



NCSE | National Center for School Engagement

Quantifying School Engagement: Research Report

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303 E. 17th Avenue, Suite 400 Denver, CO 80203**

Promoting attendance, attachment and achievement

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Introduction

The Colorado Foundation for Families and Children (CFFC) received funding from the Office of Juvenile Justice and Delinquency Prevention (OJJDP) to evaluate their Truancy Reduction Demonstration Program. As part of this evaluation, CFFC created the National Center for School Engagement (NCSE). One function of NCSE was to develop an instrument to measure students' school engagement in order to assess whether interventions in three intensive demonstration sites had an effect on student engagement. This article explains the process by which NCSE created the student school engagement survey and summarizes the preliminary data about the reliability and validity of the instrument¹.

Background of School Engagement

For decades, educators and educational researchers have been interested in the effects of students' attitudes about school and their experiences in school on achievement and attendance. Researchers have conceptualized these attitudes and experiences in a variety of ways, with little consistency in methods and theory.² Researchers have used a multitude of terms to describe what they think is important to study when it comes to attitudes and experiences.

Klem and Connell (2004) discuss different concepts that have been used. For instance, Marks (2000) conceptualized engagement as “a psychological process, specifically, the attention, interest, and investment and effort students expend in the work of learning.” Connell and colleagues defined and measured two forms of engagement: ongoing engagement, which includes student behavior, emotions, and thought processes during the school day, and reaction

¹ The actual pre-post test evaluation results using the survey can be found in the Houston and Jacksonville evaluation reports.

² Although theory does not necessarily seem to guide the research, many researchers in the area cite B. F. Skinner and Albert Bandura in their literature reviews.

to challenge, which refers to a student's coping strategy for dealing with perceived failure in school (Connell & Wellborn, 1994; Skinner, Zimmer-Gembeck, & Connell, 1996). Using the Rochester Assessment Package for Schools (RAPS) instruments, Klem and Connell (2004) found that students who were at optimal levels on their engagement measures were "44% more likely to do well and 23% less likely to do poorly on the performance and attendance" indices. In addition, students who were considered below average in engagement were 30% more likely to do poorly on student outcomes.

Fredricks and colleagues also published a comprehensive article that synthesizes the research in school engagement (Fredricks, Blumenfeld, & Paris, 2004) and put this body of research into a theoretical framework consisting of three types of engagement: behavioral engagement, cognitive engagement and emotional engagement. And while there are arguably overlaps in these concepts³, it appears to be a good way to conceptualize the work and add to the field. The following is a description of each:

1) Behavioral Engagement: Broadly defined as doing school work and following rules.

Examples:

- Positive Conduct: Consists of behaviors that illustrate effort, persistence, concentration, attention, asking questions, contributing to class discussion, following rules, studying, completing homework, and participating in school-related activities.
- Absence of Disruptive Conduct: Not skipping school and not getting in trouble.

³ For instance, a scale item designated as cognitive engagement because it refers to the effort put forth in doing school work might also be considered a behavioral engagement because it reflects behavior rather than thought.

2) Cognitive Engagement: Essentially defined as motivation, effort and strategy use. This includes a psychological investment in learning, a desire to go beyond the requirements and a preference for challenge.

Examples:

- Flexibility in problem solving, preference for hard work, investment in learning beyond just behavioral engagement, mental effort, and desire to master a task.

3) Emotional Engagement: In general, this includes interests, values and emotions.

Examples:

- Affective reactions in the classroom, attitudes towards school and teachers, identification with school, feelings of belonging, appreciation of success in school.
- The antithesis of positive feelings are also emotional engagement items.

The division of engagement is not intended to imply a definitive separation, because as Fredricks et.al. (2004) state, “these factors are dynamically interrelated ... they are not isolated processes” (pg. 61). Instead, the division merely aids in understanding that “engagement” as a whole is a multi-dimensional construct. In fact, the authors discuss numerous overlaps in past research, and the potential for overlaps is evident in the concepts as they define it. Consequently, we would expect these components to be highly correlated with each other, but relate differently to student outcomes such as achievement and attendance.

Fredricks et al. (2004) also discuss the past research in terms of what associations have been found between the types of engagement and achievement. The authors conclude that there is a body of evidence showing the relationship between behavioral engagement and achievement exists but that there may be mediating factors that influence this relationship. In addition, it is

unclear if behavioral engagement is predictive of deep understanding of material. Little convincing evidence has been found concerning a link between emotional engagement and achievement. This, however, may be due in part to inconsistent ways in which researchers have measured what Fredricks et al. conceptualize as emotional engagement. However, evidence of a relationship between cognitive engagement and achievement is much stronger, including data from scores on achievement tests designed to measure in-depth understanding. The work in this field, however, does not eliminate the possibility of a bi-directional influence between outcomes and engagement: it is most likely that they influence each other.

The relationship between engagement and dropping out has been studied somewhat. Not surprisingly, behavioral engagement, which includes measures of skipping class is related to dropping out than the other two engagement types (Connell, Spencer, and Aber, 1994, Rumberger, 1987). There is little empirical evidence that emotional or cognitive engagement is related to dropping out. However, it seems plausible that cognitive engagement is related to achievement. If it is true that students whose academic performance is poor are less engaged, then it is possible they are also more likely to drop out. In addition, students who feel emotionally disengaged may also be less likely to continue their school careers. In general, there simply have not been enough studies using these types of clear engagement distinctions to draw conclusions about the nature of engagement and student outcomes.

Methodology in the Survey Design

We examined multiple survey instruments that concerned attitudes and experiences with school to design the student engagement questionnaire for the OJJDP intensive sites. All potential engagement or similar concept items and scales were identified through various sources, including national surveys, surveys from schools, journal articles, and the Core

Measures book produced by CSAP. The research and evaluation team at CFFC worked collaboratively to select the questions that appeared to be most promising in terms of validity and reliability, and that covered a breadth of content. However, in order to cover the breadth of content, but also keep the instrument at a reasonable length, the original scales were not used in their entirety, which had the potential of reducing their validity. The survey items came from the following data sources:

- ADD Health Survey – The National Longitudinal Study of Adolescent Health
- Core Measures - CSAP
- School Integration Index, based on ADD Health
- Fredricks, Blumenfeld, Friedel, & Paris (2002)
- Pellerin (2000)
- Pemi-Baker School District (2002)
- School Climate Survey – From Data Analysis for Comprehensive Schoolwide Improvement by V. Bernhardt (1998)
- Jenkins (1997) – Based on Hirschi’s social bonding theory

Although these are the primary sources we chose, many of the questions were modified somewhat in wording. These changes were made in order to make the survey consistent in terms of the response scales we chose and/or to make the items more clear to the students. In addition, CFFC added unique questions that seemed pertinent to the project but were not considered school engagement questions. For instance, we added questions about exposure to school drop out, expulsion, and suspension, thoughts of dropping out, experience with school failure, students’ experience as parents, activities while skipping school, victimization experience, attitudes toward their neighborhoods, future aspirations, and parental involvement.

After identifying the items we felt would be most useful, we examined each one for “fit” into one of the three types of engagement: emotional, cognitive, or behavioral, based on the descriptions above. Each team member labeled each item by engagement category. The feedback from each member was analyzed and items with general consensus (with all but potentially one member agreeing that there was a fit) were assigned to be part of one of the three scales.

This process led us to create the following scales:

Emotional Engagement

Sixteen items fit this category.

- 19a When I first walked into my school I thought it was Good....Bad.
- 19c When I first walked into my school I thought it was Friendly....Unfriendly.
- 19d When I first walked into my school I thought it was Clean....Dirty.
- 22c I am happy to be at my school.
- 22d The teachers at my school treat students fairly.
- 22f I like most of my teachers at school.
- 22m The discipline at my school is fair.
- 22o Most of my teachers care about how I’m doing.
- 22p Most of my teachers know the subject matter well.
- 22r There is an adult at school that I can talk to about my problems.
- 22s I respect most of my teachers.
- 22v Most of my teachers understand me.
- 23d I feel excited by the work in school.
- 23f My classroom is a fun place to be.
- 23u I enjoy the work I do in class
- 23w I feel I can go to my teachers with the things that I need to talk about.

Cognitive Engagement

Twenty-two items fit this category.

- 21a How important do you think an education is?
- 21b How important do you think it is to get good grades?
- 21c How important do you think the things you are learning in school are going to be to you later in life?
- 21f How important do you think it is to have a good job or career after finishing school?
- 22h I am getting a good education at my school.
- 22j I will graduate from high school.
- 22k I want to go to college
- 22n Most of my classes are boring.
- 22p Most of my teachers know the subject matter well.

- 22q I learn a lot from my classes.
- 23e I am interested in the work I get to do in my classes.
- 23g When I read a book, I ask myself questions to make sure I understand what it is about.
- 23h I study at home even when I don't have a test.
- 23j I talk with people outside of school about what I am learning in class.
- 23k I check my schoolwork for mistakes.
- 23l If I don't know what a word means when I am reading, I do something to figure it out, like look it up in the dictionary or ask someone.
- 23n If I don't understand what I read, I go back and read it over again.
- 23p I try my best at school.
- 23r I get good grades in school.

Behavioral Engagement

Seven items fit this category

- 14 How often have you thought of dropping out?
- 23a When I am in class, I just pretend I am working.
- 23b I follow the rules at school.
- 23c I get in trouble at school.
- 23q I skip (cut) classes during school.
- 23s I skip (cut) the entire school day.
- 23t I try to stay home from school.

We received achievement and attendance information from the Gulfton neighborhood in Houston, TX, Kent County in Seattle, Washington, and Jacksonville, Florida. These data were correlated with the engagement scales to examine validity. We expect that if school engagement is related to achievement and attendance, the scales should be correlated to these indicators. In addition, we would expect that cognitive engagement would be more highly correlated with achievement than attendance, whereas behavioral and emotional engagement might be more highly correlated with attendance than achievement. However, since we believe that engagement is a single concept with multi-dimensions, we expect that each type of engagement would be related to student outcomes as well as to each other. In addition, we ran Cronbach Alphas on each scale in each site to examine scale reliability⁴.

⁴ Cronbach's Alpha is an index of reliability for a set of items that indicates the extent to which items measure the same characteristic. Also known as the indicator for scale internal consistency and as scale reliability coefficient.

Results

Reliability

A “reliable” instrument is one that produces the same measurement if used repeatedly with the same population. Each of the scales is clearly reliable. The typical acceptable Cronbach Alpha in social sciences is .70. Each of the scales, with the exception of behavioral engagement in Jacksonville, Florida exceeds this, and does so consistently. It is true that by adding items to a scale one can expect Cronbach Alphas to be higher (assuming the items are at least somewhat related to the construct of measure). Thus, the lower Cronbach Alphas in the behavioral scale may be due in part to the relatively few items (7) in this scale compared to the other two (16 in the emotional and 22 in the cognitive scales). See the tables below for details.

Emotional Engagement

Location	Sample Size	Cronbach’s alpha
Houston	57	.884
Jacksonville	39	.895
Seattle	39	.902

*Listwise deletion based on all variables in the procedure.

Cognitive Engagement

Location	Sample Size	Cronbach's alpha
Houston	66	.904
Jacksonville	41	.922
Seattle	43	.867

*Listwise deletion based on all variables in the procedure. Note: If the item "Most of my teachers know the subject matter well." were deleted in Houston, the alpha be .901.

Behavioral Engagement

Location	Sample Size	Chronbach's alpha
Houston	72	.797
Jacksonville	46	.489
Seattle	47	.793

*Listwise deletion based on all variables in the procedure.

Validity

An instrument is considered valid when it measures what it is supposed to measure. There are a number of ways to assess validity. We chose convergent validity, in which constructs that are similar to the instrument are identified, valid data sources for those constructs are gathered and the relationship between the instrument and the already established valid data is assessed. We attempted to examine whether the scales were related to other school outcomes (such as GPA and attendance) in order to assess the validity of the engagement scales. These results are broken out by site.

Houston

In Houston, the emotional engagement scale was not significantly correlated with GPA, but the cognitive scale correlated with GPA. The coefficient was .369, which is significant at the $p < .005$ level ($N = 62$). This means the cognitive engagement scale accounts for approximately 14% of the variance in GPA. The behavioral scale also correlated with GPA .345, which is significant at the $p < .005$ level ($N = 68$). This means the behavioral engagement scale accounts for approximately 12% of the variance in GPA. There were no significant correlations between attendance and cognitive or emotional engagement, however, the correlation between behavioral engagement and days missed was .20 ($p = .15$, ns). Finally, the emotional scale correlated with the behavioral scale .22 (ns) and correlated with the cognitive scale .68, $p < .001$. The behavioral scale is correlated with cognitive scale .52, $p < .001$.

Seattle

In Seattle, none of the engagement scales correlated with GPA or absences. Behavioral engagement correlated with cognitive engagement, $r(51) = .64$, $p < .001$ and with emotional engagement, $r(51) = .35$, $p < .05$. Emotional engagement correlated with cognitive engagement, $r(51) = .72$, $p < .001$.

Jacksonville

Since the students served in Jacksonville are primarily in elementary schools, we received Math and English grades rather than GPA. We also received attendance information broken down for excused and unexcused absences.

The behavioral scale did not correlate significantly with grades, but was correlated with unexcused absences, $r(40) = .352, p < .05$. The emotional scale was significantly correlated with Math grades, $r(32) = .48, p < .01$, English grades, $r(32) = .43, p < .05$, and unexcused absences, $r(33) = .61, p < .001$. The cognitive scale was also significantly correlated with Math grades, $r(34) = .40, p < .05$, English grades, $r(34) = .37, p < .05$, and unexcused absences, $r(35) = .46, p < .01$. None of engagement scales correlated with excused absences.

The emotional and cognitive scales were significantly and highly correlated; $r(37) = .928, p < .001$, where as the behavioral scale was not significantly correlated with the cognitive scale and was only marginally correlated with the emotional scale; $r(30) = .31, p = .05$.

Conclusions

The school engagement survey was designed to measure school engagement as a whole. In this project it was tested with small samples of truant students. Consequently, the participants in this study are likely to be less engaged than students as a whole, and to have a restricted range of achievement and attendance indicators than that which would be found in an entire student body. This complicates testing for validity and reliability. Nevertheless, we found support for the reliability of the engagement scales and some support for the validity.

The scales met and exceeded the desired criterion for reliability; in all but one case, the Cronbach Alphas ranged from .79 to .92. Cronbach Alphas can range from 0 to 1. The higher the number, the more likely the items in the scale are measuring a similar concept. These numbers indicate that the items “fit” in these scales.

The scales also appear to be valid as evidenced in two of the three sites. In Houston, cognitive and behavioral engagement was significantly related to GPA. Behavioral engagement was correlated with attendance, but not significantly so. In Jacksonville, all the scales were

significantly related to unexcused but not excused absences. In addition, emotional and cognitive engagement were also related to Math and English grades. Although similar findings were not found in Seattle, these findings do suggest that engagement is likely to predict and/or be predicted by attendance and achievement.

Behavioral engagement is more closely related to attendance than grades, which is not surprising given that some of the items are self-reports on missing classes. Jacksonville's data included excused absences, which were not related to any of the engagement indices. If we believe that excused absences are legitimate (e.g., illnesses) and therefore not related to student engagement, we would expect no relationship to exist. Consequently, this is perhaps a good illustration of "discriminant validity" in which a construct unrelated to engagement, like excused absences, would not be expected to be related to engagement. Nevertheless, the lower reliability indices for this scale indicates that the next steps should be to add items to improve reliability and perhaps broaden the construct in terms of other school related behaviors.

In addition, the cognitive engagement scale was more consistently correlated with achievement than the other two types of engagement. This makes conceptual sense. One would expect that students who report putting more effort into school work would achieve higher grades.

All of the scales are correlated with each other. This too, makes conceptual sense because as stated earlier, engagement is conceived to be a multi-dimensional, but unified, construct. The fact that these correlations ranged from not significant to .93 show that although they are related, they are not measuring identical concepts within engagement.

These results indicate that a school engagement questionnaire can be a useful tool in assessing cognitive, behavioral and emotional engagement as well as providing some indication of how students may be doing in terms of attending school and achievement. However, there is much more research to be done before the school engagement instrument designed for this study can be definitively said to be the best tool to use. Additional work, some of which has already been done, includes qualitative research with students (focus groups about engagement and one-on-one cognitive interviews about the survey items), and gathering schoolwide and hopefully districtwide engagement and student outcome data in multiple states.

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The National Center for School Engagement (NCSE) is an initiative of The Colorado Foundation for Families and Children (CFFC). NCSE strives to build a network of key stakeholders who share the belief that improving school attendance and school attachment promotes achievement and school success.



National Center for School Engagement

NCSE was established as a result of more than a decade of educational research about youth out of the educational mainstream conducted by CFFC. The impact of this work has been the development of significant investments of state funds to reduce suspensions expulsions and truancy. Over five years ago, CFFC began working with the OJJDP, US Department of Justice to assist in the planning and implementation of pilot demonstration projects across the country. As projects developed, CFFC became the national evaluator of this five-year truancy demonstration project.

The culmination of ten years of program experience and research has identified truancy and school engagement as the centerpiece of NCSE's work to improve outcomes for youth who are at the greatest risk of school failure and delinquency. We are national leaders in applying research to help communities prevent and reduce truancy.

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