesting*	Sometimes (2)	Sometimes (2)	Never (3)
<b>School Engagement Scale Score:</b>	<b>Score: 10</b>	<b>Score: 16</b>	<b>Score: 19</b>

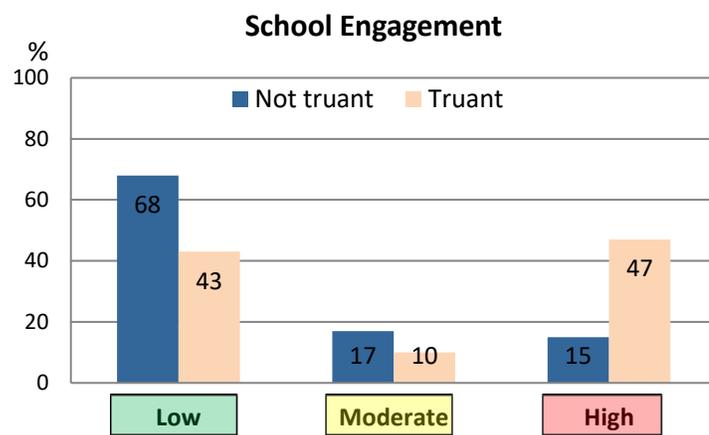
\*Reverse scored

Exhibit 2.11 displays the percentage of truant and non-truant high school students who scored within each level of need on the WARNS School Engagement scale. Students completed the WARNS anonymously during the first period of the school day. Truancy was defined according to a student’s response on the item, “*In the past year, how many times did you skip or cut class?*” Students who indicated they skipped class *about once or twice a month* or more were classified as truant. Ninety students met this definition, with approximately equal numbers indicating they skipped class either *about once or twice a month, about once a week, or more than once a week*.

Research on the WARNS with the traditional high school sample found that nearly two-thirds (64%) of high school students reported a low level of need, 16% indicated a moderate level of need, and 20% indicated a high level of need for intervention. Males (25%) were significantly more likely to score in the high needs category than females (15%; see Appendix G).

While truancy itself would seem to indicate a high degree of school disengagement, it is not necessarily the case. Some students may enjoy their classes, teachers, and the school environment, yet skip class for other reasons (e.g., to care for a sibling or parent; physical or mental health issues). Other students may be engaged, yet be so credit deficient or have other more rewarding experiences available to them that they choose not to attend school. Despite these possibilities, research indicates that truant students are more likely than non-truants to have negative views of teachers, their teaching, and the school environment (Henry & Huizinga, 2007; McAra, 2004). A comparison of self-identified truants and non-truants on the School Engagement scale of the WARNS found that nearly half (47%) of the truants had a high need for intervention compared to 15% of the non-truants.

**Exhibit 2.11.** Comparison of truant and non-truant high school students on the School Engagement scale.



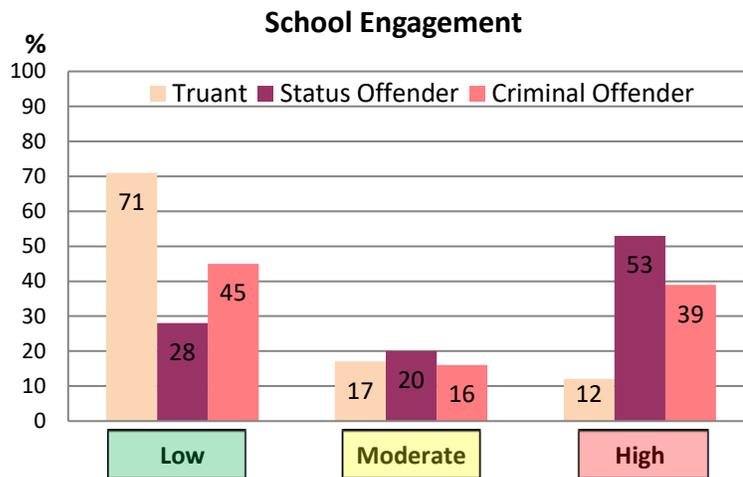
Status offending and criminal offending are also related to truancy and school disengagement (Howell, 2003; Loeber & Farrington, 1998). Because many of the status offenders in the WARNS studies were attending the day-detention school due to chronic truancy and failure to comply with court orders to attend school, it was expected that they would evidence a high degree of school disengagement (i.e., a high need for intervention). The criminal offenders, who could be engaged with school yet still be required to attend the day-reporting school due to the committed offense, were expected to have a lower level of disengagement.

To investigate differences among the three groups, 51 status offenders and 67 criminal offenders completed the WARNS while attending a day-detention school, while the comparison group of 188 truant students completed the WARNS during meetings with a school-based case manager soon after appearing before a truancy board. Over half (53%) of the status offenders were considerably disengaged and had a high need for intervention, as were 39% of the criminal offenders. Both groups had a significantly higher percentage of disengaged students than the school-based truant group (12%) (Exhibit 2.12).

The low percentage of the school-based truants that had a high need for intervention with school engagement was unexpected. One possible explanation is that the truancy board

process and the interactions with a case manager that had already occurred may have created a sense of optimism that their various needs were going to be addressed. Another possibility relates to the fact that they were defined as truant due to the number of unexcused absences they had accrued. Even though they may have missed school for a valid reason, they may not have followed appropriate procedures to have their absences documented as excused rather than unexcused. Finally, the school from which the sample was drawn had an active tracking and referral system, and the students tended to appear before the truancy board with a relatively low number of unexcused absences compared to other sites. When examining data from the other sites and limiting the sample to only self-identified truants using the same procedure as with the anonymous administration in the traditional high school, the percentage with a high need for intervention rose to 41%. More research is needed with truant populations to better understand school engagement issues and how best to intervene.

**Exhibit 2.12.** Comparison of truants, status offenders and offenders on the School Engagement scale



## Other WARNS Items

The WARNS contains a number of other items important to risk and needs assessments. Most of these items have been found to be significant predictors of truancy, delinquency, and school drop-out (Hammond et al., 2007; Howell, 2003; Loeber & Farrington, 1998). These items are organized by content domain on the WARNS Report. The items, with response options in parentheses, are presented below.

### Demographics

- ◆ **Age** (12 through 20<sup>2</sup>)
- ◆ **Grade** (6 – 12)
- ◆ **Gender** (Female, Male)
- ◆ **Race/ethnicity** (American Indian/Alaska Native; African-American/Black; Asian; Hispanic/Latino; Pacific Islander; White/Caucasian)

### Family

- ◆ **Which adults do you currently live with?** (Mom, Dad, Step-mom, Step-dad, Grandmother, Grandfather, Other adult(s), No adult)
- ◆ **How many different homes have you lived in during the past 2 years?** (None (homeless), 1, 2, 3 - 5, 6 or more)
- ◆ **How many times have you been in foster care?** (none, 1, 2, 3 or more)
- ◆ **Did any of your sisters or brothers drop out of junior high or high school?** (Yes, No, I don't have any brothers or sisters)
- ◆ **How many times have you run away or been kicked out of your home for more than a day?** (0, 1, 2, 3 – 5, 6 or more)

### School

- ◆ **How many different schools have you attended in the past 2 years?** (0, 1, 2, 3 – 5, 6 or more)
- ◆ **Have you ever been held back or not promoted to the next grade in school?** (Yes, No)
- ◆ **What were your most recent grades at school?** (Mostly A's and B's, Mostly B's and C's, Mostly C's and D's, Mostly D's and F's)
- ◆ **How far do you think you will go in school?** (Won't finish high school, High school diploma/GED, Associate's, Bachelor's, Master's, advanced degree)
- ◆ **In the past YEAR, how many times did you skip or cut class?** (Never, A few times all year, About once or twice a month, About once a week, More than once a week)

---

<sup>2</sup> Even though the WARNS was designed for 13 – 18 year-olds, it may be appropriate for slightly younger or older students depending upon the circumstances. However, the survey is not yet validated for use with students not yet in high school.

- ◆ **How many times in your life have you been suspended or expelled from school?** (Never, 1, 2, 3-5, 6-10, 11 or more)

### **Criminal History**

- ◆ **How many times have you been arrested or charged with a crime?** (0, 1, 2, 3 – 5, 6 or more)
- ◆ **How old were you the first time you were arrested or charged with a crime?** (0 – 20, never arrested or charged with a crime)
- ◆ **How many times have you spent at least one night in juvenile detention?** (0, 1, 2, 3 – 5, 6 or more)

### **Barriers to Attendance**

Four items assess a student’s current experiences and may play an important role in truant behavior. These items are:

- ◆ **Do you have a learning disability (LD), a mental health problem, or a behavior disorder (like ADD/ADHD)?** (Yes, No)
- ◆ **How often do you babysit or provide care for someone during school hours?** (Never, Sometimes, Often)
- ◆ **Do you have any health problems that make you miss a lot of school?** (Yes, No)
- ◆ **How often do you have trouble getting a ride to school?** (Never, Sometimes, Often)

### **Trauma**

- ◆ **Have your parents divorced or separated in the last year?** (Yes, No)
- ◆ **Have you ever seen anyone very badly hurt or killed in person (not on TV, video, or computer)?** (Yes, No)
- ◆ **Did anyone you felt close to die in the last year?** (Yes, No)

Finally, the WARNS includes a number of items that were not included in the six Needs Scale. Some were included due to their general interest among stakeholders (e.g., experiences of being bullied, gang involvement), while others exist to determine if they can improve the reliability and validity of the Needs Scales.

### These items include the following:

- |   |  |
|---|--|
| ◆ <i>Things in my home were stressful</i>   | ◆ <i>I broke the rules at home, work, or school</i>                                    |
| ◆ <i>I had little interest or pleasure in doing the things I usually like to do</i> | ◆ <i>I got into trouble at school (kicked out of class, disciplined, suspended)</i>    |
| ◆ <i>Other kids at school picked on or bullied me.</i>                              | ◆ <i>I stayed out past my curfew or overnight somewhere without telling my parents</i> |
| ◆ <i>I smoked cigarettes</i>  | ◆ <i>I did things that could have got me arrested</i>                                  |
| ◆ <i>I hung out with gang members</i>   |  |

## SECTION III. A RESEARCHER'S GUIDE TO THE DEVELOPMENT, RELIABILITY AND VALIDITY OF THE WARNS

### Critical Concepts in Test Construction: Score Reliability and Validity

Classical test theory assumes that each person has a *true score* (the score the person would receive if there were no errors in measurement). Note that no assessment, especially in the educational, social, and behavioral sciences, is free of error; all measures reflect some degree of random error so the true score is always an unknown. Therefore, a person's obtained score on the WARNS is an approximation of the person's true score. The difference between the obtained score and the true score is measurement error. Higher reliability values indicate scores on an assessment have minimal error. To confirm the reliability of the scores on the WARNS, score reliability was examined in two forms:

- Internal consistency indicates the homogeneity of item responses within the WARNS Needs Scales. That is, it indicates the extent to which items are correlated with one another and free of measurement error.
- Test-retest reliability indicates the stability of a child's scores when tested at multiple points in time over a short period.

Test validation is the most essential and fundamental aspect of test construction (AERA, APA, NCME, 2014). Ultimately, test score validity is said to refer to the degree to which the decisions based on test scores and the inferences on which the decisions are based, are justified by supporting evidence (Linn, 2005). Many forms of evidence contribute to a body of evidence to support the construct validity of test scores for a given purpose (Messick, 1989). We provide several pieces of evidence for the WARNS scores:

- Evidence based on test content (content validity) answers the question "Do WARNS items sample risk and needs skills considered important by researchers and educators?"
- Evidence based on internal structure (construct validity) answers the question "To what extent do WARNS scores indicate a child's standing on distinct measured traits?"
- Evidence based on fairness (construct validity) answers the question "Do persons of similar need/risk level have the same chance of endorsing WARNS items regardless of group membership (e.g., male vs. female)?"
- Evidence based on associations with other variables (criterion-related validity) answers questions such as:
  - "Do WARNS scores correlate with comparable and related measures?"
  - "Is there evidence to suggest the WARNS is measuring intended constructs when compared to measures that are assessing different constructs?"

## Previous Development Efforts

Dr. Tom George developed the WARNS and was responsible for all of the pilot and preliminary studies referred to in this sub-section. Development of the Washington Assessment of the Risks and Needs of Students (WARNS) began in the summer of 2008 in Washington State with discussions among juvenile justice professionals about the need for a risk and needs assessment for status offenders and low-level juvenile criminal offenders. The WARNS was modeled after the widely used and validated Washington State Juvenile Court Assessment for juvenile offenders (Barnoski, 2004). However, rather than develop an assessment that required a lengthy in-person interview process, and given the large number of youth for whom the instrument was potentially applicable, logistical and resource considerations led to the development of a brief self-report measure which could be administered efficiently and economically on a large-scale basis.

The domain and item development process began with a review of the research literature on correlates and predictors of truancy, delinquency, and dropping out of school (e.g., Hammond et al., 2007; Howell, 2003; Loeber & Farrington, 1998). Next, a review was conducted of validated research and clinical instruments developed to assess juvenile offending, child and adolescent psychopathology, and educational engagement and outcomes. Examples of instruments that were reviewed included the Washington State Juvenile Court Assessment (Barnoski, 2004), the Youth Self Report (Achenbach & Edelbrock, 1991), the Minnesota Multiphasic Personality Inventory for Adolescents (Butcher et al., 1992), the Reynolds Adolescent Depression Scale (Reynolds, 2002), the Strengths and Difficulties Questionnaire (Goodman, 2001), the Global Appraisal of Individual Needs (Dennis, White, Titus, & Unsicker, 2006), the Problem Oriented Screening Instrument for Teenagers (Rahdert, 1991), and the National Center for School Engagement Student Survey (National Center for School Engagement, 2004). Finally, given the emphasis on assessing social and emotional needs of youth, the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, American Psychiatric Association, 2000) was reviewed for additional symptoms and disorders to consider for inclusion on the WARNS.

Based on these reviews, broad areas of assessment were identified that would appropriately address youths' risks for problematic outcomes as well as their social and emotional needs. Items were developed to assess youths' historical risk factors in areas such as school performance, family functioning, criminal justice, and traumatic experiences. Because of the focus on at-risk students, another set of items addressed recent school performance, educational expectations, and barriers to attendance. Questions in these areas had a variety of multiple response options. Finally, eight domains were selected for item development given their importance for healthy social, emotional, and educational functioning: Aggression, Defiance, Anxiety, Depression, Substance Abuse, Peer Deviance, Family Environment, and School Engagement. These domains were envisioned as distinct areas of need which could be assessed with multi-item rating scales. Item pools were then generated for each domain. A four-point rating scale assessing the frequency of specific thoughts, feelings, and behaviors during the previous two months was chosen for measurement. The four rating-scale response options were: *Never or hardly ever*, *Sometimes*, *Often*, and *Always or almost always*.

### **Early Pilot Studies**

Preliminary pilot studies were conducted in the summer and fall of 2009, followed by a validation study that ran from late fall of 2009 through the spring of 2012. These pilot studies provided strong evidence for the reliability and validity of the WARNS. These studies also focused on the amount of time needed to complete the WARNS, the reading comprehension level necessary for the assessment, the clarity of assessment items, and administration issues encountered by court staff. As a result of these pilot studies, response options for some items were reduced, wording was simplified, and a number of items were eliminated from consideration.

In the fall of 2009, a larger pilot study was conducted with 669 ninth through twelfth-grade students in a mid-sized traditional high school in western Washington. Demographic characteristics of the students were similar to the statewide adolescent population, with 51% of the sample consisting of males and 69% identifying as White Asian/Pacific Islander and African-American students were slightly underrepresented and Hispanics were slightly overrepresented in this sample. Based on an analysis of the results, the initial eight Needs Scales were reduced to six scales comprised of 40 items total. The results of a factor analysis determined that a seven factor solution best represented the underlying constructs; however two of the scales were theoretically related to school experiences and so were combined in the School Engagement Scale. An additional 38 items were retained for risk assessment and related purposes (see [Appendix E](#) for a full discussion of the results of the factor analyses and internal reliability studies referred to here).

### **Validation Study Involving Truant Youth**

Given the intent of the WARNS to be used primarily with status offenders and other at-risk youth, a reliability and validity study was conducted with 964 adolescents who were 13 to 17 years old and who had been referred to juvenile court on a truancy petition. In Washington State, students who accumulate seven unexcused absences in a month or ten in a year are required by law to have a truancy petition filed in the courts.

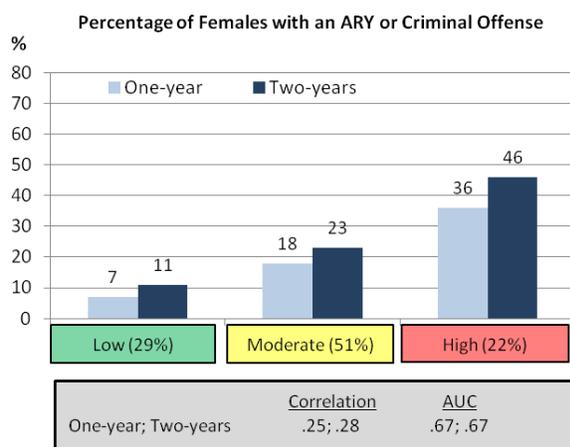
Juvenile court staff in six counties across the state administered the WARNS during their court or intervention process between November 2009 and May 2012. Students voluntarily completed the WARNS either at the time they appeared in court for a truancy workshop with or without a hearing, while attending a community truancy board meeting, during case management activities within a month after an initial meeting or hearing, or while attending a day-detention school for youth with a history of status offenses and/or criminal offenses. Juvenile court staff reported that students completed the WARNS, on average, in approximately 15 minutes and required little assistance. After completion of the administration phase of the study, follow-up data on subsequent juvenile court contacts was collected for an additional 12 to 24 months. A factor analysis was performed that replicated and verified the original six-factor solution. Item reliability was again found to be strong for the group as a whole. Further item analyses by gender and racial/ethnic subgroup resulted in alpha coefficients ranging from acceptable to very good for all subgroups with just two relatively minor exceptions (see [Appendix F](#) for a full discussion of the analyses and results of the validation study).

## Predictive Validity

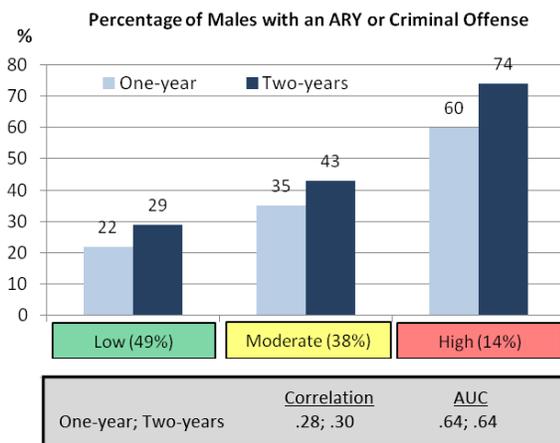
One of the most important functions of the WARNS is the potential to predict an increased risk for problematic outcomes to allow for appropriate early intervention. Another early study examined the predictive validity of the WARNS with respect to delinquency. This study used the population of 964 youth referred to above and in [Appendix F](#). Analyses were performed separately for females and males, and delinquency was defined as any court referral for an At-Risk Youth (ARY) petition or a criminal offense that occurred within two years after the WARNS administration (refer to [Appendix G](#) for details on design and analysis of this study).

The results showed a moderate association between the WARNS risk scores and delinquency outcomes (both ARY and criminal offense) for both females and males in each risk category (see [Exhibit 3.1](#) and [Exhibit 3.2](#)). These findings are important to stakeholders seeking to identify the highest-risk truants for targeted interventions. If reducing delinquency is a primary concern, then providing evidence-based services to high-risk males, for example, who have a 60% chance of being referred to court for a status or criminal offense in the next year will likely be more effective than providing services to the low-risk truants who have a 22% chance. Over time, the improvement in youths' lives and the associated cost-savings from reduced delinquency could be substantial. However, the likelihood of continued problematic behaviors among the low and moderate risk youth should not be ignored given that the truants are already at-risk as a result of poor school attendance. The most beneficial approach will likely involve considering students' risks and needs as identified by the WARNS and other sources of information. It should be noted that the risk equations presented in this manual should only be used with court-referred truant populations. Other populations of interest would undoubtedly have different risk equations with varying level of predictive accuracy.

**Exhibit 3.1.** Percentage of Females in each Risk Category with an ARY Petition or Criminal Offense, the Correlation Coefficient, and the AUC during the One-year and Two-year Follow-up.



**Exhibit 3.2.** Percentage of Males in each Risk Category with an ARY Petition or Criminal Offense, the Correlation Coefficient, and the AUC during the One-year and Two-year Follow-up.



## **2014 Item Review Information and Reliability**

A series of studies were conducted in 2014 in order to build upon the previous successful efforts described above, and to provide additional reliability and validity evidence to continue the support for the WARNS. These new studies provide strong evidence for the WARNS in identifying the needs of youth who are truant or at-risk for truancy. Data from the 2009 High School sample reported earlier ( $n = 669$ ) were used for item analysis for all the questions on the WARNS. Classical test theory (CTT) and item response theory (IRT) methods were employed to examine the psychometric properties of items in order to determine the ability of scores from the WARNS to accurately screen students for risks and needs. Item intensity (i.e., average level of endorsement for an item) and item discrimination (i.e., how well an item differentiates between individuals who are high and low on the measured trait) were examined for the total scale and each subscale. For the given purpose of the instrument, most item intensities in the CTT analysis were expected to be just above the middle of the scale (i.e., between 1.5 and 2.5). Item discrimination values greater than 0.40 indicated an item was acceptable, a value between 0.30-0.39 indicated an item needed little to no revision, values between 0.20-0.29 indicated a need for item revisions, and values less than or equal to 0.19 indicated an item may need to be deleted or reconsidered with content considerations. IRT graded response models were employed on the total scale and each subscale, and discrimination and intensity estimates were observed. Typically, intensity values ( $b$ ) range from -3 (very low level of the trait required for item endorsement) to +3 (very high level of the trait required for item endorsement). Values of discrimination ( $a$ ) typically range from 0.0 to 2.0, but can go much higher.

IRT graded response models were employed on the total scale and each subscale. Information functions, from the IRT models, were examined to graphically depict where on the continuum of the measured trait each subscale provided the most information. As stated above, given the purpose and intended uses of the WARNS, the instrument would optimally provide the most information on individuals just above the middle of the trait distribution. In this case, a test information curve would possess a broad peak over  $\theta$  (i.e., person estimate) values of 0 to 2. A test information curve shape deviating from this expectation may suggest a need for scale revision.

### **Internal Consistency Reliability**

The next step in the process involved an analysis of the internal reliability of the items forming each scale. Internal consistency indicates the extent to which items on the WARNS are correlated with one another and free of measurement error. Analyses of internal consistency reliabilities for the total scale and each subscale were conducted using a common measure of internal consistency reliability, Cronbach's coefficient alpha. The higher the value of the coefficient generally results in consistent scores. Ideally, internal consistency reliability estimates above 0.70 are acceptable for most purposes (e.g., identifying low or high aggression traits; Nunnally & Berstein, 1994) and estimates above 0.80 are good reliability indicators.

The final WARNS instrument consisted of 40 items, composing the six Needs Scales, for the prediction of risk, potential utility for intervention efforts, and other research purposes.

Item intensities values on the total scale ranged from 1.14 to 2.95. Item discrimination values on the total scale ranged from 0.36 to 0.58 (CTT) and 0.75 to 1.89 (IRT), respectively. Internal consistency reliability for the total scale met the criterion for use for decisions about individuals ( $\alpha = 0.93$ ). Subscale reliabilities ranged from 0.78 to 0.87, with values of as follows: Aggression-Defiance = 0.82, Depression-Anxiety = 0.87, Substance Abuse = 0.78, Peer Deviance = 0.83, Family Environment 0.79, and School Engagement = 0.84. Subscale scores have lower reliability values compared to the total score, as expected. Subscales typically demonstrate lower reliability estimates, given shorter scale length, reduced variability, and a select area of the distribution each targets.

### Concurrent Validity

Two-hundred and forty-four students from several local alternative high schools participated in the concurrent validity study of the WARNS. The Problem-Oriented Screening Instrument for Teenagers (POSIT) (National Institute of Health, 2009,) was chosen as a comparison instrument. The POSIT is generally used for youth who have already proven to be at-risk for poor outcomes, and is used to identify specific areas of need. The full POSIT is a 139-item yes/no scale consisting of 10 complete subscales, including substance abuse, mental health, family relations, peer relations, educational status, vocational status, social skills, leisure and recreation, and aggressive/delinquent behavior. Four scales that had no counterpart on the WARNS (Vocational Status, Leisure/Recreation, Physical Health and Social Skills) were removed for the purposes of the present study. The remaining six subscales that resembled the WARNS subscales were: Aggressive Behavior/Delinquency; Mental Health; Substance Use and Abuse; Peer Relations; Family Relations, and Educational Status. This left a total of 93 dichotomous items on the POSIT (yes = 1, no = 0) compared to 50 four-point Likert-scale items on the WARNS (Never or hardly ever = 0, Sometimes = 1, Often = 2, Always or Almost always = 3).

**Exhibit 3.3.** Pearson *r* Correlations between POSIT subscales and WARNS subscales

		POSIT SUBSCALES					
		Aggressive Behavior Delinquency	Mental Health	Substance Use and Abuse	Peer Relations	Family Relations	Educational Status
WARNS SUBSCALES	Aggression Defiance	<b>0.76</b> ( <i>p</i> <.01)	0.54 ( <i>p</i> <.01)	0.49 ( <i>p</i> <.01)	0.61 ( <i>p</i> <.01)	0.38 ( <i>p</i> <.01)	0.50 ( <i>p</i> <.01)
	Depression Anxiety	0.49 ( <i>p</i> <.01)	<b>0.77</b> ( <i>p</i> <.01)	.40 ( <i>p</i> <.01)	0.53 ( <i>p</i> <.01)	0.45 ( <i>p</i> <.01)	0.60 ( <i>p</i> <.01)
	Substance Abuse	0.43 ( <i>p</i> <.01)	.31 ( <i>p</i> <.01)	<b>0.86</b> ( <i>p</i> <.01)	0.45 ( <i>p</i> <.01)	0.25 ( <i>p</i> <.01)	0.22 ( <i>p</i> <.01)
	Peer Deviance	0.63 ( <i>p</i> <.01)	0.48 ( <i>p</i> <.01)	0.47 ( <i>p</i> <.01)	<b>0.71</b> ( <i>p</i> <.01)	0.33 ( <i>p</i> <.01)	0.44 ( <i>p</i> <.01)
	Family Environment	0.40 ( <i>p</i> <.01)	0.52 ( <i>p</i> <.01)	0.28 ( <i>p</i> <.01)	0.46 ( <i>p</i> <.01)	<b>0.75</b> ( <i>p</i> <.01)	0.45 ( <i>p</i> <.01)
	School Engagement	0.50 ( <i>p</i> <.01)	0.44 ( <i>p</i> <.01)	0.33 ( <i>p</i> <.01)	0.41 ( <i>p</i> <.01)	0.44 ( <i>p</i> <.01)	<b>0.50</b> ( <i>p</i> <.01)

Exhibit 3.3 presents the correlations among subscale scores on the WARNS and the POSIT. The correlations between five of the six paired subscales were very strong and highly significant. The WARNS demonstrated very high concurrent validity with on the POSIT on the Aggression-Defiance, the Depression-Anxiety, the Substance Abuse and the Family Environment Scales. At .71, the Peer Deviance Scale was also highly correlated with the Peer Relations Scale on the POSIT.

On other hand, the WARNS School Engagement scale and the POSIT Educational Status scale showed only a low to moderate (.50) correlation. The best explanation for this discrepancy is that these scales do not measure the same thing, and thus the low correlation is not unexpected. As Exhibit 3.4 shows, the WARNS School Engagement scale clearly measures just that – enjoyment of school, relationships with teachers and other aspect of what is commonly thought of as school engagement. The POSIT Educational Status scale, on the other hand, is more geared towards learning disabilities and experiences in school with a focus on the negative. Therefore it is not surprising that these two scales are not highly correlated.

**Exhibit 3.4.** Item comparison between the WARNS School Engagement Scale and the POSIT Educational Status scale

WARNS	POSIT
<p><b>SCHOOL ENGAGEMENT – 9 items</b></p> <p>1. I liked going to school</p> <p>17. I learned things in class that will be important later in life</p> <p>26. I thought about dropping out of school</p> <p>44. My classes were interesting</p> <p>23. I studied for my quizzes and tests</p> <p>32. I got my homework completed and turned in on time</p> <p>8. I felt supported and respected by the adults at school</p> <p>13. I could talk to an adult at school if I had a problem</p> <p>42. My teachers cared about me</p>	<p><b>EDUCATIONAL STATUS – 15 items</b></p> <p>109. Do you have a hard time following directions? (and C)</p> <p>24. Are you a good listener?</p> <p>33. Are you a good speller?</p> <p>41. Do you get As and Bs in some classes and fail others?</p> <p>46. Are you a good reader?</p> <p>52. Have you ever read a book cover to cover for your own enjoyment?</p> <p>72. Is it easy to learn new things?</p> <p>103. Do you have trouble with written work?</p> <p>113. Do you have a good memory?</p> <p>116. Do you have a hard time planning and organizing?</p> <p>117. Do you have trouble with math?</p> <p>121. Does school sometimes make you feel stupid?</p> <p>130. Do you feel you study longer than your classmates and still get poorer grades?</p> <p>133. Is school hard for you?</p> <p>137. Do you have trouble finding the right words to express what you are thinking?</p>

**Test-retest Score Reliability**

Since the WARNS may contribute to decisions to place examinees in long-term intervention programs, it is desirable to have evidence of strong degrees of stability in test scores. In most situations where the WARNS test is applicable, the test administrators would be concerned with how consistently examinees respond to the WARNS at different times. The primary concern would be the measurement errors attributed to the fluctuations in an examinee’s observed score around their true score because of temporary changes in the examinee’s state. However, errors in test administration, test scoring, marking by examinees,

and other temporary fluctuations in behavior may also impact observed scores. In order to estimate the impact of these errors on test score reliability, the test-retest method is utilized. Ninety-five students at a local Skills Center (alternative high school) completed the WARNS assessment with an interim period of one week (7 days). The test-retest reliability estimate for the Total score (all sub-scales combined) was highly significant (.90). The sub-scale scores had reliability estimates ranging from moderate (.65) to highly significant (.91) with a median reliability estimate of .83. The details are in [Exhibit 3.5](#).

**Exhibit 3.5.** Results of test-retest reliability for each subscale of the WARNS, taken exactly 1 week (7 days) apart

WARNS total and subscales	Test-re-test Correlation Coefficients
<b>Total</b>	<b>.90, p &lt;.01</b>
Aggression/Defiance	.79, p <.01
Depression/Anxiety	.86, p <.01
Substance Abuse	.65, p <.01
Peer Deviance	.82, p <.01
Family Environment	.91, p <.01
School Engagement Pre-test	.83, p <.01

### Inter-rater Agreement

Due to time constraints, one topic that was not included in the current series of studies was the assessment of inter-rater reliability to determine if a youth and parent agreed about the youth’s experiences. We relied on the evidence from the 2012 studies to document this form of agreement. During development of the WARNS, a parent version of the assessment was created to assess inter-rater agreement and gather additional data about a youth’s prior experiences and current functioning.

Scales were identical on the youth and parent versions with the exception of the pronouns referring to the youth. While youth and parent perspectives often differ with respect to an individual’s emotions and behaviors, the correlation of the two respondents on the same scale is expected to be higher than the correlation of different scales. For example, a parent’s rating of a youth’s depression should be more strongly related to the youth’s rating of depression than the youth’s rating of school engagement. Inter-rater correlations for valid psychological assessments typically range from 0.50 - 0.70.

[Appendix H](#) presents the inter-rater correlations for the 318 sets of youth and parent assessments on the Needs Scales. Correlations between youths and parents ranged from 0.52 to 0.61 on the same scales, and in all instances the same-scale correlations were stronger than the cross-scale correlations (range = 0.16 - 0.45). These results again indicate good agreement of the WARNS.

In addition, five other WARNS items appeared on both the youth and parent questionnaires: *living with mom only, currently homeless, siblings dropped out of school, chronic health problems, and history of a disability or disorder*. The agreement of these items was assessed using percent agreement and Cohen’s kappa statistics. The percent agreement

ranged from 81% - 99%, and kappas ranged from 0.60 - 0.71, again indicating acceptable reliability (see [Appendix H](#)).

## Validation Evidence

### Internal Structure Evidence

Participants from 13 different sites across the state of Washington, including school districts and high schools were administered the WARNS. There were 1,997 adolescent participants aged 11 to 19 with 53.7% identifying as male and 44.7% identifying as Caucasian.

Evidence to support the test score structure of the WARNS instrument was collected via confirmatory factor analysis (CFA). A theory-driven analysis, CFA requires a priori specification of the relationship of indicators to underlying traits (items to domains). Specifically, CFA was used to test model-data fit of the WARNS's theoretical six-factor structure (i.e., the six domains such as aggression-defiance). The factor structure was examined in MPlus 7.1.1 (Muthén & Muthén, 1998-2012) with weighted least squares means and variance adjustment (WLSMV) estimation to account for ordinal data (e.g., data on a rating scale). The data were split into two random halves for cross-validation. Four models were tested on each half of the data to see which model was the best fit: a one-factor model (i.e., general need/risk factor), a six-factor model (i.e., the six domains), a higher-order model (i.e., the six first-order factors and one second-order factor), and a bi-factor model (i.e., six first-order factors and a separate general factor). Model fit was evaluated using a combination of fit indices. The standardized root mean square residual index (SRMR) and Root Mean Square Error of Approximation (RMSEA) were used with values < 0.08 suggesting good model fit; comparative fit index (CFI) values > 0.95 indicated good fit (Brown, 2006; Hu & Bentler, 1999).

Model fit statistics for each model across both halves of the data appear in [Exhibit 3.6](#). The factor pattern coefficients based on the bi-factor model appear in [Exhibit 3.7](#). The pattern coefficients represent the correlations within the WARNS and illustrate the relationships between items and the subscales. The bi-factor model was deemed best fitting for both halves of the data, which provides cross-validation evidence that the model fits well across samples and that the theoretical structure of the WARNS is supported. This structure supports the use of a total need/risk score as well as scores on the six domain factors.

**Exhibit 3.6.** Confirmatory Factor Analysis Fit Indices by Model and Halves

Model with First Half (N=434)	$\chi^2$	<i>df</i>	<i>p</i>	RMSEA	90% C.I.	CFI	SRMR	WRMR
1-factor	4,351.772	740	< 0.01	0.106	0.103-0.109	0.673	0.137	2.934
6-factor	1,694.422	725	< 0.01	0.056	0.052-0.059	0.912	0.081	1.598
Higher-order	1,889.810	734	< 0.01	0.060	0.057-0.064	0.895	0.090	1.785
Bi-factor	1,622.165	700	< 0.01	0.055	0.052-0.059	0.917	0.079	1.537
Model with Second Half (N=433)								
1-factor	4,360.287	740	< 0.01	0.106	0.103-0.109	0.648	0.133	2.931
6-factor	1,686.454	725	< 0.01	0.055	0.052-0.059	0.906	0.078	1.565
Higher-order	1,927.550	734	< 0.01	0.061	0.058-0.065	0.884	0.088	1.785
Bi-factor	1,676.326	700	< 0.01	0.057	0.053-0.060	0.905	0.077	1.545

Note: Bi-factor Model deemed best fitting for both halves of the data.

**Exhibit 3.7.** Factor Pattern Coefficients for the Six-dimensional Bi-factor Structure of the WARNS

Item	Need (Total)	Factor					
		Aggression-Defiance	Depression-Anxiety	Substance Abuse	Peer Deviance	Family Environment	School Engagement
1	0.373						0.515
2	0.474	0.275					
3	0.559					0.573	
4	0.437					0.544	
5	0.524	0.573					
6	0.459						0.599
7	0.432		0.651				
8	0.673				0.392		
9	0.414						0.523
10	0.387		0.759				
11	0.520			0.482			
12	0.409		0.675				
13	0.310						0.590
14	0.580				0.568		
15	0.569					0.126	
16	0.526			0.480			
17	0.415						0.525
18	0.683	0.439					
19	0.507		0.667				
20	0.656						0.105
21	0.632	0.335					
22	0.598					0.598	
23	0.443		0.590				
24	0.490				0.593		
25	0.418		0.708				
26	0.445						0.485
27	0.552			0.540			
28	0.564				0.424		
29	0.487	0.538					
30	0.352		0.623				
31	0.527			0.687			
32	0.676		0.323				
33	0.583			0.606			
34	0.626	0.469					
35	0.405						0.637
36	0.607	0.355					
37	0.366						0.621
38	0.661	0.288					
39	0.593				0.429		
40	0.431					0.622	

### **Measurement Invariance and Issues of Fairness**

The evaluation of items for item bias, differential item functioning (DIF), was examined to ensure fairness in scores derived from the instrument. DIF analysis ensures that students of equal need/risk from different groups (e.g., gender, race/ethnicity) have the same chance of exhibiting risk or no risk as measured by the WARNS. In other words, users can be confident identification of students for intervention is based on true differences in the measured traits and not a students' affiliation with a group (AERA, APA, & NCME, 2014). DIF was examined across groups (i.e., boys vs. girls; Caucasian vs. Latino; Caucasian vs. other groups) using logistic regression (LR) on the total scale and each subscale. To classify an item as exhibiting DIF, the chi-square ( $\chi^2$ ) difference test was used to compare models as variables were entered into the model; an ordinal  $R^2$  value was used as an effect size measure. A significant  $\chi^2$  difference test and  $R^2_{difference} \geq 0.130$  were used as criteria to identify DIF items (Zumbo, 1999).

None of the items on the WARNS exhibited DIF of concern in any group comparison. This finding provides evidence that students who are assessed for risk using the WARNS instrument are identified for risk and intervention based on true differences in the measured traits and not their group affiliations.

### **Multi-group CFA**

Another method for investigating measurement invariance and ensuring comparable measurement across groups is to test the fit of the factor structure across the same groups employed in the DIF analyses. Multi-group confirmatory factor analysis (MCFA) is a popular method for examining factor invariance and can be used to detect invariance for test items. MCFA requires certain parameters, such as the factor loadings, to be constrained (i.e., fixed) equal across groups in order to ensure that the model fits both groups equally (i.e., the model does not favor or fit one group over the others). Two sets of analyses were conducted in which the model was fit across two groups at a time. The first analysis constrained parameters across gender (male and female), and the second analysis constrained parameters across ethnicity (Caucasian and Hispanic). Each analysis had a baseline model (i.e., no constraints in the model) and a fully constrained model. The fit for the fully constrained model is expected to be worse, yet not significantly different from the baseline model if the model is invariant across groups. Model fit was evaluated using a combination of fit indices. The Root Mean Square Error of Approximation (RMSEA) was used with a value of  $< 0.08$  suggesting good model fit, the comparative fit index (CFI) with a value of  $> 0.95$  indicated good fit (Brown, 2006; Hu & Bentler, 1999), and the Weighted Root Mean Square Residual (WRMR) with values  $\leq 1.00$  indicating good fit. The Chi-square Difference Test allows for model comparisons to see if the change between models is great enough to determine whether the model is invariant across groups or not. The results from these analyses can be seen in [Exhibit 3.8](#). The models across group comparisons were deemed to be invariant indicating that the WARNS structure and resulting scores work equally well across these groups.

**Exhibit 3.8.** Multi-group Confirmatory Factor Analysis Bi-factor Model Fit Indices

Group	$\chi^2$	<i>df</i>	<i>p</i>	RMSEA	90% C.I.	CFI	WRMR
<b>Gender</b>							
Female	1,361.295	700	< 0.01	0.053	0.049-0.057	0.928	1.298
Male	1,597.473	700	< 0.01	0.056	0.052-0.059	0.903	1.399
Combined Baseline	2,945.280	1,400	< 0.01	0.054	0.051-0.057	0.916	1.908
Combined Constrained	2,977.520	1,546	< 0.01	0.050	0.047-0.052	0.922	2.016
<b>Race/Ethnicity</b>							
Caucasian	1,243.888	700	< 0.01	0.052	0.047-0.057	0.937	1.207
Hispanic	1,386.860	700	< 0.01	0.055	0.050-0.059	0.903	1.339
Combined Baseline	2,633.231	1,400	< 0.01	0.053	0.050-0.057	0.922	1.803
Combined Constrained	2,785.210	1,546	< 0.01	0.051	0.048-0.054	0.922	1.956

**Known Group Differences**

Validity evidence based on differences across known groups (e.g., a previous arrest vs. no arrest) supports the instrument's ability to identify youth for maladaptive behaviors (AERA, APA, & NCME, 2014). Outcomes of higher risk of maladaptive behaviors (e.g., aggression) are expected for students with certain characteristics such as those who may have been arrested or suspended. Known-group mean differences were conducted using independent *t*-tests to examine students' total and domain scores between groups of students who had been suspended (fewer than two times vs. three or more times) and/or arrested (never arrested vs. arrested). Affiliated effect sizes (*d*) were defined as small (0.2), medium (0.4), and large (0.8) (Cohen, 1988).

Data met normality and homogeneity of variance assumptions in all but a few *t*-test analyses and robust tests were employed as needed. The results indicated that students who had been suspended three or more times and students who had been arrested exhibited significantly higher means on all of the scales except the Depression-Anxiety and Family Environment scales, compared to students who had been suspended two or fewer times or had never been arrested. See [Exhibit 3.9](#) for results. Effect sizes ranged from 0.26 to 0.67 on significant differences.

**Exhibit 3.9.** Known Group Comparisons by Groups and Scales

Scale	Suspended ≤ 2 times			Suspended ≥ 3 times			t-value	p	df	d
	N	Mean	SD	N	Mean	SD				
Total	432	21.22	12.13	328	27.30	14.73	-6.08	< 0.01	624.49	0.46
Aggression-Defiance	432	3.29	3.07	328	5.77	4.45	-8.68	< 0.01	552.07	0.67
Depression-Anxiety	432	6.09	4.83	328	6.58	5.14	-1.34	0.179	758.00	0.10
Substance Abuse	432	1.25	2.01	328	2.23	2.73	-5.47	< 0.01	577.11	0.42
Peer Deviance	432	4.24	3.28	328	5.78	3.51	-6.22	< 0.01	758.00	0.46
Family Environment	432	6.34	3.92	328	6.93	3.86	-2.06	0.040	758.00	0.15
School Engagement	432	13.43	5.31	328	15.45	5.60	-5.07	< 0.01	758.00	0.37

Scale	Never arrested			Arrested			t-value	P	df	d
	N	Mean	SD	N	Mean	SD				
Total	440	21.32	12.46	320	27.31	14.43	-5.99	< 0.01	625.35	0.45
Aggression-Defiance	440	3.63	3.52	320	5.36	4.22	-5.96	< 0.01	609.71	0.45
Depression-Anxiety	440	6.03	4.90	320	6.67	5.04	-1.74	0.082	758.00	0.13
Substance Abuse	440	1.07	1.75	320	2.51	2.87	-7.97	< 0.01	489.97	0.63
Peer Deviance	440	4.23	3.29	320	5.84	3.48	-6.50	< 0.01	758.00	0.48
Family Environment	440	6.35	3.98	320	6.93	3.77	-2.04	0.042	758.00	0.15
School Engagement	440	13.70	5.56	320	15.13	5.38	-3.57	0.004	758.00	0.26

**Classification Analysis**

To see how effective the WARNS may be at discerning between adolescents based on need for intervention, total scores were examined in tandem with student arrest and suspension records. Logistic regression analyses were undertaken to attempt to identify “cut scores” above which respondents would be much more likely to have a suspension or arrest on their record. Respondents with total scores above the cut score were labeled *at-risk*, suggesting a need for intervention. Cut scores were evaluated in terms of a) resulting sensitivity and specificity estimates and b) the areas under the Receiver-operating characteristic (ROC) curve. Sensitivity concerns the ability of an instrument to detect individuals who may be at risk for a certain outcome—suspension or arrest, in the current analysis. Sensitivity levels should exceed 70% (Distefano & Kamphaus, 2007). Specificity describes the capability of an instrument to limit the amount of “false-positives”. ROCs plot all potential pairs of sensitivity-specificity outcomes obtained from the logistic regression analysis (Zweig & Campbell, 1993). An area under an ROC may be calculated to obtain an overall estimate of how accurately a test classifies individuals. Areas may range from .5 to 1.0, with the top end of the range indicating a test of perfect discriminating capability.

Male (n=1,007) and female (n=851) respondents were analyzed separately, which produced a slight improvement in overall sensitivity and specificity estimates relative to analyses of the whole sample. This methodology was also consistent with prior investigation of risk prediction from WARNS scores (George, 2012). Among male respondents, 42% had record of a suspension and 40% had been arrested. Among female respondents, 25% had been suspended and 27% had record of an arrest.

In the logistic regression analyses, either a suspension (1=had been suspended at least once) or arrest (1=had been arrested at least once) variable was entered as the dependent

variable. The total WARNS score served as the sole predictor in each model. In each analysis, a potential cut score was identified at a point that achieved an optimum predictive balance—high sensitivity estimates without sacrificing too much specificity. This process was then repeated by looking across the two analyses within each gender. The final selected cut scores were 17 for boys and 20 for girls. [Exhibit 3.10](#) displays the sensitivity and specificity estimates associated with these cut scores. Areas under the ROCs ranged from 0.645 to 0.685. These areas are comparable to the results obtained from previous investigation of the classification accuracy of the WARNS. In that investigation, scores on subsets of the Needs scales and various responses to items related to behaviors and experiences (e.g., number of times in detention overnight) were entered into equations to predict criminal offense outcomes. Areas under the ROC curves in this analysis ranged from 0.64 to 0.67.

**Exhibit 3.10.** Sensitivity and specificity estimates (%) for WARNS total cut scores

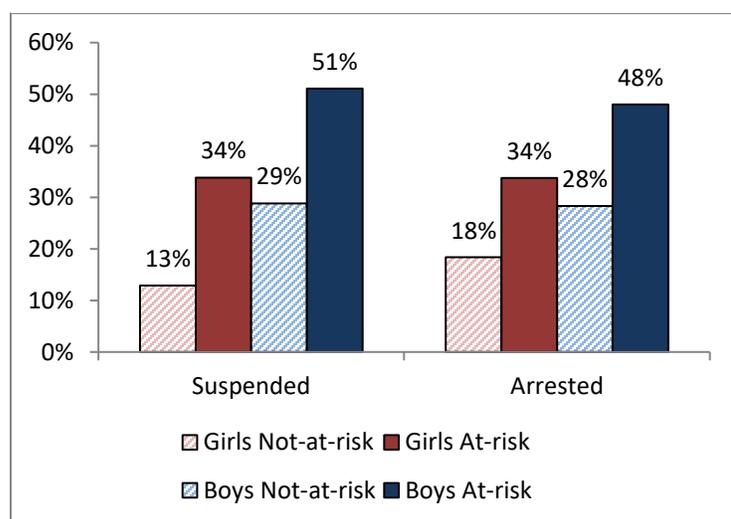
Outcome	Boys		Girls	
	Sensitivity	Specificity	Sensitivity	Specificity
Suspension	73	49	77	51
Arrest	72	48	70	50

\*Cut score for boys = 17; cut score for girls =20

[Exhibit 3.11](#) displays the percentages of respondents who would be labeled at-risk according to their WARNS total score against actual records of suspension or arrest. Across boys and girls, there were higher proportions of at-risk respondents with a suspension or arrest on their record than respondents with total scores falling below the cut score. However, there were also relatively large proportions of suspensions and arrests among these respondents categorized as *not* at-risk. For example, among male respondents with a cut score above 17, 51% had been suspended at least once, but 29% below the cut score also had a record of suspension.

In general, it seems that while some uses of a total score on the WARNS may be justified (e.g., comparing groups, creating norms, research purposes) such a score is not very powerful for identifying risk of suspension or arrest. To examine ways in which the WARNS may support prediction of such outcomes, it might be best to focus on the domain level, and isolate the domain scores (e.g., aggression-defiance) that should theoretically demonstrate the highest degree of association with the arrest outcome. Then the process could

**Exhibit 3.11.** Percentages of adolescents with suspension and arrest records by risk category.



be repeated with a new set of domain scores for the suspension outcome. Such analyses would need guidance from content experts. Options for obtaining predictive evidence outside the existing data set should be considered as well. Perhaps the best predictive evidence would come from a survey of the general student population in the appropriate grades with queries of the educational and court system databases at one, two, and maybe even five years after survey administration to track the outcomes of respondents.

## Ongoing Research

Research on the WARNS is ongoing. Recent publications have established additional evidence for the strength and validity of the instrument. Iverson et al., (2016) provided empirical evidence for distinct profiles that can be used to make decisions about youths. Strand et al., (2017) examined the factor structure and invariance of the six Risks and Needs domains across various groups such as sex, and race/ethnicity. We are confident that further research will continue to provide solid evidence for the use of the assessment tool across a broad population.

### Summary of Test Reliability and Validation Evidence

Evidence demonstrates that the WARNS scores have strong reliability. The scores have:

- High internal consistency.
- A high degree of test-retest reliability.
- A high degree of inter-rater reliability.

Evidence demonstrates that:

- Test content in the WARNS is supported.
- The WARNS factor structure is supported.
- The WARNS items function similarly across major identified groups.
- Correlations with external variables reveal that WARNS scores are correlated as expected with other measures.
- The WARNS scores show expected differences in expected groups.

Major forms of reliability and validity evidence were provided to support the WARNS scores and inferences. However, exhaustive validity evidence is impossible to collect given (a) building validity evidence is an ongoing process, (b) an assessment program or assessment developer cannot foresee all uses of the scores, and (c) a test developer cannot predict every type of child that may be assessed. However, the evidence we do present provides a strong foundation for the use of the WARNS.

## References

- Achenbach, T. M. & Edelbrock, C. S. (1991). *Manual for the Child Behavior Checklist and Revised Child Behavior Profile*. Burlington, Vermont: University of Vermont, Department of Psychology.
- American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. Washington, D. C.: American Educational Research Association.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Barnoski, R. (2004). *Washington State Juvenile Court Assessment Manual, Version 2.1*. Olympia, WA: Washington State Institute for Public Policy.
- Brown, T.A. (2006). *Confirmatory Factor Analysis for Applied Research*. New York: The Guilford Press.
- Butcher, J. N., Williams, C. L., Graham, J. R., Archer, R. P., Tellegen, A., Ben-Porath, Y. S., Kaemmer, B. (2006). *Minnesota Multiphasic Personality Inventory – Adolescent*. San Antonio, TX: Pearson.
- Centre for Addiction and Mental Health (2009). Screening for Concurrent Substance use and Mental Health Problems in Youth.  
[http://www2.massgeneral.org/allpsych/pediatricsymptomchecklist/psc\\_home.htm](http://www2.massgeneral.org/allpsych/pediatricsymptomchecklist/psc_home.htm).
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.
- Distefano, C., & Kamphaus, R. W. (2007). Development and validation of a behavioral screener for preschool-aged children. *Journal of Behavioral and Emotional Disorders*, 15(2), 93-102.
- Dennis, M. L., White, M. K., Titus, J.C., & Unsicker, J. I. (2006). *Global Appraisal of Individual Needs (GAIN): Administration guide for the GAIN and related measures (Version 5)*. Bloomington, IL: Chestnut Health Systems.
- Egger, H. L., Costello, E. J., & Angold, A. (2003). School refusal and psychiatric disorders: A community study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42(7), 797 – 807.

- Elliott, D. S., & Menard, S. (1996). Delinquent friends and delinquent behavior: Temporal and developmental patterns. In J. D. Hawkins (Ed.), *Delinquency and crime: Current theories* (pp. 28 – 67). New York: Cambridge University Press.
- George, T. (2011). *Truancy in Washington State: Trends, student characteristics, and the impact of receiving a truancy petition*. Olympia: Washington State Center for Court Research.
- George, T.P. (2012) Washington Assessment of the Risks and Needs of Students (WARNS): User Manual.
- Goodman R., Meltzer H., & Bailey V. (1998). The Strengths and Difficulties Questionnaire: A pilot study on the validity of the self-report version. *European Child and Adolescent Psychiatry, 7*, 125-130.
- Gorman-Smith, D., Tolan, P. H., Loeber, R., & Henry, D. B. (1998). Relation of family problems to patterns of delinquent involvement among urban youth. *Journal of Abnormal Child Psychology, 26*(5), 319 – 333.
- Hammond, C., Linton, D., Smink, J., & Drew, S. (2007). *Dropout Risk Factors and Exemplary Programs: A Technical report*. Clemson, S.C.: National Dropout Prevention Center, Clemson University, and Alexandria, VA: Communities In Schools, Inc.
- Henry K. L. (2007). Who's skipping school: Characteristics of truants in 8th and 10<sup>th</sup> grade. *Journal of School Health, 77*, 29–35.
- Henry K. L., Huizinga D. H. (2007). Truancy's effect on the onset of drug use among urban adolescents placed at risk. *Journal of Adolescent Health, 40* (4), e9–e17.
- Henry, K. L., Thornberry, T. P., & Huizinga, D. H. (2009). A discrete-time survival analysis of the relationship between truancy and the onset of marijuana use. *Journal of Studies on Alcohol and Drugs, 70*, 5 – 15.
- Hinden, B., Compas, B., Achenbach, T., & Howell, D. (1997). Covariation in the anxious-depressed syndrome: Separating fact from artifact. *Journal of Consulting and Clinical Psychology, 65*, 6-14.
- Howell, J. C. (2003). *Preventing and reducing juvenile delinquency: A Comprehensive framework*. Thousand Oaks, CA: Sage.
- Hu, L. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.

- Iverson, A., French, B. F., Strand, P. S., Gotch, C. M., & McCurley, C. (2016). Understanding School Truancy Risk–Need Latent Profiles of Adolescents. *Assessment*, 1073191116672329.
- Jaycox, L. H., Stein, B. D., Paddock, S., Miles, J. N. V., Chandra, A., Meredith, L. S., Tanielian, T., Hickey, S., & Burnam, M. A. (2009). Impact of teen depression on academic, social, and physical functioning. *Pediatrics*, 124 (4), e596 -e605.
- Kane, M. T. (2006). Validation. In *Educational Measurement*, American Council on Education / Praeger Series on Higher Education (4th ed., pp. 17-64). Westport, CT: Praeger Publishers.
- Loeber, R. (1990). Development and risk factors of juvenile antisocial behavior and delinquency. *Clinical Psychology Review*, 10, 1 – 41.
- Loeber, R., & Farrington, D. P. (Eds.) (1998), *Serious and violent juvenile offenders: Risk factors and successful interventions*. Thousand Oaks, CA: Sage.
- Loeber, R., & Stouthamer-Loeber, M. (1986). Family factors as correlates and predictors of juvenile conduct problems and delinquency. *Crime & Justice*, 7, 29 – 149.
- McAra, L. (2004). *Truancy, school exclusion, and substance misuse: The Edinburgh study of youth transitions and crime, no. 4*. Edinburgh, Scotland: Centre for Law and Society, the University of Edinburgh.
- McNeal, R. B. (1999). Parental involvement as social capital: Differential effectiveness on science achievement, truancy, and dropping out. *Social Forces*, 78, 117–144.
- Muthén, L.K. and Muthén, B.O. (1998-2012). *Mplus User's Guide*. Seventh Edition. Los Angeles, CA: Muthén & Muthén.
- National Center for School Engagement (2004). *Student survey, version 2*. Denver CO: National Center for School Engagement.
- Nunnally, I. H., & Bernstein, I. H. (1994). *Psychometric Theory*. New York: McGraw-Hill.
- Rahdert, E. (1991). *The problem oriented screening instrument for teenagers*. Bethesda, MD: National Institute on Drug Abuse.
- Reynolds, W. M. (2002). *Reynolds adolescent depression scale (2<sup>nd</sup> ed.)* Lutz, FL: Psychological Assessment Resources.

- Strand, P. S., Gotch, C. M., French, B. F., & Beaver, J. L. (2017). Factor Structure and Invariance of an Adolescent Risks and Needs Assessment. *Assessment*, 1073191117706021.
- Wood, J. J., Lynne-Landsman, S. D., Langer, D. A., Wood, P. A., Clark, S. L., Eddy, J. M., & Ialongo, N. (2011). School attendance problems and youth psychopathology: structural cross-lagged regression models in three longitudinal data sets. *Child Development*, 83(1), 351 – 366.
- Zumbo, B.D. (1999). *A Handbook on the Theory and Methods of Differential Item Functioning (DIF): Logistic Regression Modeling as a Unitary Framework for Binary and Likert-Type (Ordinal) Item Scores*. Ottawa, ON: Directorate of Human Resources Research and Evaluation, Department of National Defense.
- Zweig, M. H., & Campbell, G. (1993). Receiver-operating characteristic (ROC) plots: A fundamental evaluation tool in clinical medicine. *Clinical chemistry*, 39, 561-577.

## Appendices

- Appendix A:** WARNS User Agreement – See [WARNS.wsu.edu](http://WARNS.wsu.edu)
- Appendix B:** Parent Consent Form – See [WARNS.wsu.edu](http://WARNS.wsu.edu)
- Appendix C:** Student Consent Form – See [WARNS.wsu.edu](http://WARNS.wsu.edu)
- Appendix D:** Range of Corrected Item-Total Correlations, Scale Means, Scale Standard Deviations, and the Percentage of Students within each Needs Category for the WARNS Social and Emotional Needs Scales for the Full High School and Truant Samples
- Appendix E:** Results of Initial Factor Analysis and Internal Reliability Analysis of Initial Pilot Study Conducted in the Fall of 2009 with 669 High School Students
- Appendix F:** Detailed Results of 2009 Reliability and Validity Study with 964 Truant Adolescents Needs Scales
- Appendix G:** Analytic Details for the Early Predictive Validity Study Carried out in 2009 (n = 964)
- Appendix H:** Inter-Rater Reliability (Correlations) of the WARNS Youth Report and Parent Report (n = 312 pairs)
- Appendix I:** Results of the Principal Components Analysis of the WARNS Social and Emotional Needs Items with a High School Sample
- Appendix J:** Internal Consistency (alphas) of the WARNS Social and Emotional Needs Scales
- Appendix K:** Results of the Principal Components Analysis of the WARNS Social and Emotional Needs Items with a Truant Sample

**Appendix D.** Range of Corrected Item-total Correlations, Scale Means, Scale Standard Deviations, and the Percentage of Students within each Needs Category for the WARNS Social and Emotional Needs Scales for the Full High School and Truant Samples.

	Aggression-Defiance (8 items)	Depression-Anxiety (8 items)	Substance Abuse (5 items)	Peer Deviance (5 items)	Family Environment (5 items)	School Engagement (9 items)
<b>High School Sample (n = 615)</b>						
Range of corrected item- total correlations	.43 - .63	.55 - .73	.56 - .66	.60 - .74	.45 - .68	.39 - .68
Scale mean	3.98	6.42	1.20	4.45	5.80	12.28
Scale standard deviation	3.92	5.08	2.58	3.64	3.87	5.75
Needs Classifications	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>
Low:	74% 58%	51% 65%	79% 76%	58% 51%	56% 63%	71% 58%
Moderate:	13% 21%	26% 18%	11% 12%	29% 33%	22% 19%	15% 18%
High:	13% 21%	23% 17%	10% 12%	13% 16%	22% 19%	15% 25%
<b>Truant Sample (n = 939)</b>						
Range of corrected item- total correlations	.48 - .67	.53 - .71	.54 - .63	.60 - .69	.40 - .70	.42 - .65
Scale mean	4.21	6.37	1.64	4.29	6.18	14.58
Standard deviation	3.96	5.01	2.41	3.42	3.91	5.66
Needs Classifications	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>	<u>Females</u> <u>Males</u>
Low:	64% 64%	50% 66%	71% 75%	57% 58%	49% 58%	43% 44%
Moderate:	17% 19%	22% 18%	18% 16%	30% 31%	24% 25%	24% 27%
High:	19% 17%	29% 14%	11% 9%	13% 11%	27% 17%	32% 29%

**Appendix E:** Results of initial Factor Analysis and Internal Reliability analysis of initial pilot study conducted in the fall of 2009 with 669 high school students

### Factor Analysis

Following the high school administration, data were used for item analysis for all the questions on the WARNS. Items with little variation were later reworded or removed from the instrument. Next, a series of exploratory factor analyses (principal components analyses with varimax rotation) were conducted to determine if the items hypothesized to form the eight WARNS social and emotional Needs Scales grouped together in a distinct manner. Inspection of the eigenvalues indicated that eight factors had an eigenvalue greater than 1.0 and accounted for 62% of the variance. However, a seven-factor solution best represented the underlying constructs and accounted for nearly the same amount of variance (59%). The seven-factor solution consisted of a combined Aggression-Defiance scale and a combined Depression-Anxiety scale, as well as the Substance Abuse, Peer Deviance, and Family Environment scales. The School Engagement scale separated into two distinct but theoretically related scales, one of which primarily addressed relationships with teachers and adults at school and the other focusing on school engagement in terms of interest and enjoyment in the learning process. However, because of the strong theoretical and empirical relationship between the two scales, the decision was made to retain these items as one School Engagement scale.

Thus, the final six social and emotion Needs Scales, which accounted for 57% of the variance, were Aggression-Defiance, Depression-Anxiety, Substance Abuse, Peer Deviance, Family Environment, and School Engagement. The factor analysis was repeated forcing a six-factor solution, and the factor loadings are presented in Appendix L. Nearly all items had factor loadings above .40 on the hypothesized scale, while not loading highly on the other factors. Two items on the Peer Deviance scale also loaded highly on another scale: “My friends got into physical fights” had a loading of .62 on Peer Deviance and .46 on Aggression-Defiance, and “My friends got drunk or high” had a loading of .69 on Peer Deviance and .40 on Substance Abuse. Only one item, “I thought about dropping out of school,” loaded highly on a scale other than its own (.54 on Aggression-Defiance and .24 on School Engagement). For theoretical reasons, however, this item was maintained on the School Engagement scale.

### Internal Reliability

The next step in the process involved an analysis of the internal reliability of the items forming each scale. The reliability of an assessment instrument refers to the consistency of scale items in measuring the underlying construct, and it is a necessary but not sufficient condition for an instrument’s validity. One method of assessing the reliability of scale items is through the inspection of corrected item-total correlations (i.e., the correlation of the item under examination with the total score of all the other items on the scale). The range of these correlations is presented for each scale in Appendix H. Moderate correlations are desirable as a low correlation indicates an item is not consistent with the other scale items, and a very high correlation suggests an item may be sufficient to represent the construct by itself. Across all six scales, corrected item-total correlations were acceptable, ranging from .39 - .74

An alpha coefficient is another common measure of the internal consistency of a scale. Alpha coefficients above .70 are generally considered acceptable, while those above .80 are considered good. The alpha coefficients for the six WARNS scales are presented for the full high

school sample, and separately for females, males, Hispanic students, and White students in Appendix M. For the full sample, alphas ranged from .79 on the Family Environment scale to .88 on the Depression-Anxiety scale, with an average value of .84. The only alpha that was just below an acceptable level was the Substance Abuse scale for Hispanics, which had a value of .68.

The final WARNS instrument consisted of 40 items composing the Needs Scales, and 38 items maintained for the prediction of risk, potential utility for intervention efforts, and other research purposes.

## **Appendix F: Detailed results of 2009 reliability and validity study with 964 truant adolescents**

### Factor Analysis

A factor analysis was performed to determine if the six-factor solution underlying the social and emotional needs items found among high school students would be replicated with the truant sample. Principal components analysis with varimax rotation (forcing a six-factor solution) was again performed on the full sample of truant youth. Results indicated that all six factors had eigenvalues greater than 1.0 and explained 56% of variance.

Factor loadings were then inspected to determine if each item loaded most highly with its hypothesized scale, and less so with the other scales. Appendix N presents the factor loadings for all items on each of the six scales (loadings of .40 or higher are presented in bold). Results were similar to those with the high school sample. The same two items from the Peer Deviance scale also loaded highly on one other scale each. In addition, the item, "I thought about dropping out of school," loaded slightly higher on Aggression-Defiance than School Engagement (.42 and .36, respectively). Finally, the item, "I got into arguments with my parents," loaded about equally on the Family Environment and Aggression-Defiance scales (.44 and .42, respectively). Thus, the factor analyses provided evidence for the validity of the social and emotional Needs Scales.

### Internal Reliability

Next, the reliability of the survey items was re-assessed for the truant sample. The range of corrected item-total correlations was .40 - .71, indicating an acceptable level of relationship between each item and its respective scale. In addition, alpha coefficients were also re-examined both in the full truant sample and in gender and racial/ethnic subgroups. For the full sample, alphas ranged from .76 on the Substance Abuse scale to .86 on the Depression-Anxiety scale, with an average of .82. Results were very similar for females and males (see Appendix I).

With respect to racial/ethnic groups, alphas were examined for American Indian, Asian/Pacific Islander, Black, Hispanic, and White youth. Across all groups and scales, alphas ranged from acceptable (.75) to very good (.91), with two exceptions. The reliability of the items on the Family Environment scale was .69 for Asian/Pacific Islanders, and the same was true on the Substance Abuse scale for Hispanics (.69). Overall, however, the results indicated that the six social and emotional Needs Scales had acceptable internal reliability across samples, genders, and races/ethnicities.

## **Appendix G:** Analytic details for the early predictive validity study carried out in 2009 (n = 964)

### Predictive Validity

To date, the predictive validity of the WARNS has been examined with respect to delinquency. The goal was to develop the most parsimonious prediction equation that could be easily calculated in the field and could significantly improve prediction over the fact that the youth had been identified as truant.

Prediction equations were developed separately for females and males. The dataset for the truant youth was first separated by gender and then randomly divided into two datasets for both females and males, each containing 50% of the sample. One sample (the “development” sample) was used to create the optimal prediction equation and scoring system which could reliably predict increased risk for subsequent delinquency. The second sample was used as the validation sample because development samples tend to overestimate predictive abilities (or “overfit” the data) and may not generalize to other groups. Delinquency was defined as any court referral for an At-Risk Youth petition or a criminal offense that occurred within either one or two years after the WARNS administration.

Development of the prediction equation began by inspecting score distributions for the six social and emotional Needs Scales and the other multiple-choice items. Next, a series of correlation, chi-square, and regression techniques were used to assess relationships among test items/scales and the outcome variables. The final predictive equation was selected based upon the overall strength of association with the dichotomous outcomes based upon the *area under the ROC curve* (AUC) as well as the distribution of scores across the sample.

The final prediction equations for females and males were fairly similar. Both equations had seven items and scales in common, though the scoring and weighting of the items and scales differed between the genders. Both equations included the Aggression-Defiance, Substance Abuse, and Peer Deviance scales, and the following four items: *number of prior arrests*, *number of times in detention overnight*, *frequency of skipping class*, and *number of lifetime suspensions/expulsions*. For females, the equation also included *recent grades* and the *frequency of babysitting or providing care for someone during school hours*. For males, the one additional item was *the number of times the youth ran away or was kicked out of the home*.

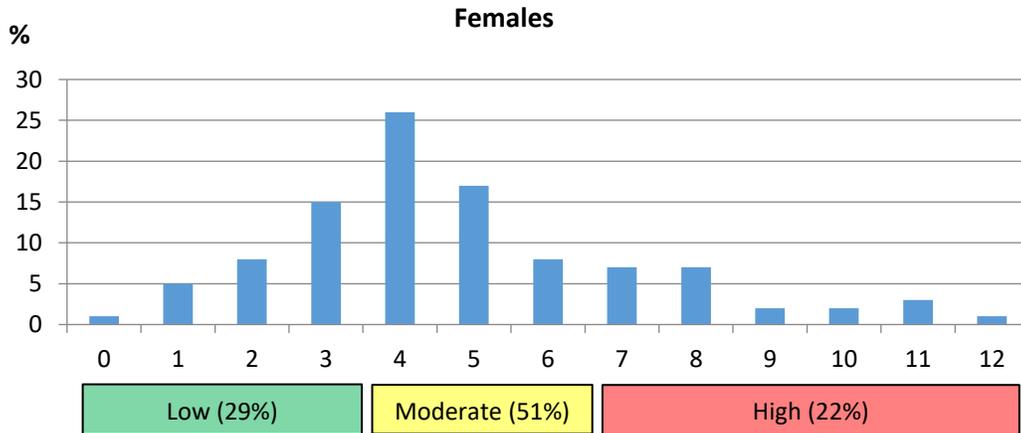
For females, risk scores ranged from 0 through 12, and for males the range was 0 through 8. Twenty-nine percent (29%) of the female truants were classified as low risk, 51% medium risk, and 22% high risk. For male truants, 49% were low risk, 38% medium risk, and 14% high risk.

For both females and males, a moderate association existed between WARNS risk scores and an ARY petition or criminal offense within either one or two years from the date of administration of the WARNS. For females, the correlation coefficients were .25 and .28 (after one year and two years, respectively) and the AUCs were .67 and .67. As seen in [Exhibit G.1](#), 7% of female truants categorized as low risk had an ARY petition or criminal offense after one year, and 11% after two years. The percentages were much higher among moderate (18%, 23%) and high risk (36, 46%) female truants.

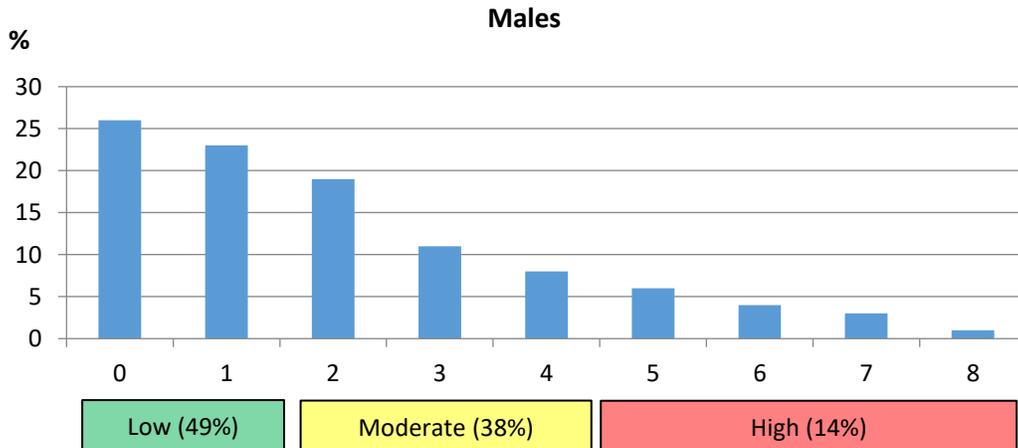
For males the correlation coefficients between WARNS risk scores and an ARY petition or criminal offense after one year and two years were .28 and .30, and the AUCs were .64 and .64. Twenty-two percent (22%) of low-risk male truants had an ARY petition or criminal offense

after one year, and 29% after two years. For moderate risk males ([Exhibit G.2](#)), the re-offense rates were 35% and 43%. And for male truants classified as high risk according to the WARNS risk equation, 60% had an ARY or criminal offense after one year and nearly three-quarters (74%) had a re-offense after two years.

**Exhibit G.1.** Percentage of Females with Different Risk Scores on the WARNS



**Exhibit G.2.** Percentage of Males with Different Risk Scores on the WARNS



**Appendix H.** Inter-rater Reliability (Correlations) of the WARNS Youth Report and Parent Report (n = 312 pairs)

	<u>Parent Report</u>						
	Aggression-Defiance	Depression-Anxiety	Substance Abuse	Peer Deviance	Family Environment	School Engagement	
<u>Youth Report</u>							
Aggression-Defiance	<b>.56</b>	.32	.35	.45	.32	.31	
Depression-Anxiety	.21	<b>.52</b>	.24	.16	.26	.25	
Substance Abuse	.29	.28	<b>.57</b>	.36	.24	.20	
Peer Deviance	.42	.20	.45	<b>.59</b>	.20	.25	
Family Environment	.29	.26	.16	.16	<b>.56</b>	.36	
School Engagement	.26	.25	.15	.27	.32	<b>.61</b>	

<u>Item:</u>	<b>Percent agreement:</b>	<b>Kappa coefficient:</b>
Living with mom only	81%	.60
Currently homeless	99%	.66
Siblings dropped out of school	86%	.71
Chronic health problems	89%	.68
History of a disability or disorder	86%	.69

**Appendix I. Results of the Principal Components Analysis of the WARNS Social and Emotional Needs Items with a High School Sample**

WARNS Social & Emotional Needs Items *Item reverse scored	<b>Aggress. - Defiance</b>	<b>Depress. - Anxiety</b>	<b>Subst. Abuse</b>	<b>Peer Deviance</b>	<b>Family Environ.</b>	<b>School Engage.</b>
45. Damaged or stole something on purpose	<b>.62</b>	.05	.35	.10	.10	.13
36. Picked on or bullied other kids	<b>.61</b>	.01	.21	.14	.11	.09
41. Got so angry hit or broke something	<b>.59</b>	.30	-.04	.19	.10	.11
43. Lied, hustled, conned to get what I wanted	<b>.57</b>	.11	.31	.09	.11	.04
24. Threatened to hurt someone	<b>.54</b>	.16	.21	.30	.14	.11
2. Got into physical fights	<b>.50</b>	.03	.18	.22	-.03	.12
7. Lost my temper and hit or yelled at someone	<b>.48</b>	.18	.07	.27	.19	.10
27. Lied, disobeyed, or talked back to adults	<b>.46</b>	.28	.15	.32	.27	.12
14. Sad, down, or unhappy.	.04	<b>.78</b>	.05	.07	.18	.13
31. Tense, irritated, or worried	.01	<b>.78</b>	.09	.12	.08	.03
25. Trouble sleeping or eating	.07	<b>.74</b>	.09	.18	.09	.04
16. Hard to concentrate	.12	<b>.70</b>	.11	.16	.10	.08
37. Sick, had trouble breathing, or felt shaky	.10	<b>.70</b>	.08	.11	.08	.02
9. Nothing could cheer me up	.13	<b>.69</b>	.05	.03	.17	.19
29. Hopeless about the future	.28	<b>.64</b>	.07	.00	.15	.05
39. Didn't care about anything or anyone	.38	<b>.52</b>	.09	.02	.18	.15
38. Missed school to use drugs/alcohol	.31	.07	<b>.78</b>	.00	.01	.04
22. Drank two or more alcoholic drinks in a day	.12	.13	<b>.75</b>	.31	.07	.15
15. Sick, passed out, or couldn't remember things	.23	.17	<b>.73</b>	.24	.03	.11
34. Used cocaine, meth, heroin, or pills	.30	.12	<b>.66</b>	.06	-.04	.08
19. My friends could have been arrested	.15	.15	.29	<b>.75</b>	.12	.18
3. My friends got into trouble at school	.35	.17	.05	<b>.71</b>	.04	.12
11. My friends got drunk or high	.05	.12	<b>.40</b>	<b>.69</b>	.07	.21
35. My friends skipped or cut class	.28	.13	.09	<b>.68</b>	.08	.12
47. My friends got into physical fights	<b>.46</b>	.13	-.04	<b>.62</b>	.01	.05
3. Felt close to my parents*	.06	.23	.15	.03	<b>.77</b>	.20
28. I could talk to my parents if I had a problem*	.10	.21	-.05	.09	<b>.73</b>	.33
5. Parents would help with homework if I asked*	.15	.18	-.01	.05	<b>.59</b>	.31
6. Parents' home a good place to do homework*	.27	.19	.02	.00	<b>.55</b>	.23
21. Got into arguments with my parents	.19	.33	-.04	.33	<b>.54</b>	-.10
44. My classes were interesting*	.12	.09	.05	.08	.03	<b>.76</b>
17. Learned things in class that will be important*	.02	.03	.09	.04	.08	<b>.76</b>
42. My teachers cared about me*	.02	.06	.13	.10	.19	<b>.75</b>
8. Felt supported/respected by adults at school*	.08	.10	.16	.16	.18	<b>.70</b>
1. Liked going to school*	.15	.13	.08	.07	-.01	<b>.66</b>
13. I could talk to an adult at school about problem*	-.02	.05	.05	.03	.25	<b>.62</b>
23. Studied for my quizzes and tests*	.24	.03	-.06	.10	.11	<b>.56</b>
32. Got my homework completed and turned in*	.36	.12	.02	.07	.12	<b>.48</b>
26. I thought about dropping out of school	<b>.54</b>	.30	.36	.04	.09	.24

**Appendix J.** Internal Consistency (alphas) of the WARNS Social and Emotional Needs Scales

<b>High School Sample</b>	<b>Sample Size:</b>	<b>Aggression- Defiance (8 items)</b>	<b>Depression- Anxiety (8 items)</b>	<b>Substance Abuse (5 items)</b>	<b>Peer Deviance (5 items)</b>	<b>Family Environment (5 items)</b>	<b>School Engagement (9 items)</b>
Full Sample	615	.82	.88	.82	.85	.79	.85
Females	308	.81	.89	.74	.87	.82	.83
Males	307	.84	.87	.86	.84	.77	.86
Hispanic	110	.84	.82	.68	.86	.82	.83
White	433	.80	.90	.80	.85	.80	.86
(insufficient sample size for other races)							
<b>Truant Sample</b>							
Full Sample	939	.84	.86	.76	.83	.80	.84
Females	423	.84	.87	.76	.84	.82	.84
Males	516	.85	.85	.76	.82	.78	.84
Am Indian/AK Native	55	.84	.85	.76	.79	.78	.86
Asian/Pacific Islander	36	.91	.87	.87	.88	.69	.80
Black	64	.84	.90	.86	.81	.80	.86
Hispanic	295	.81	.86	.69	.82	.81	.83
White	466	.85	.88	.75	.85	.80	.85

**Appendix K. Results of the Principal Components Analysis of the WARNS Social and Emotional Needs Items with a Truant Sample**

WARNS Social & Emotional Needs Items * Item reverse scored	Aggress. -Defiance	Depress. - Anxiety	Subst. Abuse	Peer Deviance	Family Environ.	School Engage.
7. Lost my temper and hit or yelled at someone	.67	.28	.06	.06	.12	.06
41. Got so angry hit or broke something	.65	.33	.14	.19	.06	.10
36. Picked on or bullied other kids	.63	-.05	.10	.11	.01	.07
24. Threatened to hurt someone	.61	.17	.23	.14	.01	.14
27. Lied, disobeyed, or talked back to adults	.59	.19	.22	.12	.23	.20
43. Lied, hustled, conned to get what I wanted	.55	.13	.38	.11	.06	.11
45. Damaged or stole something on purpose	.53	.08	.37	.16	.04	.13
2. Got into physical fights	.52	.01	.10	.32	.02	.08
14. Sad, down, or unhappy.	.10	.78	.04	.05	.11	.02
31. Tense, irritated, or worried	.13	.77	.09	.04	.08	.12
25. Trouble sleeping or eating	.06	.75	.13	.12	.15	.02
16. Hard to concentrate	.13	.73	-.01	.13	.06	.01
29. Hopeless about the future	.05	.68	.17	.02	.06	.18
37. Sick, had trouble breathing, or felt shaky	.12	.66	.10	.00	.02	.02
9. Nothing could cheer me up	.07	.65	.05	.09	.15	.07
39. Didn't care about anything or anyone	.33	.50	.20	.08	.11	.21
38. Missed school to use drugs/alcohol	.17	.05	.70	.07	-.03	.05
34. Used cocaine, meth, heroin, or pills	.09	.14	.69	.03	-.01	.05
22. Drank two or more alcoholic drinks in a day	.23	.08	.69	.22	.07	.03
15. Sick, passed out, or couldn't remember things	.14	.16	.67	.03	.04	.06
4. Smoked or used marijuana (pot, weed)	.27	.09	.66	.25	.14	.06
3. My friends got into trouble at school	.24	.08	.06	.76	.05	.16
35. My friends skipped or cut class.	.18	.15	.19	.72	.02	.13
47. My friends got into physical fights	.46	.10	.14	.62	-.01	.09
19. My friends could have been arrested	.25	.17	.37	.60	.10	.10
11. My friends got drunk or high	.14	.10	.54	.54	.12	.05
28. I could talk to my parents if I had a problem*	.12	.12	.03	.05	.78	.26
3. Felt close to my parents*	.15	.14	.03	.01	.77	.18
5. Parents would help with homework if I asked*	.00	.14	.06	.01	.71	.22
6. Parents' home a good place to do homework*	.03	.13	.04	.06	.68	.22
21. Got into arguments with my parents	.42	.28	.11	.11	.44	.01
44. My classes were interesting*	.10	.03	.00	.06	.08	.75
8. Felt supported and respected by adults at school*	.00	.10	.02	.15	.14	.70
42. My teachers cared about me*	-.10	.09	.05	.19	.18	.69
17. Learned things in class that will be important*	.02	.05	.12	-.03	.21	.64
1. Liked going to school*	.22	.06	.06	-.04	.04	.64
23. Studied for my quizzes and tests*	.21	-.05	.09	.03	.13	.63
13. I could talk to an adult at school if had problem*	-.06	.10	-.02	.19	.24	.62
32. Got my homework completed and turned in*	.26	.09	.00	.01	.00	.61
26. I thought about dropping out of school	.42	.24	.28	.06	.03	.36



Photo credits:

Rawpixelimages | Dreamstime.com - Diverse Group of High School Students with Arms Raised -  
<https://www.dreamstime.com/stock-photo-diverse-group-high-school-students-arms-raised-image44793457#res17303701>