

# The Journal

---

## OF AT-RISK ISSUES

National Dropout Prevention Center/Network  
College of Health, Education, and Human Development  
Clemson University, 209 Martin Street, Clemson, SC 29631-1555

[www.dropoutprevention.org](http://www.dropoutprevention.org)

Volume 15  
Number 2



*A Publication of the National Dropout Prevention Center/Network*







# The Journal OF AT-RISK ISSUES

## Editor

Rebecca A. Robles-Piña  
Sam Houston State University

## Associate Editor

Gregory Hickman  
Arizona State University

## Editorial Associate

Marty Duckenfield  
National Dropout Prevention  
Center/Network

## Editorial Assistants

Merry "Peg" Chrestman  
National Dropout Prevention  
Center/Network

Melissa Hawkins  
National Dropout Prevention  
Center/Network

## *The Journal of At-Risk Issues*

(ISSN1098-1608) is published bi-annually by the National Dropout Prevention Center/Network, College of Health, Education, and Human Development at Clemson University, 209 Martin Street, Clemson, SC 29631-1555, Telephone 864.656.2599, Fax 864.656.0136, [www.dropoutprevention.org](http://www.dropoutprevention.org)

## Editorial Responsibility

Opinions expressed in *The Journal of At-Risk Issues* do not necessarily reflect those of the National Dropout Prevention Center/Network or the Editors. Authors bear the responsibility for accuracy of content in their articles.

# The Journal of At-Risk Issues

## Editor

Rebecca A. Robles-Piña  
Sam Houston State University

## Associate Editor

Gregory Hickman  
Arizona State University

## Founding Editor

Ann Reitzammer  
Huntingdon College (Ret.)

## Gregory Benner

University of Washington

## Robert A. Cummins

Deakin University

## Patricia Cloud Duttweiler

San Antonio, Texas

## Sandy Harris

Lamar University

## Randy Heinrich

Argosy University

## Cynthia Loeffler

Sam Houston State University

## Paul Mooney

Louisiana State University

## Judy Nelson

Sam Houston State University

## Philip Nordness

Western Illinois University

## Corey Pierce

University of Northern Colorado

## Karen Smith

Sam Houston State University

## Sylvia Taubé

Sam Houston State University

## Alexandra Trout

University of Nebraska-Lincoln

## Brad Uhing

Wichita State University

## Patricia Van Velsor

San Francisco State University

## Dalun Zhang

Texas A&M University

## SPECIFICATIONS FOR MANUSCRIPT SUBMISSION

### Focus:

Manuscripts should be original works not previously published nor concurrently submitted for publication to other journals. Manuscripts should be written clearly and concisely for a diverse audience, especially educational professionals in K-12 and higher education. Topics appropriate for *The Journal of At-Risk Issues* include, but are not limited to, research and practice, dropout prevention strategies, school restructuring, social and cultural reform, family issues, tracking, youth in at-risk situations, literacy, school violence, alternative education, cooperative learning, learning styles, community involvement in education, and dropout recovery.

Research reports describe original studies that have applied applications. Group designs, single-subject designs, qualitative methods, mixed methods design, and other appropriate strategies are welcome. Review articles provide qualitative and/or quantitative syntheses of published and unpublished research and other information

that yields important perspectives about at-risk populations. Such articles should stress applied implications.

### Format:

Manuscripts should follow the guidelines of the *Publication Manual of the American Psychological Association* (6th ed.). Manuscripts should not exceed 25 typed, double-spaced, consecutively numbered pages, including all cited references. Submitted manuscripts which do not follow APA referencing will be returned to the author without editorial review. Illustrative materials, including charts, tables, figures, etc., should be clearly labeled with a minimum of 1 and 1/2 inch margins.

### Submission:

Submit electronically in Microsoft-Word, including an abstract, and send to the editor at [edu\\_rar@shsu.edu](mailto:edu_rar@shsu.edu) for editorial review. Manuscripts should also include a cover page with the following information: the full manuscript title; the author's full name, title,

department, institution or professional affiliation, return mailing address, email address, and telephone number; and the full names of coauthors with their titles, departments, institution or professional affiliations, mailing addresses, and email addresses. Do not include any identifying information in the text pages. All appropriate manuscripts will be submitted to a blind review by three reviewers. Manuscripts may be submitted at any time for review. If accepted, authors will be notified of publication. There is no publication fee.

### Book Reviews:

Authors are encouraged to submit appropriate book reviews for publication consideration. Please include the following: an objective review of no more than five, double-spaced pages; full name of the book and author(s); and publisher including city, state, date of publication, ISBN number, and cost.

### Submit Manuscripts to:

Dr. Rebecca A. Robles-Piña, Editor  
[edu\\_rar@shsu.edu](mailto:edu_rar@shsu.edu)





# Table of Contents

## Articles

- The Use of a Behavioral Parent Training Program for Parents of Adolescents  
*Annette K. Griffith* ..... 1
- Use of Explicit Instruction and Double-Dosing to Teach Ratios, Proportions, and Percentages to At-Risk Middle School Students  
*Lisa Piper, Nancy Marchand-Martella, and Ronald Martella*..... 9
- The Efficacy of the RENEW Model: Individualized School-to-Career Services for Youth At Risk of School Dropout  
*JoAnne M. Malloy, Vidyalakshmi Sundar, David Hagner, Leigh Pierias, and Tara Viet* ..... 19
- Predicting the Academic Functioning of Youth Involved in Residential Care  
*Annette K. Griffith, Alexandra L. Trout, Michael H. Epstein, Calvin P. Garbin, Robert Pick, and Tanya Wright* ..... 27







# The Use of a Behavioral Parent Training Program for Parents of Adolescents

Annette K. Griffith

**Abstract:** Adolescence can be a period of increased problem behavior, and parents often report this stage of development as being one of increased conflict with high levels of parenting-related stress and lower levels of confidence in parenting abilities. As a result, parents of adolescents seek out parenting information and support much more often than do parents of younger children. However, most parent training programs have been developed for parents of children aged 12 and under; very little is known about the use of parent training programs for parents of adolescents. Therefore, the purpose of this article was to examine the use of a behavioral parent training program for a population of parents with adolescent-aged youth to identify the characteristics of participants and examine pre-post changes. On average, both the parents and their youth had a high number of risk factors (e.g., substance abuse, domestic violence, clinical levels of problem behavior) when the program began. Significant changes were observed across both youth behavior and parent stress. Implications and directions for future research are discussed.

## Introduction

During adolescence, youth engage in higher levels of oppositional and defiant behavior as they seek to become more independent from their families (Schroeder & Gordon, 2002). While most youth typically outgrow these behaviors, for others they can become more severe and can persist over time. In the 2004-2005 school year, over 315,000 youth aged 12 to 17 were identified with an emotional or behavioral disorder (U.S. Department of Education, 2007). While this is a substantial number, it is suspected that many more youth engage in serious levels of problem behavior than are identified within the school system. It has been suggested that as many as 20% of youth engage in levels of problem behavior that are severe enough to warrant a psychiatric diagnosis (American Academy of Pediatrics, 2004; Gresham, 2005). In addition, Roberts, Roberts, and Xing (2007) reported that by the age of 16, 36.7% of U.S. youth could have qualified for at least one Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association [APA], 1994) diagnosis (e.g., conduct disorder, oppositional defiant disorder, attention deficit hyperactivity disorder, bipolar disorder) and 32.6% could have qualified for two diagnoses.

These high rates of problem behavior and mental health diagnoses are particularly concerning, especially for parents, as there is a significant positive correlation between engagement in problem behavior during adolescent and engagement in criminal or antisocial behavior as an adult. For instance, Copeland, Miller-Johnson, Keeler, Angold, and Costella (2007) reported that when youth were followed over time, those who had behavior prob-

lems (e.g., conduct disorder, oppositional defiant disorder, or attention-deficit hyperactivity disorder) between the ages of 9 and 16 were more likely to engage in criminal activities between the ages of 16 and 21. Specifically, they found that of those youth who displayed problem behavior during childhood and early adolescence, only 18.2% did not have any history of criminal involvement by the age of 21. They reported that 47% had engaged in serious or violent offences, 36.8% had engaged in moderate offences, and 21.9% had engaged in minor offenses. Although not all youth who display problem behavior will go on to display antisocial behavior in adulthood or have poor long-term outcomes (O'Reilly, 2005), the majority of adults who display such behaviors have a long history of doing so. For example, Hester, Beltodano, Gable, Tonelson, and Hendrickson (2003) reported that 74% of 21-year-old adults who had an emotional or behavioral disorder reported that they engaged in problem behavior as children or adolescents.

As adolescence can be a period of increased problem behavior, parents report this stage of development as being one of increased conflict with high levels of parenting-related stress (Tucker, McHale, & Crouter, 2003) and lower levels of confidence in parenting abilities (Becker, Hogue, & Liddle, 2002). As a result, parents of adolescents seek out parenting information and support much more often than do parents of younger children (Bogenschneider & Stone, 1997). In a recent survey on the behavior of adolescents, parents reported that adolescent problem behaviors were common and that they desired information on how to help their adolescents increase compliance, decrease conflict with parents and siblings, and manage their emotions (Ralph et al., 2003). While parents may often feel



that they have less of an impact on the behavior of their adolescents than they do the behavior of younger children, research has indicated that parents continue to influence the behavior of their youth as they make the transition into adolescence and adulthood (Berg-Neilsen, Viken, Dahl, 2003; Coombs, Paulson, & Richardson, 1991). Metzler, Biglan, Ary, and Li (1998) found that positive parenting practices such as monitoring, rule setting, and reinforcement for positive behaviors, were associated with lower levels of negative adolescent behaviors (e.g., antisocial behavior, substance abuse).

Because positive parenting behaviors can have an influence on adolescent behavior and can increase the likelihood that adolescents will engage in prosocial and adaptive behaviors, interventions aimed at influencing parent behavior may be an ideal way to address the needs of adolescent-aged youth who engage in or are at risk of engaging in problem behavior. Although there is variability in the way that interventions to alter parent behavior can be delivered (e.g., family therapy, in-home family services), parent training programs are one of the most commonly used interventions for families of children with and at risk for behavioral problems (Kazdin, 2005; Maughan, Christiansen, Jensen, Olympia, & Clarke, 2005). As a result, there have been a sizeable number of studies conducted on parent training programs. Maughan et al. (2005) reported that there have been over 400 data-based studies published on the topic. The effectiveness of parent training programs has been assessed in several reviews of the literature (Bunting, 2004; Lundahl, Risser, & Lovejoy, 2006; Maughan et al., 2005; Reyno & McGrath, 2006). Overall, the findings suggest that parent training is an effective intervention and has positive effects on a variety of outcomes for both parents and youth (e.g., parenting skills, parental stress and anxiety, youth behavior, parent-youth relationships; Assemany & McIntosh, 2002; Lundahl et al., 2006; Maughan et al., 2005; McCart, Priester, Davies, & Azen, 2006). The vast majority of these studies, however, have been conducted for families of young children, under the age of 12 (Maughan et al., 2005; McCart et al., 2006). As a result, the evidence base for the effectiveness of parent training interventions for adolescents is limited (Kazdin, 2005). Those studies that have examined the effectiveness of various parent training programs for parents of adolescent-aged youth have focused on the prevention of very specific problems (e.g., substance abuse, problems during the transition to high school) rather than addressing the needs of families of youth with already existing, broad types of problem behavior (Ralph & Sanders, 2003). Very little is known about the needs of parents of adolescents who participate in these programs, whether or not parent training interventions are useful for parents of adolescents who are already engaging in problem behavior, or the effects of parent training interventions for both parents (e.g., parent stress) and youth (e.g., youth behavior). Therefore, there is a need for additional research that can examine the use of parent training programs for families of adolescent-aged youth, particularly families of youth who may have high levels of risk or who are already engaging in high levels of problem behavior.

The purpose of the current study was to examine the use of a behavioral parent training program for a population of parents with adolescent-aged youth. Specifically, the study sought to: (a) examine the characteristics of the parents and youth who became involved with the program to identify the needs of families who seek out or are referred to the program, and (b) the changes that occurred for

parents and youth following parent participation in the program. Specifically, changes in parenting-related stress and youth externalizing behavior were examined.

## **Method**

### **Participants**

The Common Sense Parenting (CSP) program is advertised in the local community through flyers (sent to community agencies and doctors' offices) and newspaper advertisements. In addition to parents who sought out the program on their own, parents were also referred through child welfare, juvenile justice, local pediatric clinics, and local school districts. To participate, parents had to: (a) be aged 19 or over, (b) be present at the first class session of the CSP program, (c) have not previously participated in a CSP program, and (d) have an adolescent-aged youth between 12 and 16 years old. Forty-two parents met the criteria to participate and consented to be a part of the study.

### **Common Sense Parenting Program**

The CSP program is a behavioral parent training program for parents of children and youth aged 6 to 16. The program is based on operant learning principles (e.g., positive and negative reinforcement, positive and negative punishment, stimulus control; Kazdin, 2005) with training methods founded in Social Learning Theory (e.g., modeling, training in self-instruction; Bandura & Walters, 1963). It was designed to teach parents positive parenting techniques and behavior management strategies to help increase positive behaviors and decrease negative behaviors.

The program is taught in a series of six 2-hour sessions during which parents work with a parent facilitator in a group format of approximately 6 to 12 parents. The session topics include: (a) Parents as Teachers, (b) Encouraging Good Behavior, (c) Preventing Problems, (d) Correcting Problem Behavior, (e) Teaching Self-Control, and (f) Putting It All Together. For each of the sessions, parents use a parent manual (Burke, Schuchmann, & Barnes, 2006) that describes the CSP skills and provides parenting advice, scenarios, a CSP skill card that can act as a quick reference for parents, and a personal parenting plan workbook where the parents complete written activities and create their personal parenting plans. The CSP sessions center on five key training components: (a) review, (b) instruction, (c) modeling, (d) practice, (e) feedback, and (f) summary. In addition, between class sessions, parents are assigned readings from the program manual (Burke et al., 2006) and homework activities from the parenting plan workbook to become more familiar with and practice the use of the newly taught skills.

### **Measures**

#### ***Social History Questionnaire***

The Social History Questionnaire is a parent-report form designed specifically for this study to obtain information about a parent and his or her youth in regards to demographics and social history factors (e.g., education level, history of domestic violence). If a parent had more than one youth between the ages of 12 and 16, he or she was asked to select the one youth who presented the greatest level of problem behavior. The Social History Questionnaire was comprised



of 10 questions across four areas: (a) parent education and employment (e.g., level of education completed, type of employment); (b) parent history (e.g., history of domestic violence, substance abuse, mental illness); (c) youth history (e.g., history of physical abuse, psychiatric hospitalization, substance abuse); and (d) parent belief about the potential benefits of the CSP program in reducing levels of youth problem behavior.

### ***Child Behavior Checklist (Externalizing Scale)***

The Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) is a 120-item parent-report measure that was designed to assess the level of child problem behavior. Because the CSP program focuses primarily on child externalizing behavior, the CBCL Externalizing Scale was used for this study. The CBCL Externalizing Scale is comprised of 33 questions and covers both aggressive (e.g., gets in many fights, physically attacks people) and rule-breaking behavior (e.g., steals at home, uses drugs for nonmedical purposes). The items of the CBCL Externalizing Scale are scored on a 3-point Likert-type scale ranging from 0 (i.e., Not true) to 2 (i.e., Very true or often true). The psychometric properties of the CBCL have been well established. Specifically, the Externalizing Scale has adequate levels of content, construct, and convergent validity. Inter-rater, test re-test, and long-term reliability coefficients ranged from .66 to .90 (Achenbach & Rescorla, 2001).

### ***Parent Stress Index 3rd Edition—Short Form***

The PSI-SF (Abidin, 1995) was developed to assess an adult's level of stress in association with parenting. This parent-report measure was selected because previous research has shown significant improvements in levels of parent stress following parent participation in behavioral parent training programs (Ralph & Sanders, 2003). Two subscales of the PSI-SF were used for this study: (a) the Parental Distress Scale, and (b) the Parent-Child Dysfunctional Interaction Scale. These two subscales were selected because they measure constructs targeted by the CSP program; specifically, parent stress related to childrearing and parent interactions with their youth. Each of these subscales is comprised of 12 items that are rated using a 5-point Likert-type scale ranging from 1 (i.e., Strongly Disagree) to 5 (i.e., Strongly Agree). Research on the PSI-SF has shown adequate psychometric properties. Specifically, test-retest reliabilities ranged from .68 for the Parent-Child Dysfunction Scale to .85 for the Parent Distress Scale and convergent validity with the full version of the PSI ranged from .87 to .95 (Abidin, 1995).

### ***Data Collection***

Prior to the first CSP session parents were provided with an information packet that contained each of the three data collection forms to be completed (i.e., Social History Form, CBCL, PSI-SF). Parents completed the same information packet, with the exception of the Social History Form, immediately following the last CSP session. All of the measures were self-report and parents completed them independently. If any parents had difficulties with reading the items on the form, the items or entire forms were read aloud to those parents.

### ***Treatment Integrity***

To obtain information on adherence to the program content, two program sessions (Session One and Session Five) for each of the 14 classes were observed. Previous work on the development of the CSP treatment integrity forms indicated that the level of treatment integrity for both Session One and Session Five were highly, positively correlated with the overall level of treatment integrity for the entire program (Burke, 1995). Therefore, treatment integrity data were collected for these sessions only. When treatment integrity data were examined, it was found that overall mean scores ranged from 1.81 to 2.33 (on a scale from 1 to 3), with a mean score of 2.12 ( $SD = 0.13$ ). A score of 2.0 indicates adequate implementation (i.e., implementation of necessary components occurred, but not exactly as specified). Of the 14 classes for which treatment integrity data were collected, only two had scores below 2.0. These two classes were attended by 13.9% ( $n = 10$ ) of parents.

### ***Data Analysis***

Data from this study were analyzed in two phases. In the first phase, descriptive analyses (e.g., frequencies, means, standard deviations) were conducted to provide a summary of the characteristics of parents and children who participated in the CSP program. Second, analyses were conducted to examine changes that occurred from pretest to posttest. Paired t-test analyses were conducted to examine the statistical significance of pre-post changes that occurred in parents and children during the course of the study. Cohen's  $d$  effect sizes were also conducted to determine the magnitude of the changes. In addition, frequencies were obtained to identify changes in the numbers of parents or youth who were reported to have scores in the clinical level before and after the CSP program.

## ***Results***

### ***Descriptive Analyses***

In order to obtain information about the parents who participated in the CSP program and their youth, a series of descriptive analyses were conducted. Results for parents and youth are presented in Tables 1 and 2 respectively. Overall, both parents and youth had higher frequencies of risk than would be expected for the general population (National Institute on Drug Abuse [NIDA], 2008; National Institute for Mental Health [NIMH], 2008; Samuelson & Campbell, 2005). Although over one third of parents reported experiencing domestic violence, experience of risk was particularly high for the youth; almost half (42.9%) had experienced at least one psychiatric hospitalization and almost 10% had attempted suicide. In addition, parents reported clinical levels of stress related to parent-youth interactions and clinical levels of youth externalizing behavior (see Table 3).

Prior to beginning the CSP program, the majority of parents (69%) had expectations that the program would be beneficial in helping them to reduce levels of youth problem behavior. Only 19% of parents did not agree that it would be helpful. During the course of the CSP program, parents attended the majority of the class sessions. The number of classes attended ranged from four to six (the program is comprised of six class sessions), with a mean of 5.46 ( $SD = 0.61$ ).



Table 1

*Parent Demographics and Social History Information*

	Frequency	Percent
Gender		
Female	24	57.1 %
Male	11	26.2 %
Unknown	7	16.7 %
Education Level		
No High School	1	2.4 %
Some High School	1	2.4 %
High School Graduate	12	28.6 %
Some College	18	42.9 %
College Graduate	10	23.8 %
Socioeconomic Level (Hollingshead Index)		
Lower	4	9.5 %
Lower/Middle	7	16.7 %
Middle	23	54.8 %
Upper/Middle	4	9.5 %
Upper	0	
Unknown	4	9.5 %
Experienced Risks		
Domestic Violence	15	35.7 %
Mental Illness	7	16.7 %
Conviction of a Crime	7	16.7 %
Substance Abuse	5	11.9 %
Psychiatric Hospitalization	4	9.5 %

Table 2

*Youth Demographics and Social History Information*

	Frequency	Percent
Age		
12	3	7.1 %
13	3	7.1 %
14	9	21.4 %
15	16	38.1 %
16	11	26.2 %
Gender	15	35.7 %
Female	27	64.3 %
Male		
Ethnicity	32	76.2 %
Caucasian	3	7.1 %
African American	1	2.4 %
Hispanic	6	14.3 %
Other		
Experienced Risks	18	42.9 %
Psychiatric Hospitalization	7	16.7 %
Substance Abuse	7	16.7 %
Identification for Special Education	6	14.3 %
Physical Abuse	4	9.5 %
Attempted Suicide		

Table 3

*Changes From Pretest to Posttest*

Measure	N	Pretest Mean (SD)	Posttest Mean (SD)	t-value	Degrees of Freedom	p-value	ES (d)
CBCL Rulebreaking	41	66.17 (8.62)	60.90 (7.09)	4.01	40	< .001	.67
CBCL Aggressive	41	68.83 (9.92)	62.56 (7.59)	3.69	40	.001	.71
CBCL Externalizing	41	68.00 (7.80)	62.02 (7.02)	4.47	40	< .001	.81
PSI-SF Parent Distress	42	27.43 (6.37)	24.02 (7.05)	3.80	41	< .001	.51
PSI-SF Parent Child Dysfunctional Interaction	42	31.76 (8.06)	26.88 (8.53)	4.16	41	< .001	.59



Changes From Pretest to Posttest

In order to examine the changes from pretest to posttest, paired t-test analyses were conducted. Results are presented in Table 3. For each of the measures, there were significant differences from pretest to posttest in the anticipated directions. Specifically, there was a significant decrease from pretest to posttest for the two subscales of the PSI-SF and for the CBCL. With the exception of the Parent Distress subscale of the PSI-SF, pretest scores were in the clinical range. Posttest scores for the CBCL subscales dropped to the borderline range and the Parent Child Dysfunctional Interaction subscale of the PSI-SF dropped to just above the clinical cutoff score of 26. Based on standards put forth by Cohen (1988), the effect sizes were all medium (.50 to .80) to large (over .80).

Although the t-test analyses indicated that changes across each measure were statistically significant, frequencies were also obtained to examine changes in the distributions of scores. Specifically, frequencies were obtained to determine the percentages of parents who had scores that reduced from the clinical to normal ranges of the PSI-SF and the percentages of youth who had scores that reduced from the clinical to borderline to normal ranges of the CBCL. These findings are presented in Table 4. Across all subscales of all measures, there were greater percentages of both parents and youth with scores in the normal level at posttest than there had been at pretest.

Discussion

This study was conducted to address the need for research on the use of parent training programs for parents of adolescent-aged youth. The specific purpose of this study was to conduct an evaluation of the CSP program to determine: (a) the characteristics of the parents and youth who became involved to identify the needs of families who seek out or are referred to the program and (b) the changes that occurred after parent participation in the program.

Descriptive Analyses

Examination of the demographics and social history of the parents and youth who were involved in the program indicated that, at the time the program began, many families had higher levels of risk than would be expected in the general population. For example, 35 % of parents reported experiencing domestic violence, compared to 8 % to 12 % of the general population; 12 % had experienced substance abuse, compared to 8.2 % of the general population; and 9.5 % of youth had attempted suicide, compared to 6.9 % nationally (NIMH, 2008). The presence of these risk factors in addition to clinical levels of parental stress and child problem behavior indicate that these families likely had a high level of need for intervention. As such, the CSP program really was serving as an intervention program opposed to one of prevention. Although the CSP program was originally intended to be a prevention program, it has evolved over time to address the needs of parents who seek an intervention program by including information on how to deal with youth who may be demonstrating out of control behavior (e.g., temper tantrums) and discussions about how to involve school personnel and how to seek additional family supports (e.g., accessing mental health agencies). The addition of these services was due to previous research findings that the families who sought out the program often had a need to deal with high levels of already occurring problem behavior (Friman, Soper, & Thompson, 1993). This was true for all age levels, but was particularly true for parents of older youth who engaged in higher levels of problem behavior (Ruma, Burke, & Thompson, 1996). While it is likely that there are families who would benefit from preventive programs such as those aimed to reduce substance abuse or prevent problems during the transition to high school, the current findings suggest that there is also a need for intervention programs that are aimed at parents who have youth already engaging in high levels of externalizing problem behavior. This is consistent with the findings of Ralph and Sanders (2003) who reported that parents of adolescents want information on how to deal with already existing behavior problems (e.g., conflict within the family, dealing with emotions).

Table 4  
*Changes in Distributions of Scores From Pretest to Posttest*

	Percentage With Normal Scores		Percentage With Borderline Scores		Percentage With Clinical Scores	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
CBCL						
Rulebreaking	23.8	36.6	14.3	24.4	61.9	39.0
Aggressive	16.7	39.0	4.8	17.1	78.6	43.9
Externalizing	19.0	39.0	9.5	17.1	71.4	43.9
PSI						
Parental Distress	85.7	90.5			14.3	9.5
Parent Child Dysfunctional Interaction	14.3	42.9			85.7	57.1



## Changes From Pretest to Posttest

Across all measures there were significant improvements, with large-sized effects. This is consistent with findings from previous studies of the CSP program conducted with parents of youth aged 6 to 16 (Thompson, Grow, Ruma, Daly, & Burke, 1993). These findings are promising, as they suggest that behavioral parent training programs may be helpful for high-risk families whose adolescent-aged youth exhibit clinical levels of problem behavior. Although changes on the CBCL Externalizing scale indicated that, on average, scores were reduced only to the borderline range ( $M = 62.02$ ,  $SD = 7.02$ ), the percentage of parents who reported their youth in the normal range increased by 20% and the percentage that reported their youth in the clinical range decreased by almost 30%. Findings were similar for the Parent-Child Dysfunctional Interaction subscale of the PSI-SF. For a 6-week program that did not specifically target families of adolescents with such high levels of risk (e.g., psychiatric hospitalizations, substance abuse, suicidality, clinical levels of problem behavior), these results are impressive.

Although these findings suggest that the program may be effective for reducing levels of parent stress and decreasing rates of youth externalizing behavior, because the study used a pre/post design and did not include comparison groups, this cannot be definitively determined. Several factors, other than the CSP program, may have been responsible for the observed changes. Factors such as regression to the mean or confounding variables (e.g., interactions with the facilitator and other parents, time out of the home, expectations about the CSP program) may have contributed to outcomes either wholly or in part. For example, previous studies found that a large number of mothers who participated in parent training programs had few informal supports such as family or friends (Dumas, 1984; Webster-Stratton, 1990) and that parent training programs offered in groups had the benefit of a "support group"-like atmosphere that allowed for socialization with other parents also experiencing difficulty with child behavior (Dumas, 1984; Dumas & Wahler, 1983). Although social insularity was not a variable measured in the present study, parents were informally observed to form friendships with one another during the course of the program. Therefore, it is possible that the changes on outcome measures were the result of a socialization aspect of the program, or other confounding variables, rather than the specific CSP content. In order to evaluate the effects of the program content controlling for other factors such as socialization, future studies need to be conducted that use more rigorous research designs (e.g., waitlist control, randomized clinical trial).

## Limitations

In addition to a lack of a control group, there are several limitations of this study that should be noted. First, the participants in the study were all residents of one medium-sized city in the Midwest. As such, the parents and youth involved in the current study may differ on important characteristics from those in other areas of the United States (e.g., there was limited representation of various racial/ethnic groups with over 75% of children being Caucasian). These differences may affect the generalizability of the current results to parents and youth in other geographic areas. As such, additional research is needed on more diverse and nationally representative samples.

Second, all of the measures used in the present study were parent self-report measures. Although Baydar, Reid, and Webster-Stratton (2003) found that self-report measures of parenting practices and child behavior were highly correlated with staff observations, the validity of self-report measures have been questioned in many other studies (Wickstrom, Jones, & LaFleur, 1998). In research on parenting and parent training programs, it has been found that parents who have high levels of stress or depression may overestimate their children's levels of problem behavior (Dumas & Wahler, 1983). As such, findings obtained using self-report measures should be viewed with caution. Additional research is needed that uses other forms of data collection, such as observation.

Finally, the findings of the current study are based upon the 42 parents who met all of the requirements for participation and who completed the data collection process. Although previous research did not identify any demographic differences between parent training program completers versus noncompleters (Werba, Eyberg, Boggs, & Algina, 2006), it is not possible to determine how parents who chose to participate may have differed from those who did not. Future studies would benefit from attempting to determine reasons why parents do not choose to participate in studies and why they may not complete parent training programs and what outcomes are like for these families.

## Future Research

In addition to examining the effects of behavioral parent training programs for parents of adolescents using more rigorous research designs, future research needs to be conducted to identify subgroups that may exist (e.g., families who need prevention versus intervention, families with different types of risk). Effects of parent training programs need to be examined for these different groups, and the specific variables that may serve to predict their outcomes need to be identified. In addition, there needs to be an increased emphasis on the examination of process factors (e.g., treatment integrity, dosage, parent engagement, measurement approaches) and how these factors are related to outcomes. Process factors need to be examined to determine how they relate to other variables that have been found to predict outcomes. Finally, a systematic line of research needs to be conducted to determine if behavioral parent training programs are effective for adolescent-aged youth with high levels of risk. This will require that studies be conducted (a) using rigorous experimental designs that include control groups, (b) using follow-ups to determine if effects maintain over the course of at least one year, and (c) by researchers at multiple sites.

## Conclusions

Adolescents who engage in problem behavior are at an increased risk to engage in antisocial and criminal activities as adults. The current study suggests that parents of adolescent-aged youth have a need and a desire to obtain information on how to deal with problem behavior. Although the current study cannot definitively determine if behavioral parent training programs are effective in reducing rates of adolescent problem behavior, results are promising and future research is warranted.



## References

- Abidin, R. R. (1995). *Parenting Stress Index* (3rd ed.). Odessa, FL: Psychological Assessment Resources, Inc.
- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for ASEBA school-age forms and profiles*. Burlington: University of Vermont, Research Center for Children, Youth, & Families.
- American Academy of Pediatrics. (2004). Policy statement, school-based mental health services. *Pediatrics*, 113, 1839-1845.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Assemany, A. E., & McIntosh, D. E. (2002). Negative treatment outcomes of behavioral parent training programs. *Psychology in the Schools*, 39, 209-219.
- Bandura, A., & Walters, R. H. (1963). *Social learning and personality development*. New York: Holt Rinehart and Winston.
- Baydar, N., Reid, M. J., & Webster-Stratton, C. (2003). The role of mental health factors and program engagement in the effectiveness of a preventive parenting program for Head Start mothers. *Child Development*, 74, 1433-1453.
- Becker, D., Hogue, A., & Liddle, H. A. (2002). Methods of engagement in family-based preventive intervention. *Child and Adolescent Social Work Journal*, 19, 163-179.
- Berg-Neilsen, T. S., Viken, A., & Dahl, A. A. (2003). Specific parenting problems when adolescents have emotional and behavioral disorders. *Nordic Journal of Psychiatry*, 57, 139-146.
- Bogenschneider, K., & Stone, M. (1997). Delivering parent education to low and high risk parents of adolescents via age-paced newsletters. *Family Relations*, 46, 123-134.
- Bunting, L. (2004). Parenting programmes: The best available evidence. *Child Care in Practice*, 10, 327-343.
- Burke, R. V. (1995). *Effects of treatment integrity and risk for child abuse on parent training outcomes* (Unpublished doctoral dissertation). University of Nebraska, Lincoln.
- Burke, R., Schuchmann, L. F., & Barnes, B. (2006). *Common sense parenting: Trainer's guide* (3rd ed.). Boys Town, NE: Girls and Boys Town National Resource and Training Center.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.
- Coombs, R. H., Paulson, M. J., & Richardson, M. A. (1991). Peer vs. parental influence in substance use among Hispanic and Anglo children and adolescents. *Journal of Youth and Adolescents*, 20, 73-88.
- Copeland, W. E., Miller-Johnson, S., Keeler, G., Angold, A., & Costella, E. J. (2007). Childhood psychiatric disorders and young adult crime: A prospective, population-based study. *American Journal of Psychiatry*, 164, 1668-1675.
- Dumas, J. E. (1984). Child, adult-interactional, and socioeconomic setting events as predictors of parent training outcome. *Education and Treatment of Children*, 7, 351-364.
- Dumas, J. E., & Wahler, R. G. (1983). Predictors of treatment outcomes in parent training: Mother insularity and socioeconomic disadvantage. *Behavioral Assessment*, 5, 301-313.
- Friman, P. C., Soper, S. H., & Thompson, R. W. (1993). Do children from community-based parent training programs have clinically significant behavior problems? *Journal of Community Psychology*, 21, 56-63.
- Gresham, F. M. (2005). Response to intervention: An alternative means of identifying students as emotionally disturbed. *Education and Treatment of Children*, 28, 328-344.
- Hester, P. P., Beltodano, H. M., Gable, R. A., Tonelson, S. W., & Hendrickson, J. M. (2003). Early intervention with children at risk of emotional/behavioral disorders: A critical examination of research methodology and practices. *Education & Treatment of Children*, 26, 362-381.
- Kazdin, A. E. (2005). *Parent management training*. New York: Oxford University Press.
- Lundahl, B., Risser, H. J., & Lovejoy, M. C. (2006). A meta-analysis of parent training: Moderators and follow-up effects. *Clinical Psychology Review*, 26, 86-104.
- Maughan, D. R., Christiansen, E., Jenson, W. R., Olympia, D., & Clarke, E. (2005). Behavioral parent training as a treatment for externalizing behavior and disruptive behavior disorders: A meta-analysis. *School Psychology Review*, 34, 267-286.
- McCart, M., Priester, P., Davies, W., & Azen, R. (2006). Differential effectiveness of behavioral parent-training and cognitive-behavioral therapy for antisocial youth: A meta-analysis. *Journal of Abnormal Child Psychology*, 34, 527-543.
- Metzler, C. W., Biglan, A., Ary, D. V., & Li, F. (1998). The stability and validity of early adolescents' reports of parenting constructs. *Journal of Family Psychology*, 12, 600-619.
- National Institute on Drug Abuse. (2008). NIDA InfoFacts: High school and youth trends. Retrieved April 28, 2009, from <http://www.drugabuse.gov/Infofacts/HSYouthtrends.html>
- National Institute for Mental Health. (2008). *The numbers that count: Mental Disorders in America*. Retrieved April 23, 2009, from <http://www.nimh.nih.gov/health/publications/statistics-listing.shtml>
- O'Reilly, D. (2005). *Conduct disorder and behavioral parent training*. Philadelphia: Jessica Kingsley.
- Ralph, A., & Sanders, M. R. (2003). Preliminary evaluation of the Group Teen Triple P program for parents of teenagers making the transition to high school. *Australian e-Journal for Advancement of Mental Health (AeJAMH)*, 2.
- Ralph, A., Toumbourou, J. W., Grigg, M., Mulcahy, R., Carr-Gregg, M., & Sanders, M. R. (2003). Early intervention to help parents manage behavioural and emotional problems in early adolescence: What parents want. *Australian e-Journal for Advancement of Mental Health (AeJAMH)*, 2.
- Reyno, S., & McGrath, P. (2006). Predictors of parent training efficacy for child externalizing behavior problems: A meta-analytic review. *Journal of Child Psychology and Psychiatry*, 47, 99-111.
- Roberts, R. E., Roberts, C. R., & Xing, Y. (2007). Rates of DSM-IV psychiatric disorders among adolescents in a large metropolitan area. *Journal of Psychiatric Research*, 41, 959-967.
- Ruma, P. R., Burke, R. V., & Thompson, R. W. (1996). Group parent training: Is it effective for children of all ages? *Behavior Therapy*, 27, 159-169.

- Samuelson, S. L., & Campbell, C. D. (2005). Screening for domestic violence: Recommendations based on a practice survey. *Research and Practice, 36*, 276-282.
- Schroeder, C. S., & Gordon, B. N. (2002). *Assessment and treatment of childhood problems: A clinician's guide* (2nd ed.). New York: The Guilford Press.
- Thompson, R. W., Grow, C. R., Ruma, P. R., Daly, D. L., & Burke, R. V. (1993). Evaluation of a practical parenting program with middle- and low-income families. *Family Relations, 42*, 21-25.
- Tucker, C. J., McHale, S. M., & Crouter, A. C. (2003). Conflict resolution: Links with adolescents' family relationships and individual well-being. *Journal of Family Issues, 24*, 715-736.
- U.S. Department of Education. (2007). *Twenty-ninth annual report to Congress on the implementation of the Individuals with Disabilities Education Act*. Washington, DC: Author.
- Webster-Stratton, C. (1990). Predictors of treatment outcome in parent training for families with conduct-problem children. *Journal of Abnormal Child Psychology, 18*, 479-492.
- Werba, B. E., Eyberg, S. M., Boggs, S. R., & Algina, J. (2006). Predicting outcome in parent-child interaction therapy: Success and attrition. *Behavior Modification, 30*, 618-646.
- Wickstrom, K. F., Jones, K. M., & LaFleur, L. H. (1998). An analysis of treatment integrity in school-based behavioral consultation. *School Psychology Quarterly, 13*, 141-154.

---

## Author

**Annette K. Griffith**, Ph.D., is an Assistant Research Professor at the Center for At-Risk Children's Services at the University of Nebraska-Lincoln. She is interested in understanding more about youth who are involved in out-of-home care and in examining interventions to help improve their outcomes.

---



# Use of Explicit Instruction and Double-Dosing to Teach Ratios, Proportions, and Percentages to At-Risk Middle School Students

Lisa Piper, Nancy Marchand-Martella, and Ronald Martella

**Abstract:** *The purpose of this action research was to determine the level of improvement of middle school students who were low performers in a mathematics class ( $N = 8$ ) and who received "explicit instruction" with "double dosing" compared to their peer group who received normal instruction ( $N = 49$ ). Results showed that at-risk participants: (a) demonstrated large increases in noncalculator and calculator performance, (b) performed near their peer group on the posttest assessments, and (c) performed at or near their peer group across the four quizzes. Implications for future research are discussed.*

## Introduction

Mathematics and other technical skills play an important role in our everyday lives. In 1970, only 9% of all U.S. jobs were considered technical; today, technical jobs make up nearly one-third of all employment opportunities (PBS Parents, 2003). Accordingly, the National Mathematics Advisory Panel (2008) recommended that, "national policy must ensure the healthy development of a domestic technical workforce with adequate scale and top-level skill" (p. 3). As the world's reliance on technology has grown, so too has the demand for people who have solid skills in mathematics and science. Kilpatrick, Swafford, and Findell (2001) noted that mathematics has had an important impact on science, technology, engineering, business, and government. Therefore, in order for individuals to participate more fully in society, they must know basic mathematics.

Unfortunately, mathematics achievement in the U.S. lags behind that of other countries. Over the past decade, a number of international measurements and analyses of student academic performance (e.g., Trends in International Mathematics Study or TIMSS) has shown the U.S. as having relatively unimpressive results compared to other countries (Gonzales et al., 2004). Lemke et al. (2004) noted that in mathematics literacy (i.e., judgments about space and shape, change and relationships, quantity, and mathematical uncertainties) and problem solving (i.e., applying basic mathematical skills to authentic situations), the U.S. ranked 24th out of 29 nations. Further, Baker, Gersten, and Lee (2002) reported that more than 90% of 17-year-olds struggle with multistep math problems and algebra; students who do not take algebra or geometry are far less likely to go to college than their peers who do take these courses (36% versus 83%).

Further, statistics highlight the difficulties students experience in math. The 2007 National Assessment of Educational Progress (Lee, Grigg, & Dion, 2007) showed dismal results with only 32% of math scores for eighth graders at or above the proficient level. The proficient level was defined as having "a thorough understanding of basic-level arithmetic operations and understanding sufficient for problem solving in practical situations" (p. 36). Even the top-ranked state of Massachusetts resulted in only 51% of students who tested at or above the proficient level, leaving nearly half of all students tested performing at or below basic levels of math competency. Additionally, Ginsburg, Cooke, Leinwand, Noell, and Pollock (2005) reexamined data from three international surveys assessing mathematics achievement. Countries that scored well on items requiring knowledge of facts and procedures (a lower-level skill) also scored well on items emphasizing mathematical reasoning (a higher-level skill); these results suggest that basic skills are essential prerequisites to more complex mathematical tasks. Compared to other countries, U.S. students do not do well on questions at either skill level.

In response to the low mathematics achievement evidenced by U.S. students, the Fordham Foundation released a report (Klein et al., 2005) that conducted an analysis of state standards to determine their efficacy. Several areas of concern were noted after examining standards across all 50 states: (a) overemphasis of calculators; (b) limited memorization of basic math facts; (c) lack of teaching standard algorithms; (d) insufficient instruction on fractions; (e) overemphasis of patterns, manipulatives, and estimation; and (f) lack of a gradual increase in problem solving. Interestingly, the National Council of Teachers of Mathematics (NCTM; 2006) published curriculum focal points that highlight important concepts, algorithms, and

basic skills that should be emphasized at increasing levels of education. The NCTM curriculum focal points recommended mathematics instruction that is fast paced, includes teacher modeling with many teacher-directed, product-type of questions, and transitions from demonstration to error-free student responding. Given the concerns raised by Klein et al. and the recent NCTM curriculum focal points, it appears that a focus should be placed on instruction that is more explicit in nature.

Explicit instruction is defined as clear, accurate, and unambiguous instruction (Stein, Kinder, Silbert, & Carnine, 2006). Tasks are broken down into small steps. The teacher models a specific skill, practices the skill with the students, providing feedback when needed, and allows time for students to practice the skill independently. Error correction procedures are conducted immediately and correct responses are praised. Guessing is kept to a minimum because students are shown specific methods to solve particular types of problems (e.g., students shown how to convert a decimal to a fraction by saying the decimal correctly, writing it as a fraction, and then simplifying the fraction using factors common to the numerator and denominator). Consequently, explicit instruction works well for basic skill development (NCTM, 2007a). It requires skill mastery before advancing to more difficult skills.

In contrast, the constructivist approach is largely student centered and focuses on inquiry-based activities where students approach a problem and create their own way to solve it. They then share different ways to approach the problem. Many tasks are open-ended and may have several different answers or one answer with many different approaches. Unfortunately, for students at risk for school failure, this approach may prove problematic (Kroesbergen, Van Luit, & Maas, 2004). Kroesbergen et al. compared constructivist instruction (CI) to explicit instruction (EI) and found that low-achieving students (ages 8 to 11) benefited more from instruction that involved explicit teaching of strategies and how and when to apply them. It was originally hypothesized that students in EI condition would show more favorable results in automaticity of basic multiplication facts, and that students in the CI condition would have a more favorable showing of results in the area of problem solving. Their findings were surprising to them. There was no significant difference in automaticity of multiplication facts, and in problem solving, the students in the EI condition outperformed students in the CI condition. They attributed that constructivist instruction resulted in lower scores as compared to explicit instruction because low-achieving students experienced both correct and incorrect solutions leading to increased confusion.

The NCTM (2000) reported the importance of the *equity principle*—namely that all students should be enrolled in a rigorous mathematics curriculum. To achieve this end, Bottoms and Carpenter (2003) found that extra help for struggling students was more effective in advancing achievement when provided by the regular classroom teacher as compared to remedial math placement. With extra assistance and modifications to a challenging mathematics curriculum, students at risk for school failure may achieve mastery of the basic skills necessary to participate in everyday activities that involve higher-order thinking skills (Kilpatrick et al., 2001; Woodward & Brown, 2006). Kilpatrick et al. stressed the importance of procedural fluency or working problems with ease, noting that in its absence, students

will have trouble solving more complex mathematical problems. Further, the NCTM (2007b) noted that development of skill efficiency was promoted in classrooms that included teacher-led, whole-class instruction, a task-focused environment, and faster-paced lessons with time devoted to seatwork.

Baker et al. (2002) conducted a meta-analysis to determine the efficacy of intervention strategies for students at risk for math failure. Fifteen studies were examined spanning the years 1971 to 1999. Results showed that four interventions led to significant improvements in the mathematical skills of at-risk students. First, curriculum-based measures were effective in monitoring student progress, providing teachers with the necessary data to pinpoint specific student needs (effect size = 0.57). Second, peer tutoring was found to improve math achievement, particularly in the area of computation (effect size = 0.62). Third, supplying parents with feedback of their children's progress was found to be effective (effect size = 0.42). Finally, explicit instruction proved beneficial for low-achieving students (effect size = 0.58). The NCTM (2007a) echoed the importance of explicit instruction in their research brief highlighting effective strategies for teaching students who experienced math difficulties. The Baker et al. study was cited in this brief noting the importance of explicit instruction. Unfortunately, no studies were found on the use of explicit instruction to teach ratios, proportions, and percentages to middle school students at risk for school failure.

In addition to using explicit instruction to improve the skills of students at risk for failure, double dosing has been found to be an effective intervention. Double dosing involves the provision of additional time to acquire mathematics skills that were not achieved during the regular class period; it gives students the opportunity to hear concepts again allowing for increased academic learning time (Maxwell, 2006). Increasing instructional time has been found to be one of the most important correlates to academic learning. Anderson and Walberg (1993) noted that, "time is a central and irreducible ingredient among the alterable factors in learning" (p. 6). Double dosing offers this additional time. Bottoms and Carpenter (2003) suggested that schools should require students earning less than a B to attend extra help sessions at least twice a week, preferably offered by their regular classroom teacher. Maxwell described the importance of a second period or "double-dose" of the same subject for students at risk for failure. Double dosing in the form of extra periods or Saturday classes may be just the ingredient to academic success for struggling students. Unfortunately, no studies were found on the use of double dosing to improve skills in solving problems involving ratios, proportions, and percentages on middle school students at risk for school failure.

The purpose of this action research was to assess the effects of explicit instruction coupled with double dosing in ratios, proportions, and percentages on the mathematics skills of middle school students at risk for school failure.

## Method

### Participants

Two sets of participants were involved in this action research. The first set involved an at-risk group and the second involved a peer group.



**At-risk participants.** This at-risk group included 8 participants. There were 6 females and 2 males. All participants were Caucasian with an average age at the onset of the action research of 13 years and 2 months (range = 12 years 9 months to 13 years and 6 months).

Participants were selected for participation in this action research because they did not meet the minimum mathematics standard on the sixth-grade Washington Assessment of Student Learning (WASL). Meeting standard on the WASL was defined as earning a minimum score of 400. The WASL is divided into four levels. Level one is well below standard with scores ranging from 275-374. Level two is defined as below standard with scores ranging from 375-399. Level three is defined as meeting standard with scores ranging from 400-424. Level four is noted as exceeding standard with scores ranging from 425-550. At the middle school in this action research, 63.5% of the seventh graders at the middle school met or exceeded the seventh grade math standard; the state average was 48.5%. The participants in this action research scored between 359-391 (levels one and two) with 3 students scoring well below standard (level one) and the remaining 5 participants scoring below standard (level two).

These participants also scored at or below 40% on the district mandated mathematics diagnostic test given to all middle school students at the beginning of the school year (average score for participants selected for this action research = 29.5%; range = 22%-38%). They also earned scores below 70% correct (D or F) on mathematics assessments administered during the fall quarter of their seventh-grade academic school year (average score = 62%; range = 55%-68%). Six of the eight students were enrolled in one or more support classes because they were reading one or more years below grade level. These support classes included reading strategies, remedial science, remedial social studies, and remedial English. Additional risk factors included one student formerly identified to receive special education services, one student who received multiple discipline referrals (35 demerits; students with more than 10 demerits are defined as behaviorally at risk and are placed on a behavior contract by the school). The students in the at-risk group did not meet qualifications to be placed in an honors mathematics class and were not recommended for placement in a remedial class. No students in this group were identified for special education.

**Peer group.** The peer group involved those 49 students who were performing at grade level in mathematics. These students were part of an academic team. This academic team shared students among the four core academic subjects—math, science, English, and social studies. The students in the peer group did not meet qualifications to be placed in an honors mathematics class and were not recommended for placement in a remedial class. No students in this group were identified for special education.

The teacher (first author) conducted this action research in her classroom. The purpose of action research is to “solve a practical problem in an authentic setting” (Nolen & Vander Putten, 2007, p. 406). Action research can involve a teacher helping a researcher design and conduct a study (Martella, Nelson, & Marchand-Martella, 1999) as was done in this investigation. The teacher was the only math instructor for all students in both the at-risk group and peer group. Students in both groups were mixed within two periods of seventh-grade math.

## Setting

This action research took place in a middle school located in the suburbs of a mid-sized city in the Pacific Northwest. It was comprised of seventh- and eighth-grade students, with an enrollment of 817 students (434 seventh graders and 383 eighth graders). Approximately 18% of the students qualified for free or reduced price lunch. Diversity at the school included 8% of students from culturally diverse backgrounds (American Indian or Alaskan Native, 0.5%; Asian or Pacific Islander, 3%; Black, 1.6%; and Hispanic, 1.8%).

There were three core academic teams at the seventh- and eighth-grade levels. Teams were comprised of four core academic teachers for math, science, social studies, and English. Elective and health-and-fitness teachers were not assigned to a specific team. Each academic team was assigned approximately one-third of the students at each grade level. Each of those students had the same math, science, social studies and English teacher. The middle school offered math classes for students with Individualized Education Programs, remedial math classes (two classes of 18 students), classes for students performing at grade level, and honors math classes (single and double acceleration).

The teacher in this action research was an author. She conducted this action research as part of her requirements for a master's degree in interdisciplinary studies with focus on mathematics and special education. She earned a bachelor's degree in education with a major in mathematics and hold a K-8 endorsement. She has 10 years of experience teaching middle school mathematics with four years of experience providing remedial mathematics instruction. The district trained her in the use of the district-approved mathematics program. She has also participated in two 1-week summer institutes offered by her employing school district. The institutes sought to align curriculum with the Washington State Grade Level Expectations (GLE) across grades K-12 within the district.

## Curriculum

**Connected Math Project (CMP).** CMP (Lapan, Fey, Fitzgerald, Friel, & Phillips, 2004) was the district-approved middle school mathematics program. The program is an inquiry-based mathematics program that is taught to sixth- and seventh-grade students. One seventh-grade unit of CMP was used in this action research project—Comparing and Scaling. The Comparing and Scaling unit contained very little basic skill instruction or review; thus, basic skills worksheets and lessons were developed to supplement the CMP unit. Once the basic skills lessons were taught, students then participated in the inquiry-based lessons found within the Comparing and Scaling unit. This unit included: (a) conversion of fractions, decimals, and percents; (b) proportions from word problems; (c) unit rates from word problems; (d) comparison of ratios using inequalities and equal symbols; (e) solving for missing numbers in proportions; (f) finding missing numbers in percent sentences; and (f) calculation of tax and discounts.

**Conversion of fractions, decimals, and percents.** Lessons on this topic included calculator use as well as a requirement to memorize conversions for frequently used fractions with denominators such as 2, 3, 4, 5, 8, and 10. Students were taught to convert between fractions and decimals followed by conversion between decimals and percents. To convert between fractions and percents, students would convert to a decimal as an intermediate step. An example problem

might include the following: “Convert  $\frac{5}{8}$  to a decimal and a percent. Do not round. Describe the process that you used.”

*Proportions from word problems.* Students were taught to read problems twice and place the information into a proportion using a variable for the missing number. Cross products were then used to solve the problem. An example problem might include the following: “Gavin traveled 354 miles on 12 gallons of gas. How many miles did Gavin travel using 20 gallons of gas?”

*Unit rates from word problems.* The same format that was used to solve unit rates was used to solve non-unit-rate proportions, but attention was focused on converting unit rates into fraction form to complete a proportion. Students could solve a problem such as the following: “If 4 pounds of watermelon cost \$2.16. What is the cost per pound?”

*Comparison of ratios using inequalities and equal symbols.* Three methods of comparison were taught. These included comparison of two ratios by conversion to a decimal, comparison of cross-products, and use of common denominators. Students used the method of their choice after showing mastery (80% correct) for each method. An example problem might read: “Place a symbol for less than ( $<$ ), greater than ( $>$ ) or equal to ( $=$ ) between the two given ratios using the method indicated.”

*Solving for Missing Numbers in Proportions.* Three out of four numbers were placed in a direct proportion with a variable in place of the missing number. Students were taught to use the product of the extremes set equal to the product of the means (cross products). A sample problem might include “ $\frac{3}{4} = \frac{c}{8}$ . Use cross products to solve for  $c$ .”

*Finding a missing number in percent sentences.* A percent sentence was given in words and students were asked to place the numbers and one variable into a percent proportion. Students used cross products to solve for the missing number. An example problem could be written as follows: “What is 6% of 200?”

*Calculation of tax and discounts.* Students calculated tax and discounts using the percent proportion. These problems were multistep in nature and asked students to decide if they needed to add or subtract an amount or complete further calculations to arrive at the final solution. An example problem could ask students: “Calculate a 20% discount. Find the sale price. Add a 9% sales tax to arrive at the new total.”

## Additional Materials

Besides paper and pencil practice, students used dry erase boards, markers, and erasers to practice basic skills. Additionally, a Jeopardy-style piece of technology (i.e., Eggspert—see [www.callowayhouse.com](http://www.callowayhouse.com) for details) that allowed students to ring in electronically to give an answer was used to review for tests.

Four-function basic calculators were used to convert between fractions and decimals and to calculate percents, discounts, tax, and some cross products. Spiral notebooks were required and used to keep class notes organized. They were also used for basic skill review problems.

Basic skill worksheets were created and selected by teachers who attended two 1-week summer institutes sponsored by the school district in this action research. Worksheets were selected from re-

producible basic skill workbooks from various publishers including Steck-Vaughn, Instructional Fair, and Frank Schaffer Publications.

## Dependent Variables and Measures

The at-risk group was assessed before and both groups (i.e., at-risk and peer) were assessed and the intervention provided to the at-risk group. These pre- and posttest assessments were teacher-developed and in alignment with grade level expectations and the *CMP* curriculum. Students in both the peer and at-risk groups received the same assessments. Tests and quizzes were not modified for students in the at-risk group. Students were given up to two 50-minute class periods to complete each assessment, depending on individual needs. Four quizzes were also provided during the course of the action research to all students. Quizzes were completed during the 50-minute class period.

## Pre- and Posttest Assessments

The teacher administered a pretest to the at-risk participants in the action research to evaluate their specific needs. This pretest was comprised of a calculator section and a noncalculator section. There were a total of 48 problems on the pretest. The calculator section included 22 problems. Ten problems asked students to convert a fraction, decimal, or percent to its two remaining forms. Two word problems (one unit rate proportion and one nonunit rate proportion) asked students to set up the proportion and solve it. The noncalculator section included 26 problems. Students had two problems that asked them to explain the process used to convert from a decimal to a fraction and from a fraction to a decimal. Three problems were set up as direct proportions with three of four numbers given, and a variable was used to represent the unknown quantity. Students were asked to find the value of  $x$  in the proportion. Students received six problems that asked them to compare two ratios using less than ( $<$ ), greater than ( $>$ ), or equal to ( $=$ ) symbols. They were asked to use the cross-product method for three of the problems and the common-denominator method for the remaining three problems. Three word problems dealt with tax, discounts, and sale prices and were multistep in nature. The last six problems were percent sentences (e.g., “15 is what percent of 45?”). The pretest was scored but not entered as part of the student’s grade. Percentage correct served as the dependent measure.

The posttest was administered to all students (i.e., at-risk and peer groups) and was entered as part of each student’s grade. It included 44 problems. Items that were previously found in only the calculator or noncalculator sections of the pretest were now found in both sections of the posttest. On the noncalculator section (18 problems), two problems asked students to describe the process of converting a fraction to a decimal and a decimal to a fraction. Five problems asked students to convert a fraction, decimal, or percent to its two remaining forms (e.g., “Express .375 as a fraction and as a percent”). Eight problems asked students to find the percent of a number (e.g., “What is 10% of 62?”). Three problems had students calculate a sale price, a discount, and tax. The noncalculator section included 26 problems. Ten problems asked students to convert a fraction, decimal, or percent to its two remaining forms (e.g., “Express 114% as a decimal and as a fraction”). Four word problems had students



set up a proportion and solve it. Two of the word problems were unit rate proportions, and the remaining two problems were nonunit rate proportions. Students were given six problems that had them compare two ratios using less than ( $<$ ), greater than ( $>$ ), or equal to ( $=$ ) symbols. They were asked to use the cross-product method for two of the problems, the decimal-conversion method for two problems, and the common-denominator method for the remaining two problems. The final six problems were percent sentences (e.g., “15 is 60% of what number?”). Students had to find the value of  $x$  in a direct proportion on the pretest, but this type of problem was not directly tested on the posttest because this basic skill was embedded in several other test questions (e.g., word problems, percent sentences). Percentage correct served as the dependent measure.

## Quizzes

Four quizzes were administered to all students during the action research; percentage correct served as the dependent measure. These quizzes were included in the students’ grades. The first quiz covered conversions between fractions, decimals, and percents. Mixed numbers were introduced creating percents over 100%. Decimals were selected that were easily simplified into their fraction form. Percents less than 1% were also assessed. Fractions were selected that converted to terminating as well as repeating decimals. Students were asked to compare two ratios using less than ( $<$ ), greater than ( $>$ ), or equal to ( $=$ ) symbols using the decimal-conversion, cross-products, and the common-denominator methods. There were 13 conversion problems and six ratio-comparison problems (total problems = 19).

The second quiz assessed conversion between fractions and decimals using more difficult numbers and solving percent sentences using the is-of-percent-100 proportion. There were 10 conversion problems and eight percent sentence problems (total problems = 18).

The third quiz assessed each student’s skill in analyzing a word problem and placing it into a proportion to solve for an unknown. Two types of direct proportions were assessed in this quiz—a proportion that sought a unit rate (e.g., per pound, per hour) as a solution and a proportion that asked for a solution other than a unit rate (e.g., if 2 pounds cost \$1.68, then how much do 5 pounds cost?). There were nine problems on this quiz.

The fourth quiz assessed each student’s skill in calculating various percents of a number (26 problems). It also assessed how to calculate tax and discounts and to solve multistep problems (three problems). Total number of problems equaled 29.

## Procedures

Twenty-four instructional days were allocated for the explicit instruction of basic skills and seven instructional days were allocated for inquiry-based lessons taken from the Comparing and Scaling unit of *CMP* for a total of 31 instructional days. All students (in both the at-risk and peer groups) were taught using the same method of instruction during the regular class period. Additionally, the skills taught on Monday, Tuesday, and Wednesday were reviewed during the Thursday double-dose session (described later).

Explicit instruction was used to teach the various skills. The teacher began the class with warm-ups (review problems from previous lessons) for approximately 5-7 min at the beginning of a class period.

I then followed the “I do. We do. You do” model of delivery for the first 10-15 minutes of each lesson. Further, I modeled between five and 10 problems determined by the difficulty and length of a specific skill. The students watched this demonstration. Next, the students practiced one problem at a time with the teacher for a minimum of five problems, depending on the level of difficulty. Students then practiced one problem independently and then compared their calculations and answer with the teacher’s calculations and answer.

After several problems were completed using this process, students used the think-pair-share strategy. This strategy provided quiet time for students to complete a task on their own, an opportunity for them to share their work with a neighbor, and time to share processes and answers. Students then worked independently to complete a series of problems while the teacher circulated to check student progress. When necessary, error correction procedures were provided. The teacher would say, “Watch me do the problem. Now let’s do one together. Now let me watch you do one.” Once students completed several practice problems independently with immediate feedback from the teacher using specific (e.g., “Yes the answer is 18”) and general (e.g., “super”) praise statements, they were given application problems. Lessons ended with a review of strategies taught during the lesson.

After all necessary basic skills had been taught, students from both groups participated in inquiry-based lessons taken from the Comparing and Scaling unit. Students worked in small groups to solve proportional reasoning tasks, participated in small and large group discussions, and presented solutions to these tasks to the class. Students were required to include an explanation of the process used to solve each task in their small group presentations.

The teacher offered a double-dose session each Thursday for 25 minutes during lunchtime. During this time, skills were reviewed and practiced from lessons taught during the week and followed the same procedures previously described for in-class instruction. The double-dose sessions included between six-to-eight of the at-risk participants. Thursdays were selected because they occurred the day before a quiz and could offer additional review after four consecutive class days. The at-risk group was the group targeted for this additional instruction; however, sessions were open to anyone who wanted to attend. Zero, one, or two students from the peer group attended sessions offered during the course of the action research. The exception was the final double-dose session before the posttest. At this session, all students from the at-risk group attended and 12 students from the peer group attended. No individual student from the peer group attended more than two double-dose sessions.

## Instructional Fidelity

An observer (i.e., fellow teacher in the same building as the teacher in this action research) observed instruction during the double-dose sessions for instructional fidelity purposes. She had taught science for 16 years and had formerly taught mathematics at the middle school level. She holds a bachelor’s degree in science education (4-12) and an endorsement in elementary education (K-8). She also earned a master’s degree in education. She received training from the teacher in this action research. During the training, the teacher described the procedures to be observed. The explicit instruction procedure, “I do.

We do. You do” was explained as well as error correction procedures. These procedures were recorded on a form developed by the teacher in this action research. There were three observations made by the observer, and the form was signed to verify that the teacher in this action research followed these procedures. The form included the following points: (a) teacher demonstration of basic skill problems, (b) guided practice problems, (c) independent practice problems, (d) use of positive praise (specific and general), (e) error correction procedures, and (f) the session lasted 25 min. Two observations during the double-dose sessions were conducted. Instructional fidelity was maintained for both observations.

## Results

### Pre- and Posttest Assessments

Large increases were noted across all at-risk participants for noncalculator and calculator assessments. They performed near their peer group level on the posttest assessments.

**Noncalculator assessments.** As shown in Table 1, all at-risk participants demonstrated improved performance on the noncalculator and

calculator assessments. The smallest increase from pretest to posttest was 38 percentage points for Participant 1. Participant 4 demonstrated the largest improvement of 75%. The average increase across all at-risk students was 52.25%. The average posttest performance for the at-risk group was slightly above the peer group’s posttest performance.

**Calculator assessments.** Table 1 shows that all at-risk participants demonstrated large improvements in performance. Participant 4 demonstrated the smallest improvement of 38%, while the largest improvement was 60% by Participant 5. The average increase was 46% resulting in a posttest score near that of their peer group.

### Quizzes

As shown in Table 2, the average quiz performance for the at-risk participants was at or above 73% (range 73.38 to 90.75) across the four quizzes. All at-risk participants performed at or above 60% (Participant 1, quiz 1) with the exception of Participant 6 who performed at 29% on quiz 4. The at-risk participant averages across all four quizzes were similar to those of their peer group. The similarity in average scores is shown in Figure 1.

Table 1

*Calculator and Noncalculator Pretest and Posttest Scores Across At-Risk Participants and Peer Group*

At-Risk Participants	Non-calculator Pretest	Non-calculator Posttest	Non-calculator Gain	Calculator Pretest	Calculator Posttest	Calculator Gain
1	39	77	38	25	83	58
2	35	83	48	33	77	44
3	31	87	56	21	71	50
4	15	90	75	29	61	32
5	35	70	35	17	77	60
6	31	83	52	29	67	38
7	27	83	56	29	72	43
8	39	97	58	38	81	43
At-Risk Average (sd)	31.50 (7.84)	83.75 (8.12)	52.25 (12.52)	27.63 (6.61)	73.63 (7.35)	46.00 (9.55)
Peer Group (n = 49) Average (sd)	n/a (n/a)	82.70 (18.92)	n/a (n/a)	n/a (n/a)	76.60 (16.61)	n/a (n/a)



Table 2

*Quiz Scores Across At-Risk Participants and Peer Group*

At-Risk Participants	Quiz #1	Quiz #2	Quiz #3	Quiz #4	Average
1	78	90	87	74	82.25
2	80	100	90	80	87.50
3	60	95	80	80	78.75
4	70	80	70	89	77.25
5	73	90	80	91	83.50
6	83	83	93	29	72.00
7	70	90	93	80	83.25
8	73	98	93	71	83.75
At-Risk Average (sd)	73.38 (7.17)	90.75 (6.90)	85.75 (8.38)	74.25 (19.48)	81.03 (4.82)
Peer Group (n = 49) Average (sd)	73.70 (18.57)	85.40 (17.59)	84.40 (14.09)	78.90 (21.99)	80.60

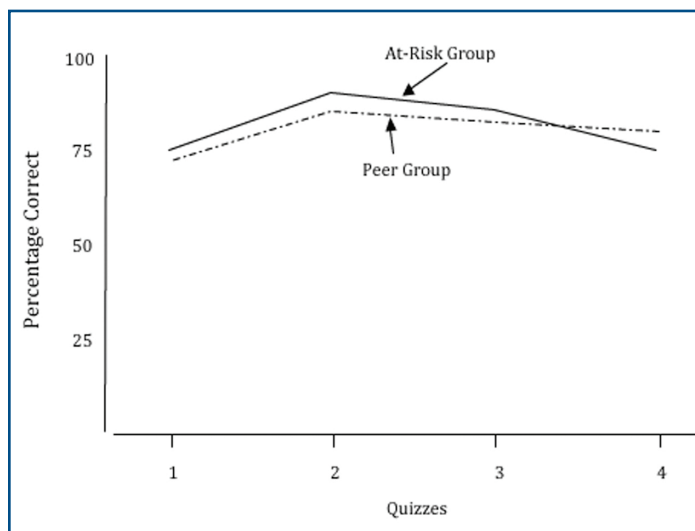


Figure 1. Percentage correct for the quiz performance of at-risk participants and their peer group..

## Discussion

The purpose of this action research was to examine the effects of explicit instruction and double dosing for academically at-risk students in the area of mathematics, specifically ratios, proportions, and percents. Overall, the findings were positive. Results showed that the at-risk participants demonstrated large improvements in mathematics performance. In addition, at-risk participants performed at or near their peer group. These findings show the importance of an explicit method of instruction that emphasizes acquisition of basic skills to better prepare academically at-risk students to participate in their math course. All students from both groups received explicit instruction for the acquisition of basic skills during the regular class period. The same method of instruction was also used during the double-dose sessions each Thursday during lunchtime. Interestingly, higher performance was demonstrated in noncalculator use as compared to calculator use. These findings may be attributed to the increased attention I placed on getting the right answer using paper and pencil and using the calculator only as a means of checking work.

Another positive outcome of this action research was the relative impact that explicit instruction and double dosing had on student at-

titudes toward math, specifically, and school, in general. As students from the at-risk group progressed through the basic skills lesson delivered in an explicit instructional format and double-dose sessions on Thursdays at lunch time, they began to participate more frequently in class discussions. They also began to ask questions for clarification and volunteer answers or ideas during class discussions. Before the action research began, some of the students in the at-risk group had never contributed to a large group discussion.

These results are consistent with results reported by Baker et al. (2002) that showed how beneficial explicit instruction was for low-achieving students. These results also show that with extra assistance and modifications, students at risk for school failure may achieve mastery of the basic skills necessary to participate in everyday activities that involve higher-order thinking skills (Kilpatrick et al., 2001; Woodward & Brown, 2006).

The results of this action research add support to the suggestions of Klein et al. (2005) and the NCTM (2007b) where mathematics instruction that is fast paced includes teacher modeling with many teacher-directed, product-type of questions, and transitions from demonstration to error-free student responding are recommended. Klein et al. note that skills should be mastered before students enter high school. To that end, this action research showed that students who were at risk for academic failure in mathematics were able to perform at levels similar to their peers, thus increasing the likelihood of their success in higher level mathematics.

Action research, by its very nature, may be limited in its ability to control for other possible causal factors (i.e., threats to internal validity; Martella et al., 1999; Stringer & Genat, 2004). Additionally, action research is usually limited in the ability to generalize the results to other settings and/or other students (i.e., external validity; Martella et al., 1999; Stringer & Genat, 2004). As such, the following limitations are present due to the action research focus of the investigation. First, I specifically invited students from the at-risk group to attend the double-dosing sessions. However, access to the double-dose sessions remained open to all students. It is unlikely that only one double-dose session per week that was 25 minutes in length would have a significant impact on student achievement. Student gains were likely attributed to the presentation of well-designed lessons that used the explicit instructional format. In future investigations, more double-dosing sessions should be offered per week and should be offered exclusively to students in the at-risk group to assess the impact of double-dosing.

Second, this action research included a small number of participants. It is unclear to what extent these results would generalize to other students in other settings. Similarly, given that only one teacher (author) implemented the program, it is unclear to what extent these results would generalize to other teachers. Future research should include multiple participants in multiple settings to increase the generalizability of findings.

Third, the instructor was familiar with the participants and enjoyed a close relationship with them; thus, this relationship might have affected the outcomes of the action research. It is likely that the personal relationship that was fostered between the teacher and students had some influence on the students' motivation. Therefore, future research should consider the motivational aspects of teacher-to-student relationships that will affect student performance.

Fourth, the teacher developed the assessments used in this action research; thus, these assessments lacked information on their psychometric properties. Therefore, future investigations should include standardized assessments. On the other hand, teachers many times use assessments they have constructed; thus, the assessments used in this action research may be more representative of what other students are exposed to and, thus, may have greater external validity.

Fifth, given the lack of a true control group, cause-and-effect claims cannot be made. The peer group aids in showing that the at-risk participants performed at or near the level of their peers; however, it is unknown if extraneous variables may have contributed to the improved performance of the at-risk participants. Additionally, because the pretest was only recorded for the at-risk group, the amount of mathematics gain cannot be determined for the peer group. Thus, a comparison cannot be made with regard to gain scores. Future research should use an adequate experimental design to allow for cause-and-effect statements to be made.

Sixth, there was a lack of instructional fidelity. Only two full observations were made by an outside teacher of the double-dose sessions. There were no observations made by an outside teacher during the regular class period. Future investigations should include several observations during both the double-dose sessions and the regular class period. Finally, given that the experimenter collected the data, there was a lack of independent verification of the math performance. Therefore, future investigations should either have an independent evaluator (i.e., another person who administers and scores the assessments) or should include a measure of inter-scoring agreement on the assessments.

In conclusion, explicit instruction and double-dosing have shown great potential in improving math performance of those students who experience difficulties in mathematics (Baker et al., 2002). The results of this action research are especially important given that there is a lack of studies on the use of explicit instruction to teach ratios, proportions, and percentages to middle school students at risk for school failure and on the use of double-dosing to improve these skills.

---

## References

- Anderson, L. W., & Walberg, H. J. (1993). *Timepiece, extending and enhancing learning time*. Reston, VA: National Association of Secondary School Principals.
- Baker, S., Gersten, R., & Lee, D. (2002). A synthesis of empirical research on teaching mathematics to low-achieving students. *The Elementary School Journal*, 103, 45-74.
- Bottoms, G., & Carpenter, K. (2003). *Factors affecting mathematics achievement for students in rural schools*. Atlanta, GA: Southern Regional Education Board.
- Ginsburg, A., Cooke, G., Leinwand, S., Noell, J., & Pollock, E. (2005). *Reassessing U.S. international mathematics performance: New findings from the 2003 TIMSS and PISA*. Washington, DC: American Institutes for Research.
- Gonzales, P., Guzmán, J., Partelow, L., Pahlke, E., Jocelyn, L., Kastberg, D., & Williams, T. (2004). Highlights from the trends in international mathematics and science study (TIMSS) 2003 (NCES 2005-005). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.



- Kilpatrick, J., Swafford, J., & Findell, B. (2001). *Adding it up: Helping children learn mathematics*. Washington, DC: National Academy Press.
- Klein, D., Braams, B., Parker, T., Quirk, W., Schmid, W., & Wilson, W. (2005). *The state of state math standards*. Washington, DC: Thomas B. Fordham Foundation.
- Kroesbergen, E., VanLuit, J., & Maas, C. (2004). Effectiveness of explicit and constructivist mathematics instruction for low-achieving students in the Netherlands. *The Elementary School Journal*, 104, 233-252.
- Lapan, G., Fey, J., Fitzgerald, W., Friel, S., & Phillips, E. (2004). *The Connected Mathematics Project: Comparing and scaling*. Needham, MA: Prentice Hall.
- Lee, J., Grigg, W., & Dion, G. (2007). *The nation's report card: Mathematics 2007* (NCES 2007-494). Washington, DC: National Center for Education Statistics, Institute for Education Sciences, U.S. Department of Education.
- Lemke, M., Sen, A., Pahlke, E., Partelow, L., Miller, D., Williams, T. . . . Joycelyn, L (2004). *International outcomes of learning in mathematics literacy and problem solving: PISA 2003 results from the U.S. perspective*. (NCES 2005-003). Washington, DC: U.S. Department of Education, National Center for Education Statistics.
- Martella, R. C., Nelson, R., & Marchand-Martella, N. E. (1999). *Research methods: Learning to become a critical research consumer*. Needham Heights, MA: Allyn and Bacon.
- Maxwell, L. (2006). Massachusetts schools experiment with extra time. *Education Week*, 26(2), 30-33.
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics: The equity principle*. Reston, VA: Author.
- National Council of Teachers of Mathematics. (2006). *Curriculum focal points for pre-kindergarten through grade 8 mathematics: A quest for coherence*. Reston, VA: Author.
- National Council of Teachers of Mathematics. (2007a). *Effective strategies for teaching students with difficulties in mathematics*. Reston, VA: Author.
- National Council of Teachers of Mathematics. (2007b). *Effective teaching for the development of skill and conceptual understanding of number: What is most effective?* Reston, VA: Author.
- National Mathematics Advisory Panel. (2008). *Foundations for success: The final report of the National Mathematics Advisory Panel*. Jessup, MD: U.S. Department of Education.
- Nolen, A. L., & Vander Putten, J. (2007). Action research in education: Addressing gaps in ethical principles and practices. *Educational Researcher*, 36, 401-407.
- PBS Parents. (2003). *Math disabilities*. Retrieved June 19, 2009, from [http://www.pbs.org/parents/strugglingtolearn/understanding\\_math.html](http://www.pbs.org/parents/strugglingtolearn/understanding_math.html)
- Stein, M., Kinder, D., Silbert, J., & Carnine, D. (2006). *Designing effective mathematics instruction: A direct instruction approach* (4<sup>th</sup> ed.). Upper Saddle River, NJ: Prentice-Hall.
- Stringer, E., & Genat, W. (2004). *Action research in health*. Upper Saddle River, NJ: Pearson Merrill Prentice Hall.
- Woodward, J., & Brown, C. (2006). Meeting the needs of academically low-achieving students in middle grade mathematics. *The Journal of Special Education*, 40, 151-159.

---

## Authors

**Lisa Piper**, M.S., is a teacher at Northwood Middle School in Spokane, Washington. Her research interests are at-risk students, gifted and talented students, explicit instruction techniques, and problem solving.

**Nancy E. Marchand-Martella**, Ph.D., is in the Department of Counseling, Educational, and Developmental Psychology at Eastern Washington University in Cheney, Washington. Her research interests are explicit instruction, adolescent literacy, and academic remediation.

**Ronald C. Martella**, Ph.D., is in the Department of Counseling, Educational, and Developmental Psychology at Eastern Washington University in Cheney, Washington. His research interests are behavior management, positive behavior support, and explicit instruction.

---





# The Efficacy of the RENEW Model: Individualized School-to-Career Services for Youth At Risk of School Dropout

JoAnne M. Malloy, Vidyalakshmi Sundar, David Hagner, Leigh Pierias, and Tara Viet

**Abstract:** This article describes the results of a research project designed to assess the efficacy of a secondary transition model, RENEW (Rehabilitation, Empowerment, Natural supports, Education and Work), on the social and emotional functioning of 20 youth at risk of dropping out of high school using the Child and Adolescent Functional Assessment Scale (CAFAS) supplemented by a case study to illustrate one student's experience. The study indicates that youth who engaged in the RENEW process had significant improvements in functioning in school and at home, and overall positive gains in several behavioral health domains.

## Introduction

There is evidence to indicate that the national high school dropout rate is increasing. A report on high school dropouts sponsored by the Gates Foundation (Bridgeland, Dilulio, & Morison, 2006) indicates that the high school completion rate in the United States is between 68-71 %, and that the dropout rate may be as high as 30 %. This same study shows that the dropout rate approaches 50 % for students who are African American, Hispanic, or Native American. The individual and social costs associated with dropping out are significant, including chronic unemployment and underemployment, higher rates of criminal involvement, greater health problems, and greater dependence on welfare and other public benefit programs (Rumberger, 2001).

In addition to significantly higher dropout rates among students from particular ethnic/minority groups, students are far more likely to drop out of high school if they are poor or if English is their second language (Lan & Lanthier, 2003; Rumberger, 1987). Further, students with disabilities drop out of school at rates twice as high as typically-developing students, and students with emotional disabilities drop out at rates between 35 %-60 % (Scanlon & Mellard, 2002).

Certain individual characteristics are also associated with a high risk of dropping out of high school, including poor functioning in certain behavioral health domains. Students who are having difficulty at home reflected by poor relationships with parents or frequent changes in residence are at high risk of dropping out of school (Suh, Suh, & Houston, 2007). Students who have academic or behavioral problems in school such as poor relationships with peers, truancy (absenteeism), learning challenges, grade retention, social and behavioral problems,

or negative school experiences are far more likely to drop out (Croninger & Lee, 2001; Cullinan & Sanbornie, 2004; Lane, Carter, Pierson, & Glaeser, 2006; Lehr, Hansen, Sinclair, & Christenson, 2003; Nelson, Benner, Lane, & Smith, 2004; Suh et al, 2007). Substance abuse among adolescents is also associated with higher rates of school dropout, as are mental health problems such as depression, suicide attempts or suicidal thoughts, and poor self-concept manifest in disordered thinking about oneself and others (Daniel et al., 2006; Nair, Paul, & Ramany, 2007; Townsend, Flisher, & King, 2007).

Without the proper supports and services, at-risk youth with emotional and behavioral challenges, substance abuse problems, and family challenges may feel detached from the social and academic aspects of the school. Students with emotional and behavioral disorders often misinterpret social cues and possess disordered thinking about their own abilities and social interactions, and thus have difficulties with the social and behavioral demands of school (Lane & Carter, 2006). Many students who drop out believe in external locus of control and may therefore see no utility to persist in their education (Suh & Suh, 2006). Most researchers agree that the act of dropping out of high school is the culmination of a long-term process of student disengagement (Lehr et al., 2003; Suh & Suh, 2006). As Christenson, Sinclair, Lehr, and Hurley (2000) indicate, "Increasing students' engagement and enthusiasm for school is much more than staying in school, and, thus, much more than the dropout problem—it involves supporting students to meet the defined academic standards of the school, as well as, underlying social and behavioral standards" (p. 211).

Interventions that include a strong school-to-career transition framework that links schooling to longer term career goals (Benz, Yovanoff, & Doren,

1997; Bullis & Cheney, 1999; Zigmond, 2006), and bring together multiple agencies, systems, resources, and plans so that the youth and the family can gain access to supportive services appear to have positive outcomes for youth who are at risk of dropping out of high school (Bullis & Cheney, 1999; Malloy, Cheney, Hagner, Cormier, & Bernstein, 1998). Dropout prevention or recovery interventions should also include supports that address the young person's need for control over the planning, development, and implementation of services that will lead to his or her expressed postsecondary goals, along with opportunities for successful academic and social experiences in order to build self-efficacy and the persistence to work towards graduation. There are few such individualized models, however, of services and supports that target both the academic and social needs of students with emotional and behavioral challenges (Carter, Lane, Pierson, & Glaeser, 2006; Wagner & Davis, 2006).

The RENEW (Rehabilitation for Empowerment, Natural supports, Education and Work) model was developed specifically to address the needs of high-risk youth for engagement with others, self-determination skill development, school-to-career planning and intervention, and individualized resource development. The model responds to the need for greater self-determination skill-building and student engagement. RENEW was originally developed and implemented as a transition to employment project for adolescents with serious emotional disturbance (Bullis & Cheney, 1999; Malloy & Cormier, 2004). Program evaluation data indicated that of the participants in this initial demonstration, 83% found employment, 67% completed high school, and 50% participated in postsecondary education or training activities. Involvement with law enforcement and corrections was substantially lower at the end of their participation than at the start of the project (Hagner, Cheney, & Malloy, 1999). Promising results were also reported from a demonstration of youth with disabilities transitioning from the juvenile justice system to the community (Hagner, Malloy, Mazzone & Cormier, 2008).

There is little empirical research of individualized, supportive dropout prevention and recovery interventions that build self-determination skills and positive experiences for high-risk youth (Lane & Carter, 2006; Lehr et al., 2003). The Check and Connect model appears to have the strongest evidence as a successful in-school strategy to build self-efficacy and engagement among students identified as at risk of dropping out of high school (Lehr, Sinclair, & Christenson, 2004). The literature, however, includes little research of the effects of school-to-career interventions with a self-determination component on the behavioral and community functioning of high-risk youth. The purpose of this study was to determine the effect of the RENEW model on how youth at risk of dropping out of high school function in school, home, and community, and on their behavioral health.

## Method

### Participants

The project served a total of 46 students in the two high school communities between April 2003 and December 2005. Students were enrolled in the project based on the following eligibility criteria: (a) significantly below grade level in credits earned; (b) exhibiting significant behavioral problems; or (c) reentering school from an alternative school, juvenile justice placement, or residential treat-

ment program. Participation was not restricted to students eligible for special education services.

Given the open enrollment period of the project and the variety of circumstances of students (a portion of enrollees moved away, dropped out of school, or chose not to participate for varying periods of time), 20 youth were included in the study and completed 3 periods of data collection. The 46 youth who completed the personal futures plan were considered exposed to the intervention.

Table 1 describes the demographic characteristics of the 46 individuals who completed the futures plan, the 20 individuals who were included in the study who completed 3 full sets of data collection, and the 26 students who were exposed to the intervention but who were not enrolled in the study. Independent sample t-test and Chi-square tests were conducted to determine if there were any significant differences between students in the study and those who were not in the study. There were no significant differences in the demographic and academic characteristics of the youth from the two groups (see Table 1). There were 10 females and 10 males in the research cohort and the average age at enrollment of the 20 students was similar to that of the 26 who were not in the study. Four students (20%) of the 20 study participants were not of European-American descent, consistent with the percentages of all enrollees and a slightly higher rate for dropouts. Two of the 20 students (10%) were high school dropouts at the time of enrollment. The demographic characteristics of the cohort of 20 students were, in general, consistent with all enrollees and subgroups.

### Setting

The RENEW data described here are drawn from a dropout prevention project entitled APEX (Achievement in Dropout Prevention and Excellence). The APEX project applied the three-tiered Positive Behavior Interventions and Supports (PBIS) behavioral support model (Carr et al., 2002; Sugai & Horner, 1999) as the dropout prevention strategy, with RENEW as the intensive (tier 3) strategy for students who were failing, who could not attend the regular high school program, who had dropped out, or who were otherwise at great risk of failing. The APEX project was implemented in two New Hampshire high schools with the highest dropout rates. One of the high schools is in a mill town in central New Hampshire, which had experienced significant job loss and a declining property tax base during the previous two decades. The high school is in a poor community and had an annual dropout rate of 16.8% the year prior to the start of the project, compared to the state average annual dropout rate of 5.8%.

The second high school was in one of the largest cities in New Hampshire, which had experienced significant growth in its immigrant and minority populations. The high school is located in the only New Hampshire region that was designated as an empowerment zone in the late 1990s due to a high concentration of poor families. This high school experienced an annual dropout rate of 10.8% when the APEX project was begun. The grant-funded study was embraced in both high schools as it provided a resource for reducing the number of school dropouts.

### Procedures

Two full-time RENEW facilitators were assigned to each high school. Each facilitator received over 40 hours of training in the



Table 1

*Demographic Characteristics of Participants*

	All Freq (%) or Mean (SD)	Study Participants Completed One Year Follow-Up Freq (%) or Mean (SD)	Nonstudy Participants Freq (%) or Mean (SD)
n	46 (100 %)	20 (43.5 %)	26 (56.5 %)
Gender			
Female	22 (47.8 %)	10 (50 %)	12 (46.2 %)
Male	24 (52.2 %)	10 (50 %)	14 (53.8 %)
Race/Ethnicity			
White	42 (91.3 %)	16 (80 %)	26 (100 %)
Minority	4 (8.7 %)	4 (20 %)	0
Language			
English	45 (97.8 %)	19 (95 %)	26 (100 %)
Spanish/Other	1 (2.2 %)	1 (5 %)	0
Age	14.8 (.67)	14.8 (.79)	14.9 (.58)
GPA	1.2 (.81)	1.3 (.64)	1.2 (.94)
Credits Earned	3.3 (2.13)	3.5 (1.05)	3.2 (2.21)
Attendance	173.5 (24.74)	175.4 (20.80)	172.0 (27.71)
Absence	34.1 (34.50)	40.2 (40.3)	29.4 (29.27)

RENEW process. Students were referred for RENEW services by the school's administrators, guidance counselors, special education staff members, and teachers. Eligible students were those who (a) were behind grade level in terms of credits (due to truancy or academic failure); (b) exhibited significant behavioral problems; (c) were returning to the community from an alternative school, juvenile justice, or residential treatment; (d) were, for behavioral, social, or academic reasons, unable to attend classes or a traditional school day (i.e., in need of an alternative method to attain graduation); or (e) were recent (within the past year) dropouts. The RENEW intervention was not restricted to students with specific documented behavioral or emotional diagnoses. RENEW services were available to any student with significant impairment in school or community functioning.

Students were referred to the RENEW facilitators, who then met with the students and their parents or guardians to engage in the orientation and consent process. Students and parents/guardians who agreed to participate signed a consent form and were then provided personal futures planning and individualized service development over the course of 12 months.

The RENEW model is designed to create a context within which trusting and reciprocal relationships, self-determined behaviors, and career-related plans and activities can be developed using eight strategies: (a) personal futures planning, (b) individualized team development and wraparound services, (c) individualized resource development, (d) flexible education programming, (e) individualized school-to-career planning, (f) employment, (g) mentoring, and (h) connections to community-based resources and networks. Personal futures planning is the lynchpin of the process, helping to elicit the youth's perspective on his or her history, current network of people and supports, strengths, dislikes, dreams, and concerns. The facilitator then helped each youth to develop a detailed plan in the context of the young person's desired educational, employment, and adult life goals. The facilitators worked with each young person for approximately 12 months to develop the plan, organize the support team, gain acceptance and support for the plan among key agencies and individuals, and assist the participants to act on their goals.

Individualized education programming is a critical element of the RENEW service and support process. To address the challenge of how to help students gain credits in nontraditional ways, the RENEW

facilitators worked with students to develop a pathway for graduation that was unique to each student's futures plan. This process often included an assessment of credits needed and barriers to be addressed, with careful consideration of choice of class or teacher, support needs such as tutoring or guided study, and work-based learning experiences such as internships, paid work experiences that can include coursework, or volunteer experiences. The facilitators also helped the youth address their goals for employment by linking students with the resources in their formal or informal networks to obtain jobs. Finally, the facilitator was a primary conduit for communication between the youth, family members, school staff and key providers such as mental health counselors or juvenile probation and parole officers. A detailed description of the process is provided elsewhere (Malloy & Cormier, 2004).

## Measures

This study was conducted in two phases: a quantitative analysis of outcomes related to functioning using a standardized functional assessment instrument and a case study to illustrate how functional improvement led to the student's ability to achieve her goals, complementing the findings from the first phase. The dependent measures included total and subscale scores on the Child and Adolescent Functional Assessment Scale, or CAFAS (Hodges & Wong, 1996; Hodges, Wong, & Latessa, 1998). CAFAS data were collected at three points, a baseline assessment at intake, a second data point at approximately six months, and a third data point at approximately 12 months. The CAFAS is designed to assess "impairment in day-to-day functioning secondary to emotional, behavioral, psychological, psychiatric, or substance use problems" (Hodges, Xue, & Wotring, 2004, p. 327) and has been used to measure intervention outcomes with at-risk youth. The CAFAS is completed in about 10 minutes by a trained interviewer. Test-retest reliability of .78 and inter-rater reliability of .92 have been reported (Hodges & Wong, 1996). Moderately high correlations validity of .42 - .62 have been reported with other measures of youth problem behavior, and significant positive relationships between CAFAS scores and other concurrent measures, including parents' problem ratings and juvenile justice involvement, have been reported (Hodges & Wong, 1996). We did not perform our own reliability study on our sample; however, the project's research associate was trained and certified to administer the CAFAS by certified CAFAS trainers and maintained CAFAS certification throughout the project. The research associate was required to demonstrate inter-rater reliability of .9 on the sample case. In addition, the sensitivity of the CAFAS to assess the impact of interventions and change over time has been reported (Hodges et al., 2004).

The CAFAS instrument reports scores on eight subscales: School/Work, Home, Community, Behaviors Toward Others, Moods/Emotions, Self-Harmful Behavior, Substance Use, and Thinking. Each subscale contains behavioral descriptors that are rated according to level of impairment, resulting in a numerical score for each item. The items are grouped by four levels of severity: severe (severe disruption or incapacitation), moderate (persistent disruption or major occasional disruption of functioning), mild (significant problems or distress), and minimal or no impairment (no disruption of functioning). The scores associated with the levels are 30, 20, 10, and 0, respectively. No intermediate scores are assigned. Higher scores indicate greater

impairment. Semi-structured interviews were performed with RENEW participants and their parents/guardians at six-month intervals to collect information and score the CAFAS. Data collection consisted of a 30-minute parent interview and a 15-minute student interview. The interviews were conducted at the time of enrollment and again after six months and one year of involvement with RENEW services.

For the case study phase, a purposeful sampling procedure was used to select a project participant who illustrated the implementation of RENEW components and made substantial functional progress as measured by the CAFAS. The case study consisted of examination of written case notes, school records, and in-depth interviews with the participant and the RENEW facilitator (Yin, 2009). These data were used to construct a profile of the young person's experience pre-, during, and post-intervention.

## Results

### CAFAS Data

Table 2 shows the CAFAS subscale scores, and total CAFAS scores of the 20 study participants who were administered the CAFAS on three occasions. On average, three months elapsed between these students' enrollment in the project and their first CAFAS assessment, four months between the first and second CAFAS administrations, and five months between the second and third CAFAS administrations.

To test the average change in total CAFAS scores observed over time, a repeated measures analysis of variance with simple contrast was used (Portney & Watkins, 2000). Partial eta squared ( $\eta^2$ ) was used to compute effect size for the CAFAS total score, since a single within subjects design was used. Partial eta squared is defined as the proportion of the total variability that is attributable to the effect. Contrast tests were also conducted to identify differences between specific pairs of scores. In cases where the sphericity assumption for the repeated measures ANOVA was not met, Greenhouse-Geisser correction was applied.

There was a significant main effect of RENEW participation on behavioral functioning between waves 1 and 3,  $F(2, 18) = 14.84$ . A moderate effect size of .44 was observed for the CAFAS total score. Behavioral subscale contrasts revealed that functional impairments in school/work behavior,  $F(2, 18) = 12.06$ ; home behavior,  $F(2, 18) = 5.64$ ; moods and emotions,  $F(2, 18) = 8.45$ ; and self-harmful behavior,  $F(2, 18) = 3.91$  were significantly lower between waves 1 and 3. Figure 1 shows the trend in the marginal means for all eight subscales and the CAFAS total scale across waves 1 - 3.

### Case Study

The second phase of the study involved an illustrative case study of a single participant. Project staff selected an illustrative case example of a participant who illustrated the implementation of key features of RENEW, such as alternative education planning and the importance of linking school to career interests, and who was particularly disengaged from school upon enrollment and had attained significant benchmarks such as graduation or promotion to the next grade through the course of the project. An in-depth case study analysis method was used (Yin, 2009).

A young woman we will call Chrissy was 17 years old when her guidance counselor referred her for RENEW services. She had very



Table 2

Repeated Measures ANOVA for CAFAS Scores of Participants Who Completed Futures Plans and Had Three Waves of Data

N = 20	Wave 1 Mean (SD)	Wave 2 Mean (SD)	Wave 3 Mean (SD)	F Value
School/Work	27.5 (5.50)	22.5 (8.51)	14.0 (11.88)	12.06**
Home	11.5 (10.89)	7.0 (8.01)	4.5 (6.9)	5.64*
Community	5.0 (6.88)	7.0 (8.01)	3.0 (6.57)	2.32
Behavior Toward Others	7.5 (5.50)	7.0 (5.71)	7.0 (5.71)	.11
Moods/Emotions	16.0 (10.46)	14.5 (9.99)	10.0 (9.73)	8.45**
Self-Harmful Behavior	8.5 (10.89)	6.5 (9.33)	2.0 (5.2)	3.91*
Substance Use	13.5 (12.26)	14.5 (13.95)	11.0 (12.52)	1.23
Thinking	.50 (2.24)	0 (0)	0 (0)	1.00
CAFAS Total Score	90.0 (6.77)	79.0 (8.88)	51.5 (6.70)	14.84**

\*p-value < .05.

\*\*p-value < .01.

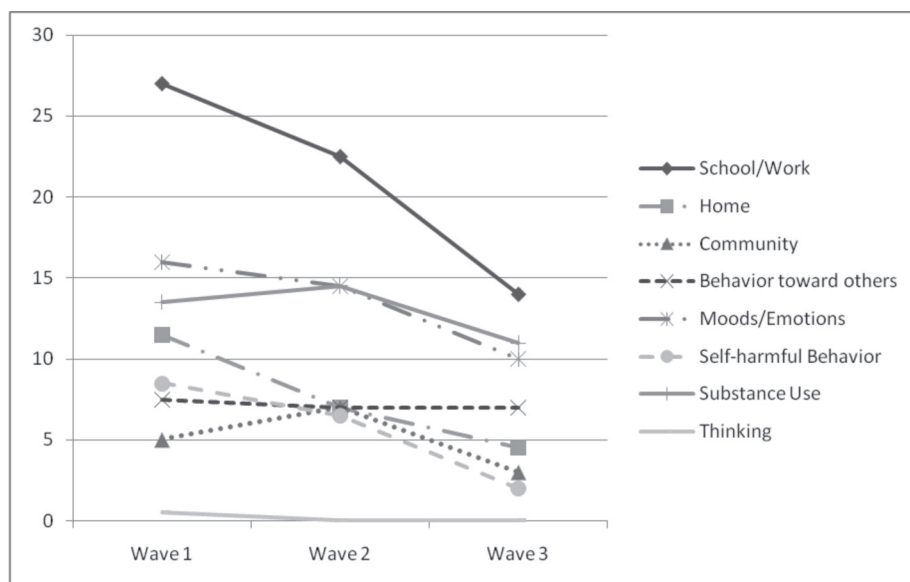


Figure 1. Marginal means of CAFAS scores by subscale.

few credits toward graduation, had missed a significant number of school days, and had few friends. Her guidance counselor described Chrissy as a very bright girl with “a lot of behavior issues... she’s from a dysfunctional home.” Teachers and administrators described her as confrontational. Chrissy presented with a rough exterior showcased with multiple piercings, tattoos, and an all black wardrobe.

After the RENEW facilitator spent some time with Chrissy to get to know her and to explain the RENEW process, the first step was the development of Chrissy’s personal futures plan. During her personal futures planning meetings, Chrissy described her history, including her parents’ separation when she was four years old, how her family moved frequently, how she had an abusive boyfriend in 9<sup>th</sup> grade, how she lost a friend to suicide, how she was molested as a child, and her involvement with drugs. She described herself as having low self-esteem, that she was shy with people she didn’t know, not good at setting goals, and having poor time

management skills. Her dreams were to be skinny, go to college, become either a psychologist or dental hygienist, have a family and live on a nonworking farm where she can enjoy the peace and space. Chrissy perceived her obstacles to be her poor choice of friends, her drug use, and her low self-esteem. She set four goals: to be successful in high school, get a job, go to college, and increase her self-esteem.

The RENEW facilitator developed a detailed plan based on Chrissy's goals and support needs which included attaining the credits she needed to graduate. Chrissy accomplished each of her goals in the subsequent two years. Throughout Chrissy's high school career she had to go back to the drawing board numerous times to tweak what wasn't working. Individualized resource development and flexible educational programming utilized included the Jobs for America's Graduates (JAGS) program (a U.S. Department of labor program to help low-income youth with employment and career development), Nova Net credit recovery (a computer-based program that allows students to gain credit in a variety of subject areas), Peer Mediation, the school's Student Assistance Program, home tutoring, and an alternative placement in order to stay engaged in her high school program and complete the requirements for a diploma. Flexible educational programming also included a correspondence course, and employment assistance included arranging multiple job shadowing experiences and informational interviews in order to explore and define her career interests.

During her senior year Chrissy attended the high school's winter carnival and went on the senior field trip with friends. She became less and less isolated from her fellow students and she gained more confidence. In June, Chrissy graduated from high school and enrolled in college for the fall. During the interview, Chrissy reflected on why she had quit school, noting that "I didn't fit in...the other kids were into things that didn't interest me and I had no friends here. No one seemed to care if I came to school so I just stopped going. When I sat down to plan with Kate (the RENEW facilitator), I realized that I could do it, but I had to put my mind to it."

The CAFAS scores for Chrissy reflect her improvements in home and school functioning across the three data collection points. Her CAFAS School/Work domain scores were 20, 30, and 10 respectively for each data point, showing an initial deterioration but then significant improvement. Her Home subscale score improved from a 10 to 0. There was no change in her Moods/Emotions score (20/20/20), Behavior towards others score (10/10/10), or Substance Abuse score (20/10/20). The Self-harmful Behavior score went from 0 to a high of 20 at the second data point, but went back down to 0 at the third data point. She had scores of 0 throughout in the Community and Thinking subscales. Clearly, Chrissy's CAFAS interviews and the surveys with teachers showed improvement in her functioning at school and in her home.

## Discussion

Adolescents who experience high risk of failure in school and in their communities are often not engaged in activities that are designed to foster self-determination and individualized, positive development. These youth may be on the receiving end of school- and community-based punishments and experience social isolation. It appears that this cohort of youth who received RENEW services and for whom

we have comprehensive CAFAS data experienced significant improvement in their functioning in school, which is a primary area of functioning that the model is designed to impact. The conversation and supports that take place with students around school and career during the RENEW personal futures planning process may act as a catalyst for positive action and increased positive perceptions of the future. The improvements seen in the Home subscale indicate that family relationships benefit as the student develops a plan and begins to experience greater success in school.

In addition to the practical, career-related benefits that the youth receive, it appears that the RENEW intervention produces therapeutic benefits as well. The provision of personal futures planning and services that support self-determination appear to have a positive effect on the agency and functioning of young people with emotional challenges, including in some of their personal, psychological, and relational domains. For example, the CAFAS results indicate improvements in the Moods and Emotions and the Self-harm sub-scales, areas of personal functioning that are painful for the young person and tend to require substantial community resources to address. The positive results in these subscales indicate that the RENEW model may improve the young person's self-views and perception of his or her prospects and capabilities, benefits that will improve the youth's ability to successfully transition to adult life and to participate in the community. The results indicate that interventions that stress self-determination strategies based upon the participant's goals, dreams, and perceived needs can positively impact the trajectory and emotional health of youth at high risk of school and community failure. The CAFAS scales that showed less improvement, including the Behavior Towards Others, Substance Use, and Community Subscales, may indicate that these youth could benefit from greater behavioral support, substance abuse treatment, and "coaching" around social interactions.

This study suggests that adolescents who are at high risk of dropping out may function better at home and at school when they have experiences that lead to greater self-determination and success, and they begin to have more positive views of themselves and of their prospects. These improvements in functioning may indicate an enhanced attachment to the people in school and to the educational process. Further, relationships with and perceptions of parents improve when the youth used the RENEW process, indicating that successful experiences may result in fewer disruptions at home.

The RENEW approach to individualized education planning (or alternative education planning) embraces the importance of a challenging learning experience that is linked to the individual's interests, skills, talents, and needs. The resources and time required to develop alternative coursework and educational supports appears to be beneficial in terms of positive educational and personal outcomes. The individualized alternative programs developed in the RENEW model make use of programs and services already available in most schools, and may typically require a revision of stringent eligibility criteria (to enter a vocational or adult education program, for example) and carefully planned supports (such as a system for "checking in" and identifying problems before there is a crisis). It appears that many participants have responded positively to these types of supports.

Although RENEW service provision requires an investment of resources for the one-on-one time required to engage students and

provide the supports and services, it appears that this investment is likely to reap benefits for the young person in about a year or less. As such, the RENEW intervention is less costly than incarceration, residential care, or many alternative day school programs, making the most of resources that already exist in the community and using the young person's social network. Further, the RENEW facilitator develops new and repairs existing relationships so that the participant will have a support network after RENEW services are faded. A person-centered, outcome-based transition approach such as RENEW identifies paid support services (mental health services, vocational rehabilitation, one-stop services) and entitlement programs (Social Security benefits, Medicaid, among others) as means toward the end results of a career, continued education, employment, and independent living.

## Study Limitations

There are several limitations of this study that should be noted. First, the RENEW intervention in the high school was provided as part of a three-tiered PBIS system of social and behavioral supports and services, and, as such, the positive effects for many of the youth may have been a result of the RENEW intervention in combination with Tier 2 supports. Second, the study group was a self-selecting sample of students. The study participants included only those youth who were engaged in services long enough for collection of three waves of CAFAS data, and the sample was not drawn in a way that we can assume that it is representative of all high-risk youth in each high school. For example, youth participation was voluntary. Those who participated in this study were ready to and interested in engaging with the RENEW facilitators.

We did not measure level of participation, mix of services, or quantity of RENEW services received. Given these limitations in sampling and service measures, it cannot be concluded that the RENEW intervention caused the positive outcomes reflected here. Finally, the small sample size does not allow for widespread generalization of the findings. What can be claimed, however, is that the intervention appears to have promise as a secondary transition and therapeutic model for this population of youth.

## Recommendations for Future Research

Youth who are at high risk of dropping out of school have multiple and complex support needs. They are difficult to engage, and any intervention must intentionally conduct outreach and engage the youth, "where they're at" in order to be effective. The RENEW model should undergo a more rigorous controlled study, including randomized controlled trials that will give greater depth to the findings produced here and to determine if the model has an impact on youth who may not initially be motivated to participate.

The RENEW model is a comprehensive planning process that includes a set of eight interventions geared to and adjusted by each young person's individual needs, goals, and support network. This study does not show which and to what extent the interventions were used by the participants and it is possible that some components of the model may be more effective than others. Additional studies that assess dosage and mix of interventions may provide knowledge about which components of the RENEW model are most effective.

In addition, case studies of RENEW participants indicate that self-determination skills and motivation are increased for youth who experience RENEW supports and services. A study of these "mediating factors" could help to explain why and how the RENEW model impacts growth and positive self-perceptions. Further, the therapeutic (clinical) benefits, as well as the processes by which youth begin to act on their own behalf in a more positive way given the RENEW intervention should be studied.

More documentation of the impact and application of individualized alternative educational programs can help educators and other supporters to design plans for their students that will keep them engaged and help them to graduate on time. It is clear that there is a need to provide more individualized, yet challenging interventions based upon the terms set forth by the youth. Additional study can help contribute to our knowledge of how at-risk youth can be more successful, and can contribute to more effective in-school and mental health community-based services. As such, we could begin to recover the numerous students who drop out of high school and develop early intervention services so that fewer students choose to drop out.

## References

- Benz, M., Yovanoff, P., & Doren, B. (1997). School-to-work components that predict post school success for children with and without disabilities. *Exceptional Children*, 63(2), 151-165.
- Bridgeland, J. M., DiIulio, J. J., & Morison, K. B. (2006). *The silent epidemic: Perspectives of high school dropouts*. Washington, DC: Civic Enterprises LLC.
- Bullis, M., & Cheney, D. (1999). "Vocational and transition interventions for adolescents and young adults with emotional or behavioral disorders." *Focus on Exceptional Children* 31(7), p.1-24.
- Carr, E. G., Dunlap, G., Horner, R. L., Turnbull, A. P., Sailor, W., Anderson . . . Fox, L. (2002). Positive behavioral support: Evolution of applied science. *Journal of Positive Behavioral Interventions*, 4(1), 4-16.
- Carter, E. W., Lane, K. L., Pierson, M. R., & Glaeser, B. (2006). Self-determination skills and opportunities of transition-age youth with emotional disturbance and learning disabilities. *Exceptional Children*, 72(3), 333-346.
- Christenson, S. L., Sinclair, M. F., Lehr, C. A., & Hurley, C. M. (2000). Promoting successful school completion. In K. M. Minke & G. C. Bear (Eds.), *Preventing school problems-Promoting school success* (pp 211-257). Bethesda, MD: National Association of School Psychologists.
- Croninger, R. G., & Lee, V. E. (2001). Social capital and dropping out of high school: Benefits to at-risk students of teachers' support and guidance. *Teachers College Record* 103(2), 548-581.
- Cullinan, D., & Sabornie, E. J. (2004). Characteristics of emotional disturbance in middle and high school students. *Journal of Emotional and Behavioral Disorders*, 12(3), 157-167.
- Daniel, S. S., Walsh, A. K., Goldston, D. B., Arnold, E. M., Reboussin, B. A., & Wood, F. B. (2006). Suicidality, school dropout, and reading problems among adolescents. *Journal of Learning Disabilities*, 39(6), 507-514.



- Hagner, D., Cheney, D., & Malloy, J. (1999). Career-related outcomes of a model transition demonstration for young adults with emotional disturbance. *Rehabilitation Counseling Bulletin*, 42(3), 228-242.
- Hagner, D., Malloy, J., Mazzone, M. W., & Cormier, G. (2008). Youth with disabilities in the criminal justice system: Considerations for transition and rehabilitation planning. *Journal of Emotional and Behavioral Disorders*, 16(4), 240-247.
- Hodges, K., & Wong, M. M. (1996). Psychometric characteristics of a multidimensional measure to assess impairment: The Child and Adolescent Functional Assessment Scale. *Journal of Child and Family Studies*, 5(4), 445-467.
- Hodges, K., Wong, M. M., & Latessa, M. (1998). Use of the Child and Adolescent Functional Assessment Scale (CAFAS) as an outcome measure in clinical settings. *Journal of Behavioral Health Services and Research*, 25(3), 325-336.
- Hodges, K., Xue, Y., & Wotring, J. (2004). Use of the CAFAS to evaluate outcome for youths with severe emotional disturbance served by public mental health. *Journal of Child and Family Studies*, 13(3), 325-339.
- Lan, W., & Lanthier, R. (2003). Changes in students' academic performance and perceptions of school and self before dropping out of school. *Journal of Education for Students Placed at Risk*, 8(3), 309-332.
- Lane, K. L., Carter, E. W., Pierson, M. R., & Glaeser, B. C. (2006). Academic, social, and behavioral characteristics of high school students with emotional disturbances or learning disabilities. *Journal of Emotional and Behavioral Disorders*, 14(2), 108-117.
- Lane, K. L., & Carter, E. W. (2006). Supporting transition-age youth with and at risk for emotional and behavioral disorders at the secondary level: A need for further inquiry. *Journal of Emotional and Behavioral Disorders*, 14(2), 66-70.
- Lehr, C. A., Hansen, A., Sinclair, M., & Christenson, S. L. (2003). Moving beyond dropout towards school completion: An integrative view of the literature. *School Psychology Review*, 32(3), 342-364.
- Lehr, C. A., Sinclair, M. R., & Christenson, S. L. (2004). Addressing student engagement and truancy prevention during the elementary school years: A replication study of the Check & Connect model. *Journal of Education for Students Placed at Risk*, 9(3), 279-301.
- Malloy, J. M., & Cormier, G. (2004). Project RENEW: Building the community's capacity to support youths' transition from school to adult life. In D. Cheney (Ed.), *Transition of secondary students with emotional or behavioral disorders: Current approaches for positive outcomes* (pp. 180-200). Arlington, VA: Council for Children with Behavioral Disorders.
- Malloy, J. M., Cheney, D., Hagner, D., Cormier, G. M., & Bernstein, S. (1998). Personal futures planning for youth with EBD. *Reaching Today's Youth*, 2(4), 25-29.
- Nair, M. K. C., Paul, M. K., & Ramany, J. (2007). Prevalence of depression among adolescents. *Indian Journal of Pediatrics*, 17(6), 523-524.
- Nelson, J. R., Benner, G. J., Lane, K., & Smith, B. W. (2004). Academic achievement of K-12 students with emotional and behavioral disorders. *Exceptional Children*, 71(1), 59-73.
- Portney, L. G., & Watkins, M. P. (2000). *Foundations of clinical research: Applications to practice*. Upper Saddle River, NJ: Prentice Hall Health.
- Rumberger, R. W. (1987). High school dropouts: A review of issues and evidence. *Review of Educational Research*, 57(2), 101-121.
- Rumberger, R. W. (revised 2001). *Why students drop out of school and what can be done*. Paper prepared for the conference, "Dropouts in America: How Severe is the Problem? What Do We Know About Intervention and Prevention?" Civil Rights Project. Cambridge, MA: Harvard University.
- Scanlon, D., & Mellard, D. F. (2002). Academic and participation profiles of school-age dropouts with and without disabilities. *Exceptional Children*, 68(2), 239-258.
- Sugai, G., & Horner, R. H. (1999). Discipline and behavioral support: Preferred processes and practices. *Effective School Practices*, 17, 10-22.
- Suh, S., & Suh, J. (2006). Educational engagement and degree attainment among high school dropouts. *Educational Research Quarterly*, 29(3), 11-20.
- Suh, S., Suh, J., & Houston, I. (2007). Predictors of categorical at-risk high school dropouts. *Journal of Counseling & Development*, 85(1), 196-203.
- Townsend, L., Flisher, A. J., & King, G. (2007). A systematic review of the relationship between high school dropout and substance use. *Clinical Child and Family Psychology*, 10(4), 295-317.
- Wagner, M., & Davis, M. (2006). How are we preparing students with emotional disturbances for the transition to young adulthood?: Findings from the National Longitudinal Transition Study-2. *Journal of Emotional and Behavioral Disorders*, 14(2), 86-98.
- Yin, R. (2009). *Case study research: Design and methods* (4<sup>th</sup> ed.). Thousand Oaks CA: Sage.
- Zigmond, N. (2006). Twenty-four months after high school: Paths taken by youth diagnosed with severe emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders*, 14(2), 99-107.

---

## Authors

**JoAnne M. Malloy**, M.S.W., is a Project Coordinator at the Institute on Disability at the University of New Hampshire. Ms. Malloy's area of interest centers on secondary transition, educational outcomes and career development for youth with emotional and behavioral disorders.

**Vidyalakshmi Sundar**, Ph.D., is a Research Associate at the Institute on Disability at the University of New Hampshire, and focuses on quantitative analysis for community-based disability research projects.

**David Hagner**, Ph.D., is an Associate Professor in Special Education at the Institute on Disability at the University of New Hampshire. Dr. Hagner conducts demonstration research in the areas of secondary transition and employment for people with disabilities.

**Leigh Pierias**, B. S., was a Research Associate the Institute on Disability at the University of New Hampshire when the RENEW project was conducted.

**Tara Viet**, M.Ed., was a RENEW Facilitator and is currently a guidance counselor in a New Hampshire High School. Ms. Viet has focused on individualized intensive support services for youth with emotional and behavioral disorders.

---

# Predicting the Academic Functioning of Youth Involved in Residential Care

Annette K. Griffith, Alexandra L. Trout, Michael H. Epstein, Calvin P. Garbin, Robert Pick, and Tanya Wright

**Abstract:** Youth involved in residential care programs present with significant difficulties across behavioral and mental health domains. Although this is a group that is also at considerable risk for academic failure, very little research has been done to understand the academic functioning of this population. The current study sought to expand what is known about this population and examine factors that are predictive of their levels of academic functioning. Results from 208 youth indicated that at the time of entry into residential care youth were performing in low average ranges across academic areas. While several variables were identified as predictors for level of academic functioning (e.g., IQ, age at admission, race/ethnicity, special education identification, and gender), variables particularly relevant for youth in residential care programs (e.g., behavior, number of previous schools attended) did not serve as predictors. Implications for practice and future research are discussed.

## Introduction

There are currently over 100,000 youth being served in residential group care settings across the United States (Child Welfare League of America [CWLA], 2005). Previous research examining the characteristics of this population has consistently indicated that these are youth who demonstrate numerous and significant risks in areas of behavior and mental health (Baker, Kurland, Curtis, Alexander, & Papa-Lentini, 2007; Connor, Doerfler, Toscano, Volungis, & Steingard, 2004; CWLA, 2005). Specifically, it has been found that the majority of youth experience clinical levels of both internalizing and externalizing problem behavior (Baker et al., 2007; CWLA, 2005) and as many as 80-93 % of youth are eligible for a DSM-IV diagnosis (CWLA, 2005; Lyons, Libman-Mintzer, Kisiel, & Shalcross, 1998). In addition, youth involved in residential care often have histories of negative behaviors that put them at risk for poor long-term outcomes (e.g., criminal activity, substance abuse, suicidal behavior; Baker et al., 2007; Connor et al., 2004; CWLA, 2005; Duppong Hurley et al., 2009).

While the available information about the mental health and behavioral status of youth involved in residential group care programs is continually increasing, there is remarkably little known about the academic functioning of this group (Trout, Hagaman, Casey, Reid, & Epstein, 2008). This is problematic as academic functioning has been found to be related to a host of other factors later in life. Specifically, youth who do not have at least basic levels of academic functioning are more likely than their same-aged peers to drop out of high

school, fail to attend postsecondary institutions, or have high levels of unemployment (Perie, Grigg, & Donahue, 2005). In addition, poor academic functioning has also been identified as a prominent risk factor for antisocial and criminal behavior in adolescence and adulthood (Ary et al., 1999; Burton & Marshall, 2005).

Studies examining academic functioning of youth across the United States have found that a large proportion of youth do not have even basic skills necessary for gainful employment. For example, the 2003 National Assessment of Adult Literacy (Kutner, Greenberg, Jim, & Paulsen, 2006) found that nearly one out of seven adults had mastered only basic literacy skills such as identifying key information in a short paragraph, and Perie et al. (2005) report that the level of math required to work at an entry-level job as a production assistant in a factory has already reached a point where roughly half of high school graduates are not qualified. Given the high numbers of youth in the general population who do not have at least minimal academic skills, it is particularly important to identify the levels of academic functioning for at-risk groups such as youth in residential care. Factors such as frequent moves or school changes prior to entering residential care may place these youth at a greater risk for falling behind in school or may impede the special education identification process for those who need it (Courtney, Roderick, Smithgall, Gladden, & Nagaok, 2004; Malmgren & Meisel, 2002).

In order to identify the academic functioning of youth involved in residential care, we examined the literature base and conducted a systematic review of previous research (Trout et al., 2008). The review specifically sought to identify the academic



status of youth who were involved in out-of-home care placements by examining research conducted on this topic over the past 60 years. Findings highlighted that very little research has been conducted in regards to the academic functioning of these youth. In addition, several problems were identified with the research that had been conducted. Specifically, findings were not generalizable due to lack of clear definitions of content areas (e.g., general label of "math" vs. specific areas such as calculation, fluency, applied problems) and use of measures of achievement that were not standardized (e.g., teacher ratings, school grades). Despite these limitations, the overall findings indicated that teachers reported youth involved in residential care programs to be academically at risk, and to perform below grade level and in low-to-low-average ranges across academic areas (Blair, 1992; Evans, 2004; Jones & Landsverk, 2006).

While some general conclusions could be drawn from the review of the literature, more questions were generated than were answered. Therefore, in order to expand what is known about the academic functioning of youth involved in out-of-home care and to address some of the limitations identified in previous research (e.g., unclear subject areas, lack of standardized measurement), we conducted a study examining the academic functioning of youth at entry to a residential group care program (Trout et al., 2008). At the time of entry, 127 youth completed the Woodcock Johnson Test of Academic Achievement, 3<sup>rd</sup> Edition (WJ III; Woodcock, McGrew, & Mather, 2001). The results of that study verified some of the findings of earlier studies, that youth involved in residential care had, on average, low levels of academic functioning using a widely-accepted, standardized measure of academic achievement. However, it also highlighted the fact that these youth were a very heterogeneous population. Specifically, we found that scores on the WJ III ranged from "low-average and below" (< 89) to "high average and above" (> 111). This would suggest that youth involved in residential care may require various types of academic programming, ranging from remedial education to access to gifted and talented programs, and that academic evaluation to select the appropriate type of programming is necessary.

Due to the heterogeneity of youth entering residential care programs, the ability to predict which youth are likely to have low levels of academic functioning using some key variables would be valuable to residential care providers who may work with a large number of youth who often enter care at multiple points within the school year. Identification of appropriate services and programs hinges on the ability to distinguish between youth who have high levels of academic functioning versus those who have low levels (Eckert, 2005). Previous research has indicated that academic functioning can be predicted by a variety of factors such as maternal education level, access to an enriched home environment, prior academic challenges, ethnicity, gender, discipline records, literacy rate, attendance, mobility rate, and involvement in extracurricular activities (Davis-Kean, 2005; Halle, Kurtz-Costes, & Mahoney, 1997; Magnuson, 2007; Steinberg, Lamborn, Dornbusch, & Darling, 1992). While some of these factors may be difficult to obtain for youth who may have had multiple placements (e.g., attendance, involvement with extracurricular activities) or who have limited involvement with family members (e.g., maternal education level), some of these variables are key ones that are routinely collected at the time of intake and may be useful for identifying youth at risk for low levels of academic functioning.

Therefore, the purpose of the present study was to expand what is known about the academic functioning of youth at their time of entry into residential care. Specifically, we sought to continue our previous study in order to gain a large enough sample to answer some more complex questions. The primary goal was to go beyond basic descriptive information and to identify variables commonly available to residential care staff at the time of entry that may be predictive of academic functioning. However, in order to provide a context and more detailed information on the sample, results are also presented that describe the demographics of these youth at their time of entry into residential care and provide descriptive information about their level of functioning on a standardized measure of academic achievement.

## Method

### Participants

Two hundred and eight youth admitted to Boys Town (BT) Home Campus residential group care program in Omaha, Nebraska, between September 2006 and May 2008, participated in this study. All youth entering BT during this time period were recruited to participate, 12 declined.

### Data Sources

Data were collected from two sources: youth files created at admission to BT through interviews with the youth's parent/guardian (admission procedures to follow), and admission data completed following the youth's orientation to the BT program. For organizational purposes, information is divided and presented in three fields: demographic, academic, and behavior.

**Demographics.** Data on demographic characteristics were collected from admission files collected when youth entered BT. Variables included: (a) age at admission, (b) gender, (c) race/ethnicity, (d) IQ, (e) medication status, (f) age at first placement, (g) special education status, (h) number of previous schools attended before BT, and (i) placement status immediately before coming to BT using the Restrictiveness of Living Environment Scales (ROLES; Hawkins, Almeida, Fabry, & Reitz, 1992). The ROLES identifies 25 placement categories that include highly restrictive (e.g., jail, state mental hospital), medical (e.g., inpatient drug-alcohol rehabilitation centers, medical hospitals), shelter and foster care (e.g., group emergency shelter, specialized foster care), supervised living alone or with a family friend or relative, family home (e.g., home of natural parents), and independent living settings (e.g., living independently by self or with a roommate). Each category is assigned a numerical rating (i.e., 1 = jail to 25 = independent living by self) indicating level of restrictiveness. Lower ratings mean more restrictive placement categories. The ROLES is a widely used measure that has begun to show promise as being psychometrically sound with adequate levels of reliability (Hawkins, et al., 1992).

**Academic.** Academic achievement was measured at admission using the WJ III (Woodcock et al., 2001). The WJ III is a widely used, psychometrically sound, and norm-referenced assessment designed to individually assess academic achievement of persons between the ages of 2 and 99. For the purpose of this study, seven subtests were administered: (a) Reading Fluency, (b) Calculation, (c) Spelling, (d) Writing Fluency, (e) Reading Comprehension, (f) Applied Problems,



and (g) Academic Knowledge. These subtests were selected to go beyond assessing basic reading and math skills, and were combined to create a composite score indicating overall academic ability. The reliability coefficients for the seven administered subtests of the Woodcock Johnson range from .77 to .94.

**Behavior.** Data on youth behavior were collected from the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) completed by youth, parents, or guardians when youth were admitted to BT. The CBCL is a 120-item checklist that assesses the competencies and problem behaviors of children and youth between the ages of 4 to 18. The CBCL provides a total problem behavior score, two total score scales for internalizing and externalizing behaviors, and eight specific syndrome scores (i.e., anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems, rule-breaking behavior, and aggression). Assessments of the psychometrics of the CBCL have found it to have satisfactory levels of validity and reliability, with coefficients ranging from .39 to .96 (Achenbach & Rescorla, 2001).

## Procedure

Prior to data collection, all procedures were approved by the internal review boards (IRBs) at both the University of Nebraska-Lincoln and BT. Data were collected at two points in time. First, at the time of admission, BT admission staff interviewed youth and their caregivers using a standard procedure. During the interview, questions were asked about the youth's previous out-of-home placements, physical and mental health status, and basic demographic information to create a youth and family history. At this time, parents or caregivers were asked to complete the Child Behavior Checklist (CBCL). These three measures were combined to create a youth file.

Second, following the admission interview, youth were referred to one of five graduate student data collectors for academic assessment. Each student was informed of the purpose of the study, allowed to ask questions, and asked to sign an assent form prior to assessment. Once assent was obtained, each student was individually administered the seven subtests of the WJ III. Administration time varied in length from 45 minutes to 2 hours depending on the ability and persistence of the student.

## Training

Each of the persons responsible for data collection completed a standardized training procedure prior to collecting data. For organizational purposes, the training procedures for the collection of the admissions data and the WJ III are presented separately.

**Admission data.** Training for BT admission staff was a four-step process. First, admission staff were required to complete a weeklong training seminar that presented information about the BT program and issues regarding youth and family confidentiality. Second, staff completed a training seminar where specific admission procedures were presented. Third, intake staff began a 3-week shadowing program with experienced staff to observe admission data collection procedures. Finally, once the job-shadowing program was complete, both new and experienced staff collected data for the same sets of youth and families. Data collection was independent and continued until a 90 % level of agreement was consistently obtained. This phase lasted approximately 30 to 90 days.

**Academics.** A two-step training process was used to train the five graduate student data collectors. First, to collect academic data, the student data collectors completed a weeklong training seminar that discussed participant confidentiality, data collection procedures, and administration and scoring of the WJ III. At this time, all data collection procedures were modeled by experienced data collectors. Second, once training was complete, the experienced data collectors observed while student data collectors administered and scored the WJ III in practice situations. All data collectors were required to meet 90 % fidelity of administration and scoring prior to administering any assessment to youth at BT. In addition, every three months during data collection, an evaluator familiar with testing and scoring procedures conducted a follow-up fidelity check to ensure that all data collectors remained above 90 %. Mean fidelity scores for the three fidelity checks were 96 %, 92 %, and 94 %, respectively.

## Data Analysis

Data were analyzed in three phases. First, descriptive analyses were conducted to provide a summary of the demographic characteristics of students who participated in this study. Second, data were cleaned to ensure that outliers and/or skewness were identified and appropriate transformations were conducted (e.g., Winsorizing). In the third phase, a standard multiple regression analysis was conducted. The analysis used the WJ III scores as the criterion variable and the following variables as predictors: age, gender, ethnicity, IQ, ward-of-state status, age at first placement, special education status, number of schools attended before BT, medication status, and internalizing and externalizing CBCL scores. These variables were selected because they are ones that are commonly collected for youth at their time of entry into residential care (Baker, Wulczun, & Dale, 2005; Handwerk et al., 2006). Once the multiple regression analysis was completed (e.g., Cook's Distance, Standardized DFFit, and Standardized DfBeta), additional analyses were also conducted to assess for influential cases.

## Results Demographics

Of the 208 youth who agreed to participate in the study, 40.4 % were girls ( $n = 84$ ). Youth were predominantly Caucasian (50.0 %,  $n = 104$ ), followed by African American (47,  $n = 22.6$  %), two or more races (22,  $n = 10.6$  %), Hispanic (7.7 %,  $n = 16$ ), or other (e.g., Native American, Asian; 9.2 %,  $n = 19$ ). On average, youth were 15.5 ( $SD = 1.5$ ) years old with a range from 10.9 to 18.8. They were at an average grade level of 9.3 ( $SD = 1.6$ ) and had been to an average of 5 schools ( $SD = 2.1$ ) prior to BT. The majority of youth came from a home setting (e.g., family home, home of a relative; 38.5 %,  $n = 80$ ) or from some type of out of home care (e.g., group home, foster care; 29.3 %,  $n = 61$ ). Only 22.6 % ( $n = 47$ ) came from a detention or correctional setting. However, the average scores on the Child Behavior Checklist indicated borderline levels of Internalizing behavior ( $M = 60.0$ ,  $SD = 10.0$ ), and clinical levels of Externalizing ( $M = 67.8$ ,  $SD = 9.3$ ) and Total Problem behaviors ( $M = 64.8$ ,  $SD = 9.3$ ). Overall, the youth scored within the average range on measures of IQ ( $M = 95.5$ ,  $SD = 12.1$ ) and 29.3 % ( $n = 61$ ) had a special education identification.

## Academic Functioning

Table 1 presents the means, standard deviations, and score distributions for the WJ III. Mean scores for each of the seven administered subtests and the overall composite score were below the means for the normative group ( $M = 100$ ,  $SD = 15$ ). Youth scored lowest among areas of academic knowledge ( $M = 86.5$ ,  $SD = 12.6$ ), applied problems ( $M = 90.2$ ,  $SD = 9.8$ ), and passage comprehension ( $M = 90.2$ ,  $SD = 11.7$ ), with roughly half of youth scores (60.6% for academic knowledge, 47.1% for applied problems, 44.2% for passage comprehension) in the “low average and below” range (i.e.,  $> 89$ ). Students had the highest scores in the spelling subtest, with over half of students (73.1%) scoring in the average range (i.e., 90 to 110) or above.

**Table 1**

*Academic Functioning as Measured by the Woodcock Johnson Test of Academic Achievement, 3rd Edition*

WJ III Subscale	M (SD)	Range
Reading Fluency	91.43 (13.62)	60 - 145
Calculation	91.02 (12.74)	57 - 123
Spelling	97.74 (14.38)	50 - 133
Writing Fluency	94.16 (15.35)	51 - 141
Passage Comprehension	90.22 (11.73)	42 - 130
Applied Problems	90.19 (9.84)	66 - 139
Academic Knowledge	86.54 (12.63)	52 - 126
Overall Academic Composite Score	91.61 (10.03)	61.86 - 126.29

## Predicting Academic Functioning

A standard multiple regression analysis was conducted to determine if youth variables readily available at the time of admission to residential care (i.e., age, gender, ethnicity, IQ, ROLES at admission, age at first placement, special education status, number of schools attended before BT, medication status, and internalizing and externalizing CBCL scores) could be used to build a model that would be predictive of academic functioning (i.e., WJ III scores) at the time of intake and if so, which variables would provide significant, unique contributions to that model.

Data cleaning led to transformations of the variables to reduce number of outliers. The majority of the variables used were already normally distributed, however, Winsorizing (using 25% and 75% Tukey hinges) of 1-4 data points per variable was used for age at admission, number of schools attended, IQ, and externalizing behavior.

In addition, following the multiple regression analysis, analyses for influential cases indicated the presence of one influential case. As a result, that case was removed and the analyses were rerun.

Findings from the rerun multiple regression analysis indicated that the model was significant for predicting WJ III scores at intake,  $R^2 = .537$ ,  $F(10, 98) = 11.35$ ,  $p < .001$ , accounting for almost 54% of the variance in the WJ III scores. In this model, IQ, age at admission, race, special education identification, and gender provided unique and significant contributions to the model (see Table 2). Examination of the correlations and beta weights indicated that age at admission served as a suppressor variable, with its relationship to WJ III scores at admission being mediated by the relationship between IQ and special education identification.

**Table 2**

*Predicting Academic Achievement Using Variables Available at Entry to Residential Care*

Variables	Correlation With WJ III Scores at Intake	Beta
Gender	0.24***	0.20**
Ethnicity	0.35***	0.26***
Age	-0.07	-0.19**
IQ	0.64***	0.54***
ROLES at Admission	-0.02	-0.07
Special Education Identification	-0.25***	-0.23**
Number of Schools Attended Before BT	0.13*	0.10
Medication Status	0.18**	0.01
CBCL Internalizing Behavior	0.14*	0.10
CBCL Externalizing Behavior	-0.02	-0.12

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

## Discussion Demographics

Based on the demographic information available for the youth, it appears as though they are a group with a high level of risk. Specifically, they have experienced multiple school placements, have a

higher level of special education identifications than would typically be found in the general population (U.S. Department of Education, 2007), are coming from placements other than the family home (with almost one quarter coming from placements with high levels of restrictiveness, e.g., correctional centers), and have clinical levels of problem behavior. These findings are consistent with previous studies that have examined the characteristics of youth involved in residential care (Connor et al., 2004; Duppong Hurley et al., 2009).

## Academic Functioning

Although very little work has been done examining the academic functioning of youth involved in residential care, the current findings are consistent with previous studies and extend the findings of our previous study. Specifically, it was found that these youth performed below average on the overall score of academic functioning and across academic areas. Of particular concern were low scores in areas of basic academics that are required for more complex skills (e.g., reading fluency, calculation, writing fluency). According to Mastropieri et al. (2006), as students progress through school there is a greater expectation on independent learning. If students do not have basic skills, they cannot be expected to do well as academic demands become greater. This is evidenced as the areas of lowest performance were in those areas where more complex skills are needed (e.g., passage comprehension, applied problems, and academic knowledge). When taken together with findings that these youth have high levels of behavioral and mental health problems, low levels of academic functioning place them at an even greater risk for poor long-term adult outcomes across a variety of domains (e.g., educational attainment, employment, interpersonal relationships).

## Predicting Academic Functioning

The results of this study indicate that variables commonly obtained during intake can be used to predict the level of academic functioning for youth in residential care programs. It was found that at the time of entry, IQ, gender, ethnicity, special education status, and age all provided unique contributions to the multiple regression model. Specifically, it was found that males were more likely to have lower levels of academic functioning, as were youth with lower IQs, youth with special education identifications, minority youth, and youth who entered residential care at an older age.

With the exception of gender, these findings are consistent with those of previous studies. In regards to gender, several studies have found that there is not a relationship between gender and academic achievement. Although it is a commonly held assumption that males do better in academics than females, particularly in areas of science and math, this is not actually the case (Geist & King, 2008). Similar levels of performance have been found between males and females for both typically developing youth (Huffman & Spear, 2000) and those with behavioral disorders (Nelson, Benner, Lane, & Smith, 2004). These findings have been consistent across several decades (Geist & King, 2008). Therefore, future research is warranted in an attempt to replicate the current findings. Other research examining gender differences at the time of entry into residential care has found that females tend to have a higher number of risk factors than males (e.g., multiple family problems, out-of-home placements, eating disorders, experiences with physical and/or sexual abuse; Connor et al.,

2004; Handwerk et al., 2006). Therefore, findings that females are still likely to have higher levels of academic functioning than males is surprising. Future research that attempts to identify key school-related differences between males and females (e.g., involvement in extracurricular activities, discipline records, attendance) involved in residential care may be useful for determining why these differences in academic functioning are present.

All of the other variables that provided unique, significant contributions to the multiple regression model influenced academic achievement in ways that were consistent with previous research. Specifically, previous research has found medium to high positive correlations between IQ and scores of academic achievement as measured by the WJ III. This was found to be true for both typically developing youth (McGrew & Woodcock, 1991) and those with behavioral disorders (Lavin, 1996; Naglieri & Lauder, 2006). As such it is not surprising that for youth in the current study, IQ was a predictor of academic achievement. Although other variables were also predictive of WJ III scores, IQ had the largest beta weight in the multiple regression model, indicating that it contributed more to the explained variance than did any of the other variables. Therefore, IQ is a particularly important variable to consider when attempting to predict the academic functioning of youth involved in residential care.

Previous research examining the relationship between academic functioning and special education status reported similar findings. Research has indicated that youth with a variety of disabilities (e.g., learning disabilities, behavior disorders) tend to perform below average on measures of academic functioning (Lane, Barton-Arwood, Nelson, & Wheby, 2008; Walker & Nabuzoka, 2007). For example, Nelson et al. (2004) reported that students with behavioral disorders performed below average across multiple areas of academic functioning (e.g., reading, math, science). This finding was one that is consistent across studies examining academic functioning of youth with disabilities (DeShazo Barry, Lyman, & Grofer, 2002; Walker & Nabuzoka, 2007). Thus, while IQ may play an important role in the prediction of academic functioning, other variables such as special education status are also relevant to consider.

Youth ethnicity is also an important factor to consider, as previous research has indicated that minority youth tend to perform lower on tests of academic achievement than do Caucasian youth (Morgan & Mehta, 2004; Roach, 2004). Ethnicity, like special education status, has been reported to be related to academic functioning across subject areas. Although minority youth are more likely to be identified for special education services (Hosterman, DuPaul, & Jitendra, 2005), the contribution of ethnicity for the current model was independent of the influence of special education status. Although reasons for this are unclear, it may be related to the quality of schools youth attended prior to entering residential care. In one study by Fassold (2000), it was reported that schools attended by predominantly Caucasian students were rated as superior in quality than schools attended by predominantly minority students. It was also reported that schools attended by predominantly Caucasian students have improved in quality at a much greater rate than have schools attended by predominantly minority students. While additional research is needed to identify the specific reasons for academic discrepancies across ethnic groups, in the current study ethnicity did serve as a unique predictor to the model.



The final variable that contributed to the multiple regression model was age at admission. Within the model, this variable provided a suppressor effect in that it did not correlate significantly with WJ III scores, yet it provided a unique, significant contribution to the model. Further examination of the data revealed that age at admission has a role in the prediction of academic achievement, but that the prediction is mediated by both IQ and special education status. Although further research is needed to identify the exact relationship between IQ, special education status, age at admission, and how this relationship influences scores of academic achievement, this finding is consistent with previous research that has indicated that for youth who have a special education identification (e.g., behavior disorder, learning disability), younger students perform more like their typically-developing peers than do older students (Mastropieri et al., 2006; Nelson et al., 2004). The reasons for this may vary, but as youth get older and progress through school, the demands that are placed upon them increase (Mastropieri et al., 2006). Specifically, youth are required to do much more learning on their own by obtaining information from textbooks (Mastropieri et al., 2006) and they have to engage in more complex thinking (Mastropieri, Scruggs, Boon, & Carter, 2001).

Due to similar relationships that have been identified in previous research, it is not surprising that gender, IQ, special education identification, ethnicity, and age at admission were predictive of academic functioning in the current study. What was surprising, however, was that other variables that are particularly relevant for youth involved in residential care did not provide a unique predictive contribution. Specifically, it would be expected that youth who experienced early placements, who had multiple school placements, who had high levels of problem behavior, and/or who were taking medications for psychosocial problems would be at greater risk for lower levels of academic achievement than other youth who had not experienced these factors. Previous research has indicated that each of these variables have been associated with lower levels of academic achievement (Haveman, Wolfe, & Spaulding, 1991; Malmgren & Gagnon, 2005; Mantzicopoulos & Knuston, 2000; Undheim & Sund, 2008). Why these variables did not provide a unique contribution in the current study cannot be determined at this point; however, additional research to examine this issue is warranted. It is possible that differing patterns of behaviors, medication use, and academic history affect level of functioning in different ways and that more detailed examinations of these factors will be necessary to identify what these patterns may be.

## Limitations

There are several limitations of the current study that should be noted. First, all data were obtained for youth at entry to one residential program in the Midwest. Youth who enter this program come from across the United States; however, it is possible that the characteristics of the youth entering this program are different from those who are involved with other residential care programs. Additional research with youth from other residential care programs would be beneficial for determining the generalizability of these results. Second, the demographic information reported in this study was obtained using archived data from admission files. While this ensured that variables used as predictors in the multiple regression analysis were those that are routinely collected during admissions procedures at BT, it remains

unclear as to whether or not these same variables are also routinely collected at other residential care programs. In addition, the limited number of variables available for collection did restrict the description that could be provided for these youth and the variables that could be used as predictors. For example, the CBCL is the behavior measure that is used by BT clinical staff and, therefore, was the only measure of behavior that could be used as a predictor in the current study. Additional research is needed to identify the specific key domains for which data are collected by residential care programs across the United States and how different variables within these domains may differentially influence prediction of academic achievement.

## Future Research

In addition to studies that address the current limitations, future research should focus on three areas. First, the current study should be replicated with a larger sample size that is representative of multiple residential facilities. Doing so would allow for additional and more complicated analyses to be conducted that are more representative of the population as a whole. If a larger sample were obtained, academic functioning could not only be compared across groups (e.g., males versus females, younger versus older youth), but also predictors for these specific groups could be identified. It is possible that variables that predict academic functioning for one group (e.g., males) may be different than for another group (e.g., females). Second, research needs to identify other areas of risk for youth involved in residential care programs. Specifically, youth entering residential care programs may be at risk for language deficits, poor functional academic skills, and/or poor use of learning strategies. Assessment across these areas and identification of predictors for youth who perform in below average levels will help to identify those youth who have additional areas of need. Finally, information on the academic functioning of youth needs to be monitored across time (i.e., at entry, during care, and at departure) to identify any gains that are made. It is important to understand if youth make academic gains while in care, in order to evaluate the programming that is in place. Also, by identifying predictors of gain (e.g., study skills, attendance, homework completion), a better understanding may emerge of what factors influence academic growth for this population.

## Implications and Conclusion

The findings of this study are largely consistent with those from previous research and indicate that youth entering residential care programs do so with a variety of risk factors and are likely to also present with low levels of academic functioning. As a result, it is important for staff of residential care programs to be aware of potential problems in academics in addition to the more commonly addressed areas of behavior and mental health. Moreover, due to the heterogeneity of functioning levels for youth entering residential care, knowledge of factors that may be predictive of lower levels of academic functioning will be important for programs where assessment is difficult or not possible. While there are many factors that will play a role in how well youth perform academically (e.g., maternal education level, enrichment of the home environment, attendance in classes, homework completion), knowledge of some key predictive variables, commonly collected at intake, may help staff in identifying youth who may be at a level of risk.

## REFERENCES

- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for ASEBA school-age forms & profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.
- Ary, D. V., Duncan, T. E., Biglan, A., Metzler, C. W., Noell, J. W., & Smolkowski, K. (1999). Development of adolescent problem behavior. *Journal of Abnormal Child Psychology*, 27, 141-150.
- Baker, A. J. L., Kurland, D., Curtis, P., Alexander, G., & Papa-Lentini, C. (2007). Mental health and behavioral problems of youth in the child welfare system: Residential treatment centers compared to therapeutic foster care in the Odyssey Project population. *Child Welfare*, 86, 97-123.
- Baker, A. J. L., Wulczyn, F., & Dale, N. (2005). Covariates of length of stay in residential care. *Child Welfare Journal*, 84, 363-386.
- Blair, R. (1992). Applications of the life-impact curriculum. *Journal of Emotional and Behavioral Problems*, 1, 16-21.
- Burton, J. M., & Marshall, L. A. (2005). Protective factors for youth considered at risk of criminal behavior. Does participation in extracurricular activities help? *Criminal Behavior and Mental Health*, 15, 46-64.
- Child Welfare League of America. (2005). *The Odyssey Project: A descriptive and prospective study of children and youth in residential group care and therapeutic foster care*. Washington, DC: Author.
- Connor, D. F., Doerfler, L. A., Toscano, P. F., Volungis, A. M., & Steingard, R. J. (2004). Characteristics of children and adolescents admitted to a residential treatment center. *Journal of Child and Family Studies*, 13, 497-510.
- Courtney, M. E., Roderick, M., Smithgall, C., Gladden, R. M., & Nagaok, J. (2004). *The educational status of foster children*. Chicago, IL: Chapin Hall Center for Children.
- Davis-Kean, P. E. (2005). The influence of parent education and family income on child achievement: The role of parental expectations and the home environment. *Journal of Family Psychology*, 19, 294-304.
- DeShazo Barry, T., Lyman, R. D., & Grofer, L. (2002). Academic underachievement and attention-deficit/hyperactivity disorder: The negative impact of symptom severity on school performance. *Journal of School Psychology*, 40, 259-283.
- Duppong Hurley, K., Trout, A., Chmelka, M. B., Burns, B., Epstein, M., Thompson, R., & Daly, D. (2009). Are the mental health needs of youth admitted to residential group care changing? Comparing mental health status at admission for youth in 1995 and 2004. *Journal of Emotional and Behavioral Disorders*, 17, 164-176.
- Eckert, T. L. (2005). Improving children's educational outcomes by advancing assessment and intervention practices: An overview of the special series. *School Psychology Review*, 34, 4-8.
- Evans, L. D. (2004). Academic achievement of students in foster care: Impeded or improved? *Psychology in the Schools*, 41, 527-535.
- Fassold, M. A. J. (2000). Disparate impact analyses of TAAAS scores and school quality. *Hispanic Journal of Behavioral Sciences*, 22, 460-480.
- Geist, E. A., & King, M. (2008). Different, not better: Gender differences in mathematical learning and achievement. *Journal of Instructional Psychology*, 35, 43-52.
- Halle, T. G., Kurtz-Costes, B., & Mahoney, J. L. (1997). Family influences on school achievement in low-income African American children. *Journal of Educational Research*, 89, 527-537.
- Handwerk, M. L., Clopton, K., Huefner, J. C., Smith, G. L., Hoff, K. E., & Lucas, C. P. (2006). Gender Differences in Adolescents in Residential Treatment. *American Journal of Orthopsychiatry*, 76, 312-324.
- Haveman, R., Wolfe, B., & Spaulding, J. (1991). Childhood events and circumstances influencing high school completion. *Demography*, 28, 131-157.
- Hawkins, R. P., Almeida, M. C., Fabry, B., & Reitz, A. L. (1992). A scale to measure restrictiveness of living environments for troubled children and youths. *Hospital & Community Psychiatry*, 43, 54-58.
- Hosterman, S. J., DuPaul, G. J., & Jitendra, A. K. (2005). Teacher ratings of ADHD symptoms in ethnic minority students: Bias or behavioral difference? *School Psychology Quarterly*, 23, 418-435.
- Huffman, L. R., & Spear, P. W. (2000). Academic performance among at-risk children: The role of developmentally appropriate practices. *Early Childhood Research Quarterly*, 15, 167-184.
- Jones, L., & Landsverk, J. (2006). Residential education: Examining a new approach for improving outcomes for foster youth. *Children and Youth Services Review*, 9, 81-100.
- Kutner, M., Greenberg, E., Jin, Y., & Paulsen, C. (2006). *The health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy* (NCES 2006-483). U.S. Department of Education. Washington, DC: National Center for Education Statistics.
- Lane, K. L., Barton-Arwood, S. M., Nelson, J. R., & Wheby, J. (2008). Academic performance of students with emotional and behavioral disorders served in self-contained settings. *Journal of Behavioral Education*, 17, 43-62.
- Lavin, C. (1996). Scores on the Weschler Intelligence Scale for Children – Third edition and Woodcock-Johnson Test of Academic Achievement – Revised for a sample of children with emotional handicaps. *Psychological Reports*, 79, 1291-1295.
- Lyons, J. S., Libman-Mintzer, L. N., Kisiel, C. L., & Shalcross, H. (1998). Understanding the mental health needs of children and adolescents in residential treatment. *Research and Practice*, 29, 582-587.
- Magnuson, K. (2007). Maternal education and children's academic achievement during middle childhood. *Developmental Psychology*, 43, 1497-1512.
- Malmgren, K. W., & Gagnon, J. C. (2005). School mobility and students with Emotional Disturbance. *Journal of Child and Family Studies*, 14, 299-312.
- Malmgren, K. W., & Meisel, S. M. (2002). Characteristics and service trajectories of youth with serious emotional disturbance in multiple service systems. *Journal of Child and Family Studies*, 11, 217-229.
- Mantzicopoulos, P., & Knuston, D. J. (2000). Head Start children: School mobility and achievement in the early grades. *The Journal of Educational Research*, 93, 305-311.
- Mastropieri, M. A., Scruggs, T. E., Boon, R., & Carter, K. B. (2001). Correlates of inquiry learning in science: Constructing concepts of density and buoyancy. *Remedial and Special Education*, 22, 130-137.

- Mastropieri, M. A., Scruggs, T. E., Norlan, J. J., Berkeley, S., McDuffie, K., Holloran Tornquist, E., & Connors, N. (2006). Differentiated curriculum enhancement in inclusive middle school science: Effects on classroom and high-stakes tests. *The Journal of Special Education, 40*, 130-137.
- McGrew, K. S., & Woodcock, R. W. (1991). *Woodcock-Johnson III technical manual*. Itasca, IL: Riverside Publishing.
- Morgan, S. L., & Mehta, J. D. (2004). Beyond the laboratory: Evaluating the survey evidence for the disidentification explanation of the Black-White differences in achievement. *Sociology in Education, 77*, 82-101.
- Naglieri, J. A., & Lauder, B. Y. (2006). WISC-III and CAS: Which correlates higher with achievement for a clinical sample? *School Psychology Quarterly, 21*, 62-76.
- Nelson, J. R., Benner, G., Lane, K., & Smith, B. W. (2004). Academic achievement of K-12 students with emotional and behavioral disorders. *Exceptional Children, 71*, 59-73.
- Perie, M., Grigg, W., & Donahue, P. (2005). The nation's report card: Reading 2005 (NCES 2006-451). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.
- Roach, R. (2004). The great divide. *Black issues in Higher Education, 21*, 22-25.
- Steinberg, L., Lamborn, S. D., Dornbusch, S. M., & Darling, N. (1992). Impact of parenting practices on adolescent achievement: Authoritative parenting, school involvement, & encouragement to succeed. *Child Development, 63*, 1266-1281.
- Trout, A. L., Hagaman, J. L., Casey, K., Reid, R., & Epstein, M. H. (2008). The academic status of children in out-of-home care: A review of the literature. *Children and Youth Services Review, 30*, 359-374.
- Undheim, A. M., & Sund, A. M. (2008). Psychosocial factors and reading difficulties: Students with reading difficulties drawn from a representative population sample. *Journal of Psychology, 49*, 377-384.
- U.S. Department of Education. (2007). *2006 Annual report to Congress on the Individuals with Disabilities Education Act*. Washington, DC: Author.
- Walker, A., & Nabuzoka, D. (2007). Academic achievement and social functioning of children with and without learning difficulties. *Educational Psychology, 27*, 635-654.
- Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson III*. Itasca, IL: Riverside Publishing.

---

## Authors

**Annette K. Griffith**, Ph.D., is an Assistant Research Professor at the Center for At-Risk Children's Services at the University of Nebraska-Lincoln. She is interested in understanding more about youth who are involved in out-of-home care and in examining interventions to help improve their outcomes.

**Alexandra L. Trout**, Ph.D., is an Assistant Research Professor at the Center for At-Risk Children's Services at the University of Nebraska-Lincoln. She is interested in the academic functioning of youth in out-of-home care and in interventions to help them maintain academic gains upon their transitions back to the family home.

**Michael H. Epstein**, Ed.D., is the director of the Center for At-Risk Children's Services and the William Barkley professor at the University of Nebraska-Lincoln. His interests involve interventions for youth with emotional and behavioral disorders.

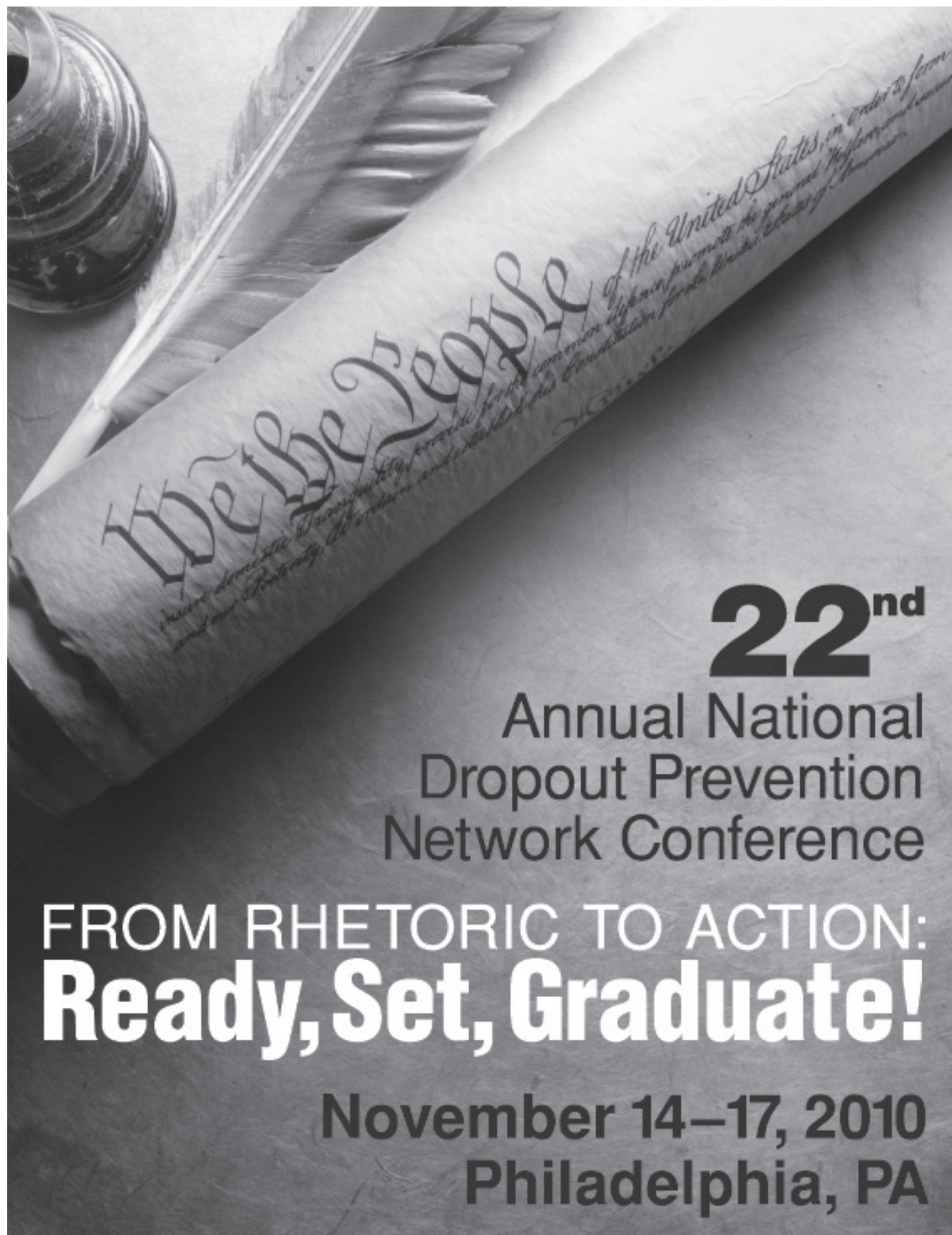
**Calvin P. Garbin**, Ph.D., is a Professor in the Psychology department at the University of Nebraska-Lincoln. His interests are in research and statistical methodologies.

**Robert Pick** is a Vice President at the Youth Care division at Boys Town. He has an interest in understanding the needs of youth in out-of-home settings and in identifying interventions that will help to improve their academic and social outcomes.

**Tanya Wright** is the Director of Special Education at Boys Town. She has an interest in understanding more the academic needs of youth in residential settings.

---





**22<sup>nd</sup>**  
Annual National  
Dropout Prevention  
Network Conference

FROM RHETORIC TO ACTION:  
**Ready, Set, Graduate!**

November 14–17, 2010  
Philadelphia, PA

