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12. NON-COGNITIVE ASSESSMENT AND STUDENT ENGAGEMENT

The views expressed in this chapter are those of the authors and not necessarily their employing organizations.

BACKGROUND: BALANCING NON-COGNITIVE FACTORS IN EDUCATIONAL SETTINGS

For many decades education systems were focused on accounting for cognitive components of student educational attainment, and summative standardized tests emerged as important ways of measuring academic outcomes. The evolving 21st century societal and associated education systems are distinguished by increased complexity and dynamism of all their major elements, including intertwined multi-cultural and demographic realms, family structures and ever changing domestic and world economies, which consistently confront society and education with evolving demands and challenges. Besides the pressure to meet challenging education standards in the time when college readiness becomes a norm, school students face other daily issues associated with peer pressures, uses of technology and mass media, unhealthy relationships (including bullying), struggling with sexual and gender identity, substance abuse, etc. Additionally, growing proportions of immigrant and minority students may face challenges of cultural and language adjustments, fitting in with their peers, meeting academic demands and other issues.

Research demonstrates that various non-academic factors can be very impactful in student behaviors and academic outcomes. For example, in the meta-analysis of 213 school-based universal social and emotional learning (SEL) programs, Durlak, Weissberg, Dymnicki, Taylor and Schellinger (2011) demonstrated significant gain in student academic achievement. Consequently, school staff face the necessity of delving into a broad array of non-academic, social, emotional and other realms, in order to create school climates that are equitable, safe, inclusive and socially and academically stimulating for diverse student populations.

Increased complexity of evolving contemporary education systems compel more comprehensive approaches to balancing and measuring system aspects that span beyond traditionally considered cognitive educational components into an intricate domain of "non-cognitive" factors, which are conceptualized in diverse ways. These non-cognitive concepts, which often relate to each other, include "positive personal

M. S. Khine & S. Areepattamannil (Eds.), Non-cognitive Skills and Factors in Educational Attainment, 265–292.

qualities other than cognitive ability" (Willingham, 1985; quoted in Duckworth & Yeager, 2015, p. 239), (e.g., self-control, emotional intelligence, resilience, confidence, etc.), as well as beliefs, values, attitudes and affect.

Currently there is no consensual terminology in the research and educational community on what constitute non-cognitive factors (Duckworth & Yeager, 2015). While a consensual terminology would be beneficial, in actuality different research and practical contexts, concerns, priorities and goals dictate different understandings and definitions. We also acknowledge Duckworth and Yeager's observation that in many instances it would not be easy to completely conceptually separate cognitive and non-cognitive domains, since "every facet of psychological functioning, from perception to personality, is inherently 'cognitive' insofar as processing of information is involved" (Duckworth & Yeager, 2015, p. 238). Therefore, for the purposes of the research and associated practical applications featured in this chapter, we broadly define non-cognitive factors as acquirable personal qualities, attitudes and beliefs other than *academic* cognitive abilities.

In this chapter we examine how non-cognitive concepts and associated measures and assessments can be implemented in school contexts through addressing a common area of concern among educators – student engagement. Student engagement is often seen as a precursor to academic success, including high school completion (Hazel, Vazirabadi, Albanes, & Gallagher, 2014; Reschly & Christenson, 2012). Student engagement at school (social, affective and academic) is also a prerequisite for equitable educational opportunities for all students. While students from traditionally disadvantaged backgrounds may be at a high risk of disengagement, socially and emotionally disadvantaged and disengaged students can come from a much broader milieu. Where student engagement fails due to various reasons, opportunity for education equity declines.

Systematic attention to the social and emotional issues surrounding education can contribute to the paradigmatic shift towards reframing schools in ways that are more inclusive. Although educators cannot directly influence students' socio-economic status and family dynamics, school contexts can effectively counteract adverse factors in students' lives. Renshaw and Eklund (2015), for example, demonstrated based on a sample of 902 California public high schools, that the moderation effect of positive school climate perceptions on self-reported GPA was strongest for homeless youth and youth from one-parent homes, suggesting a protective effect of school climate. Finn and Zimmer (2013) call for a universal approach to student engagement and suggest that, "…efforts to prevent disengagement should be targeted toward the elementary and middle grades as well as high school" (p. 124).

The Programme for International Student Assessment (PISA) results indicate that drive, motivation and confidence in oneself are essential if students are to fulfill their potential (Organization for Economic Cooperation and Development [OECD], 2014). Focusing on student engagement (including nurturing a sense of belonging, relevance and fairness) is one of the key avenues for educators and educational leaders to change the social and cultural context of education through developing

relationships and caring environments to ensure better academic and social outcomes for all students.

The available engagement models identify various engagement domains, including observable engagement (academic and behavioral engagement) and internal engagement (emotional and affective engagement, belonging and aspirations) (Hazel et al., 2014). Measuring and systematically monitoring both observable and internal types of engagement are equally important. However, while many aspects of observable engagement have been traditionally captured in schools by monitoring attendance, discipline, academic interest and classroom participation, internal engagement, especially of affective and emotional type, often remains unaccounted for, unnoticed or misinterpreted. Since internal engagement is conceptualized as an underlying facilitator of observable, end state engagement, it is important to measure and monitor these facilitative processes to help prevent observable alienation early and suggest targeted interventions that address identified student needs (Burger, Nadirova, & Keefer, 2012).

Non-cognitive assessment that captures internal, facilitative engagement factors is key for the "operationalization" of strategies and interventions directed at increased student engagement and should become an integral constituent of evidence-based decision-making in schools and school districts. "Teachers and school principals need to be able to identify students who show signs of lack of engagement with school and work with them individually before disengagement takes firm root" (OECD, 2014, p. 22). Practice-wise, non-cognitive assessments can be valuable diagnostic tools for detecting general disengagement "symptoms" or patterns and then work *individually* with potentially at risk students to deconstruct these patterns and delve into the diverse root causes. Individual non-cognitive student assessment outcomes also can be aggregated by various student groups (e.g., classrooms, grades and schools) and linked to various academic achievement results to identify general trends and gaps and chart improvement goals and strategies. As Duckworth and Yeager (2015) observed, by applying non-cognitive measurement, one can measure, with precision and accuracy, the many positive personal qualities other than cognitive ability that contribute to student well-being and achievement. "…Self-report questionnaires are arguably better suited than any other measure for assessing internal psychological states, like feelings of belonging" (p. 240).

STUDENT ORIENTATION TO SCHOOL QUESTIONNAIRE (SOS-Q)

In the following sections we demonstrate how non-cognitive assessment can be incorporated in routine school practices as well as support ongoing research by featuring recent research and practical activities around a non-cognitive assessment instrument – the Student Orientation to School Questionnaire (SOS-Q), which formed the operational base for several action research projects in Rocky View School Division (Alberta, Canada). The SOS-Q has been carefully validated and meets the necessities of classroom practical contexts, including reasonably short length (which

does not jeopardize the instrument's comprehensiveness), time requirements from students and teachers and clear language. The underlying premise of this student-centered instrument, which was developed by educational researchers collaboratively with educators and students, is that students are engaged in school when they feel that they belong, can succeed and find it meaningful (Board on Children, Youth and Families [BOCYF], 2003). The SOS-Q targets identifying at risk students in upper-elementary and high school grades and assisting with interventions based on distinct student profiles (Nadirova, Burger, Clarke, & Mykula, 2007).

The junior-senior high SOS-Q version consists of 55 items and the following seven constructs:

1. Safe and Caring School – student perception of how supportive the school environment is;
2. Peers – perceived ability to get along with other students and friends' supports;
3. External Resilience – ability to cope with external challenges and adversities;
4. Internal Resilience – ability to resist anxiety and maintain emotional balance;
5. Self-Confidence – conviction of capability to be successful at school and beyond;
6. Utility of School – perceived usefulness of school;
7. Extracurricular Activities – participation and perceived value.

In addition, the junior-senior high version of the SOS-Q provides an option of collecting self-reported information on students' experience of balancing school studies with employment outside of school. The upper-elementary version of the instrument is less extensive (42 items) and incorporates only the first five constructs. Detailed information on the SOS-Q instrument, including item composition, is available in Burger and Nadirova (2014).

The diagnostic potential of the SOS-Q instrument (e.g., identification of distinct student groups characterized by notable variations in their orientation to school) has been demonstrated using various student samples incorporating different grades. Internal measurement properties (factor structure and reliability) were tested in past studies involving four pilots. Burger et al. (2012), for example, confirmed factor structure of the instrument in a past study based on a large sample of 1,356 grade 7 and 9 students using exploratory and confirmatory factor analysis. Scores on all SOS-Q subscales measuring the seven SOS constructs had acceptable internal consistency: Cronbach's α on five subscales were in the 0.84–0.94 range, and Cronbach's α for the two remaining subscales were 0.72 and 0.75.

CONCEPTUAL COMPOSITION OF THE SOS-Q

This section provides brief highlights of the conceptual constructs corresponding to the SOS-Q measurement subscales. For more detailed discussion of the constructs, underlying concepts and their interrelationships see Nadirova and Burger, 2014 or refer to Burger et al., 2012 for the discussion of the conceptual links to a broader

context of the psychological notions of competence, autonomy and relatedness (Connell & Wellborn, 1991).

Safe and Caring School

The SOS-Q intends to capture the degree of students' identification with the social aspects of school, the sense of belonging, and self-appraised fit in school environment, including feeling safe, understood, heard, and supported. The SOS-Q Safe and Caring School construct reflects students' perceptions of safety and responsiveness of school environments to their needs in a general caring sense as well as socialization with teachers around the notions of communication, respect, fairness and understanding. Since "for many youngsters, the primary adult they speak to during the week is a teacher" (Schargel, 2004, p. 22), the relationship with teachers and other adults in school is of primary importance. Croninger and Lee (2001) contend that teachers provide an especially important source of social capital for students in considering whether to stay in school.

Relationship with Peers

Peers play a central role in schools' social milieus and for adolescents the relationship with friends often becomes more important than relationships with family (Hair, Jager, & Garrett, 2001; Newmann, 1992). Therefore, including the peer-related measure in a non-cognitive assessment targeting student engagement is imperative to capture emotional connection to school. The SOS-Q focuses on two major facets of peer relationship: ability to get along with other students in general and experiencing friends' support in particular.

External and Internal Resilience

The SOS-Q incorporates various aspects of resilience. School social contexts, including caring relationships and opportunity to participate and contribute are among key protective environmental factors positively influencing student resilience (Benard, 2000; Richardson, 2008; Stewart, Sun, Patterson, Lemerle, & Hardie, 2004). Resilience is a key personal strength that enables a young person to navigate the environmental risks and become happier, more successful, and more balanced in life. Resilience is defined as "the phenomenon of overcoming stress or adversity" (Rutter, 1999, p. 119), "a dynamic process encompassing positive adaptation within the context of significant adversity" (Luthar, Cicchetti, & Becker, 2000, p. 543), and the ability to persevere and adapt when things go awry (Reivich & Shatté, 2003). "It refers to the characteristics of children that allow them to thrive despite exposure to adversity and deficiencies in the settings of their daily lives" (Stewart et al., 2004, p. 26). In line with these conceptualizations, the SOS-Q relates resilience

to the way students respond mentally, emotionally, and behaviorally to (adverse) situations and events. Following several developmental and piloting iterations, two resilience constructs were built in the SOS-Q to distinguish between internal and external resilience. Internal resilience conveys the ability to withstand anxiety and sustain internal emotional and mental balance while external resilience focuses on the ability to recover quickly from external disruptive changes or hardships without being overwhelmed or acting in dysfunctional ways, as well as the ability to cope and adapt successfully in the face of challenges, risk, or adversity (Burger & Nadirova, 2014). Resilience is an intrinsic human capacity to transform that can be facilitated and developed, including building associated personal strengths, social competence, a sense of autonomy, identity and purpose, and belief in a bright future (Benard, 2000).

Self-Confidence

Students' general positive beliefs about their skills, competencies, and ability to succeed constitute self-confidence. SOS-Q defines self-confidence as students' conviction that they are capable and well positioned to be successful at school and beyond (Burger & Nadirova, 2014). We theorized that students' assurance about their capability to be successful at school and in life in general plays an important role in fitting well in school, feeling adjusted, motivated and bonded to school. It is important to distinguish between a general construct of self-confidence incorporated in the SOS-Q and the related concept of self-efficacy, which, unlike a broader concept of self-confidence is domain, task or situation-specific (Druckman & Bjork, 1994; Pajares, 1996). Bandura (1977, 1986) refers to self-efficacy as people's judgments of their capabilities to accomplish specific tasks or activities successfully (e.g., various academic tasks). Thus, self-efficacy can be conceptualized as "situationally specific self-confidence" (Druckman & Bjork, 1994, p. 174). It follows that the concepts of self-confidence and self-efficacy can be causally interrelated. Since the purpose of the SOS-Q is to make the instrument applicable to all students and a broad range of situations, it focuses on defining and measuring self-confidence as a general construct. The SOS-Q conceptualizes self-confidence as a dynamic, developmental feature rather than an immutable attribute, meaning that self-confidence can be developed, stimulated, and built up through teachers' and school staff actions to generate and support positive student experiences.

Utility of School

The junior-senior high school version of the SOS-Q incorporates the concept of Utility of School, as perceived by students. Closely formulated is the concept of aspirations, which "are students' interest and investment in their education, based on their appraisals of the worthwhileness of an education and its utility to their future" (Hazel et al., 2014, p. 807). "The perceived utility of school and particular

courses may be important in sustaining students' participation in school—sometimes despite frustration and failure" (Finn & Zimmer, 2012, p. 113). Unlike specifically conceived studies focusing on particular school subjects or student career aspirations, the SOS-Q captures a general sense of usefulness of school experience relative to broadly formulated current and future opportunities and outcomes, including helping in later life, helping with career plans, and providing opportunities to learn interesting things. In this respect the SOS-Q Utility of School construct is similar to the conceptual underpinnings of Voelkl's Students' Identification with School scale (Voelkl, 1996). Students scoring high on the SOS-Q Utility of School subscale would tend to see value in deferred gratification, whereby their efforts in school today will be rewarded with anticipated future benefits.

Extracurricular Engagement

Participation in and perceived value of Extracurricular Activities is a conceptual construct that is included in the junior-senior-high version of the SOS-Q, since these activities could offer vital complementary learning (e.g., skill and competency building) along with developing social networks, emotional supports, and positive role modeling. Specific proven benefits from participation in school extracurricular activities and community programs include reduced rates of school failure, early dropout, and problem behaviors (Mahoney, 2000; Mahoney, Larson, Eccles, & Lord, 2005). Since schools may have only limited influence on out-of-school engagements, the SOS-Q refers to predominantly school-based extracurricular activities and offers generally formulated statements that do not feature specific types of activities that may vary from school to school.

ANALYSIS OF THE RELATIONSHIP BETWEEN NON-COGNITIVE FACTORS AND ACADEMIC ACHIEVEMENT

The imperative role of non-cognitive assessments is helping respond to student social and emotional needs to promote student learning. Therefore, the link to educational attainment is of primary interest to educators. While it was shown before (Nadirova & Burger, 2014) that the relationship between orientation to school measured via the SOS-Q and academic outcomes was in the hypothesized direction (students displaying more positive orientation to school performed better), it was not controlled for the important attendant variables.

In this chapter we show the results of a multivariate analysis of the link between student orientation to school and achievement using a recently obtained substantive student sample. Unlike previous research, classroom achievement data generated by teachers were used to examine the above-mentioned relationship to facilitate comparisons with previous results obtained using large-scale standardized tests (which in Alberta are restricted only to grades 3, 6, 9 and 12) (Nadirova & Burger, 2014). Our purpose was to determine whether the effect of student orientation to

school persists in a broader context, after accounting for several other key student-related and socio-economic status (SES) characteristics. Additionally, we examine how patterns in student disposition toward school vary in distinct student groups.

The objectives of the analysis were to:

1. Examine direction and strength of the relationship between student achievement (predicted variable) and SOS-Q constructs (predictors), controlling for the attendant independent variables including students' special needs, English language learning, gender, grade and SES;
2. Investigate differences in the SOS patterns (profiles) in various student groups;
3. Discuss emerging intervention practices applied by schools to improve their student engagement using the SOS-Q evidence.

Data

The data analyses discussed in this section are based on the SOS-Q survey data collected by school administrators in late fall 2013 – early spring 2014 from 1084 grades 7, 8 and 9 students (569 male and 515 female) in eight schools in a Canadian suburban/rural school district. (The survey was administered to all students in respective grades). As well, subsequent sections refer to some upper-elementary SOS-Q data to illustrate the results of practical applications of the SOS-Q in schools.

The items comprising SOS-Q constructs were rated on a 5-point Likert-type scale, with response options ranging from strongly agree to strongly disagree. Additionally, self-reported data on student employment outside of school were collected (hours worked per week).

The results of analyses associated with student achievement data are based on a smaller sub-sample of 924 students (484 male and 440 female) who had matched classroom achievement data available in both English Language Arts (ELA) and Mathematics. Student year-end (2014) classroom achievement data were measured as percentage points (maximum 100%).

Supplementary (control) variables included student gender, special needs, English language learning and 2011 census socio-economic data for individual students based on their residential postal codes (average family income).

Analysis

The relationship between student achievement (predicted variable) and the SOS-Q constructs and other predictor variables was tested using SPSS multiple linear regression model (sequential entry). First, the seven student orientation to school variables (i.e., subscale means computed based on the seven SOS constructs) were entered into the model as predictors of student achievement, then control variables were added to the model.

In addition, the patterns of student orientation to school were compared across distinct student groups. The differences between males and females, older and younger students and "mainstream" majority versus students coded as special needs or English language learners were tested using independent samples t-test and one-way ANOVA.

RESULTS

Student Orientation to School and Academic Achievement

We started the analysis of student orientation to school and academic achievement by examining the differences in classroom achievement among the students, who were classified into four distinct groups (clusters) according to their orientation to school using k-means cluster analysis. Four distinct groups of students emerged as a result of cluster analysis, including:

- "Very Positive" cluster of students who scored consistently one standard deviation above the mean or higher on all seven SOS-Q subscales;
- "High-Medium" cluster of students who scored around the mean score or about 0.5 standard deviation above the mean on most of the SOS-Q subscales;
- "Low-Medium" cluster of students who scored around the mean score or 0.5 standard deviation below the mean score on most of the SOS-Q sub-scales; and
- "Very Negative" cluster of students, who scored one standard deviation below the mean or lower on the SOS-Q subscales.

The graph on Figure 1 depicts classroom achievement results in English Language Arts (ELA) and Mathematics according to the above-described four student clusters. There was evidence of consistent, statistically significant association between student orientation to school and classroom achievement, especially in Mathematics: students from the Very Positive cluster had higher achievement scores than students from the Medium and Very Negative clusters, and students from the Medium clusters scored higher than students from the Very Negative cluster. These results support the proposition that socio-emotional factors may play an important role in student academic outcomes and are in line with others (Finn & Zimmer, 2013) and our previous findings based on different measures of student achievement using large-scale standardized tests (Nadirova & Burger, 2014).

Regression Models

The relationship between the SOS-Q constructs and academic achievement was further tested using a multiple linear regression model, controlling for a number of variables that also were previously found to be associated with student achievement, including student gender, grade, special needs, English language learner, working outside of school and socio-economic background. Results of multiple regression

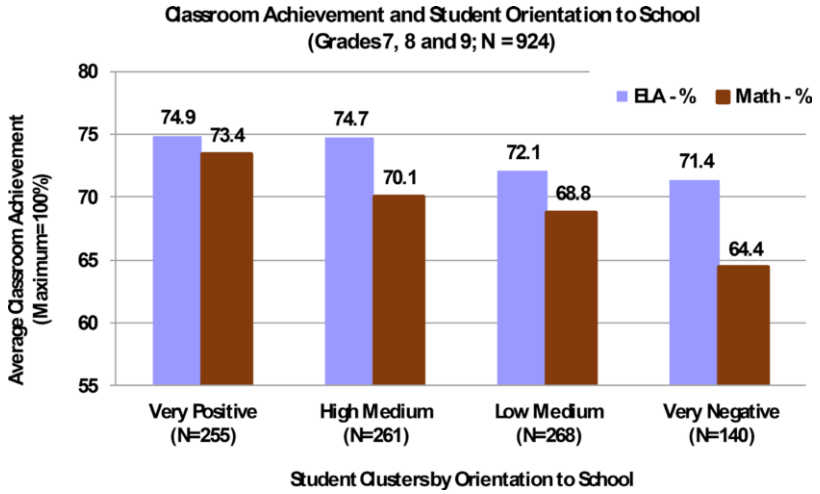

Figure 1. Classroom Achievement and Student Orientation to School (Grades 7, 8 and 9)
One-way ANOVA, ELA: F = 4.987; df = 3, 920; p<.01 (two-tailed); N = 924;
One-way ANOVA, Mathematics: F = 11.068; df = 3, 920; p<.001 (two-tailed); N = 924

analysis presented in Table 1 are based on Mathematics achievement data used as a dependent variable. Incorporation of the socio-economic status (SES) variable – average family income (2011 census data based on individual student postal codes), into the analysis resulted in reduction of available data to 890 cases, because these data were not available for every student. While realizing the limitations of using aggregate geographic proxies as a substitute for individual SES data (including biases associated with data aggregation, misclassification, etc.), we decided to include an aggregate measure of average family income in the analysis given lack of SES data collected from individual students. Family income has been a proven predictor of educational attainment and can modify the association between the SOS-Q variables and student academic achievement when included in the regression model. We intended to find out whether the SOS-Q constructs will hold as predictors of achievement when controlled for average family income. (Furthermore, some possible biases can be reduced. For example, misclassification related to address inaccuracy and assignment of wrong postal codes could be marginal in regularly updated school student data).

The predictor variables were entered into the regression model in several steps to assess the respective effects of each entered group of variables. SOS-Q variables were entered first into the model, starting with Self-Confidence and Extracurricular Activities, since previous research demonstrated that these two variables were the major predictors of academic achievement controlling for other SOS-Q constructs (Nadirova & Burger, 2014), then other SOS-Q predictors were entered into the

Table 1. Regression of academic achievement in mathematics on student orientation to school controlling for student-related and socio-economic variables

SOS variables	*B*	*Standard error*	*Beta*
Self-Confidence	6.508***	1.161	.247
Extracurricular Activities	1.483*	.690	.070
External Resilience	1.597	1.299	.053
Safe and Caring School	1.297	1.092	.050
Internal Resilience	.360	.571	.021
Utility of School	–.834	.930	–.038
Peers	–3.718***	.819	–.156
English Language Learner (ELL = 1; non-ELL = 0)	1.525	2.098	–
Special needs (special needs =1; no special needs = 0)	–7.475***	1.435	–
Gender (female = 1; male = 0)	2.525*	.994	–
Grade (Grade 8 = 1; Grade 7 – reference)	2.712*	1.311	–
Grade (Grade 9 = 1; Grade 7 – reference)	–3.498**	1.101	–
Working Outside of School (working =1; not working = 0)	–3.388*	1.344	–
Average Family Income (thousand)	.037***	.005	.239
Constant	40.318		
R^2	.213		
Adjusted R^2	.201		

Note. N = 890
** p < 0.05; ** p < 0.01; *** p < .001*

model. Altogether the seven SOS-Q constructs accounted for 10% of variance in student achievement in mathematics in the analyzed data sample ($R^2 = 0.098$). Congruently with previous research findings based on different student samples, when accounted for the effects of the other five SOS-Q constructs, Self-Confidence and Extracurricular Activities emerged as statistically significant positive predictors of achievement explaining the bulk of the above-mentioned variance. Emergence of the (relationship with) Peers construct as a third significant, but negative predictor of academic achievement is not totally surprising, given that high school peers may be a source of positive or negative influence in keeping with the observation that, "…research suggests that students with more academically engaged friends perform better academically than those whose friends are disengaged" (Juvonen, Espinoza, & Knifsend, 2013, p. 392). In our previous research based on a different

junior high student sample from a different school district the Peer construct did not emerge as a significant predictor of achievement, but was found to have effect on the External Resilience construct, which, in turn, significantly affected Self-Confidence (Nadirova & Burger, 2014). We can conclude based on the available research findings, that while Self-Confidence emerges as a "stable" predictor of educational attainment, other constructs can be more contextually dependent, including the Peers variable and need further investigation using different data samples.

As demonstrated by a previous explorative study, which involved path analysis (Nadirova & Burger, 2014), some SOS-Q constructs, many of which are inter-correlated, could be associated with student achievement not directly, but through mediated links. For example, while Self-Confidence persistently emerged as the strongest, direct predictor of academic achievement, several other SOS-Q constructs, including External Resilience and Safe and Caring School were found to be positively related to Self-Confidence and thereby, were indirectly associated with student academic achievement.

Table 1 shows the final regression model, after variables on English language learners and special needs students were entered into the model, followed by the variables reflecting student gender, grade, working or not working outside of school and finally, average family income.

The expanded regression model revealed other significant predictors of student achievement, including gender (females were more likely to outperform males), grade (older, grade 9 students more likely to be lower achievers than their grade 7 counterparts), special needs students tending to have significantly lower achievement than those with no special needs, and higher SES (average family income) being positively associated with achievement. Being an English language learner did not indicate a statistically significant difference in achievement. This result may be attributed to a very small proportion of these students in the analyzed sample – between 5 and 6 percent. Surprisingly, working outside of school, which (in moderation) was expected to have a positive effect on achievement, showed a significant negative effect. (The majority of respondents did not work, and those who worked typically did not exceed 5–6 hours a week). A possible explanation of this finding is that junior-high students may be still too young to successfully manage school and work. In all, the above-described attendant independent variables accounted for an additional 11% in classroom achievement variance, for the total of 21% together with the student orientation to school (SOS) variables (total $R^2 = 0.213$).

After accounting for all mentioned associations, Self-Confidence and Extracurricular Activities constructs continued showing significant, positive relationship with academic achievement, Self-Confidence being the strongest predictor. Judged by unstandardized regression coefficient (B), as Self-Confidence score increases by one unit on a 5-unit scale, classroom achievement would increase by 6.5 units on a 100-unit scale or by 6.5%. This may be indicative of a considerable difference in students' academic standing, including the difference between

acceptable and excellent grades or between acceptable and failing grades. While Self-Confidence has been consistently emerging as a strong, positive predictor of academic achievement in different student samples, the magnitude of effects on academic achievement may vary depending on specific student populations and possibly on specific achievement measures.

SOS PATTERNS IN VARIOUS STUDENT GROUPS

Preliminary findings on student orientation to school patterns in different groups of students are charted in Figures 2 through 4, which show differences in the SOS-Q subscale mean scores. Figure 2 depicts gender differences. While according to the multiple regression model (Table 1) females generally were more likely to outperform males in Mathematics, they scored significantly lower than males on the Internal Resilience SOS-Q sub-scale, which is indicative of being less assured about their ability to resist anxiety.

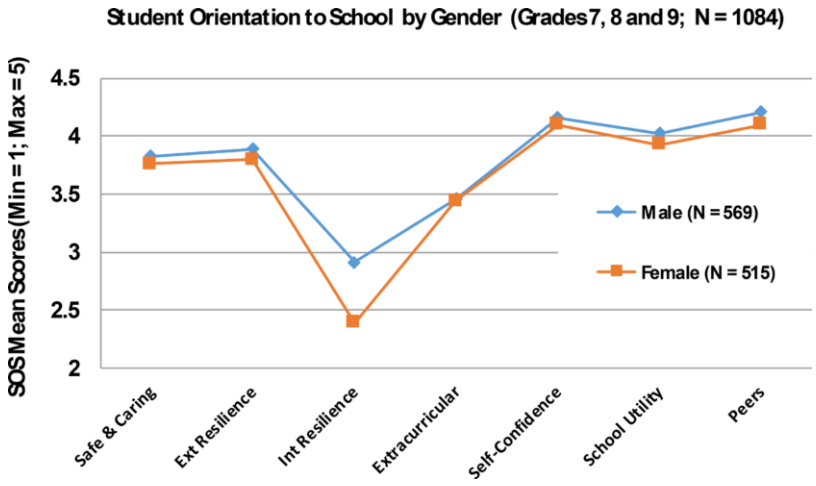

Figure 2. Student orientation to school by gender (Grades 7, 8 and 9) Internal Resilience, independent samples t-test: t = 9.693; df = 1082; p < .001(two-tailed); N = 1084

As illustrated by Figure 3, older, grade 8 and grade 9 students were consistently more negative than younger, grade 7 students on most SOS-Q constructs, including Safe and Caring School, External Resilience, Internal Resilience, Extracurricular Activities, Self-Confidence and (perceived) Utility of School. However, no statistically significant differences were detected in SOS mean scores in (relationship with) Peers.

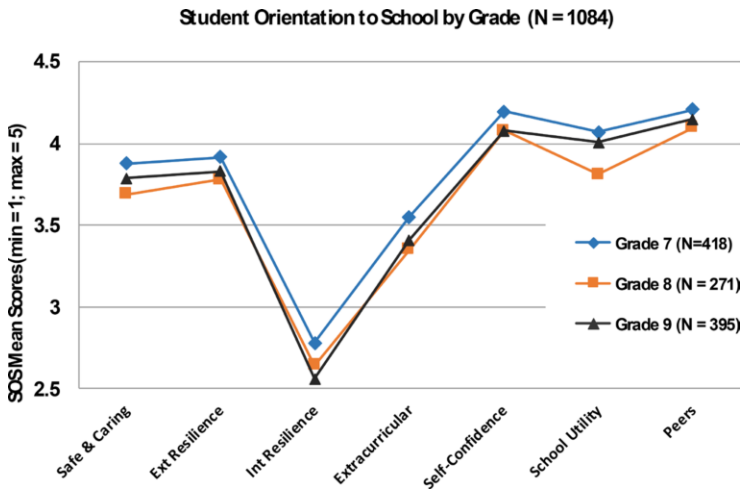

Figure 3. Student orientation to school by grade (Grades 7, 8 and 9) One-way ANOVA (df = 2, 1081; two-tailed; N = 1084): Safe & Caring, F = 8.364, p < .001; External Resilience, F = 6.154, p < .01; Internal Resilience, F = 5.868, p < .01; Extracurricular Activities, F = 6.534, p < .01; Self-Confidence, F = 5.578, p < .01; Utility of School, F = 10.573, p < .001; Peers – n.s

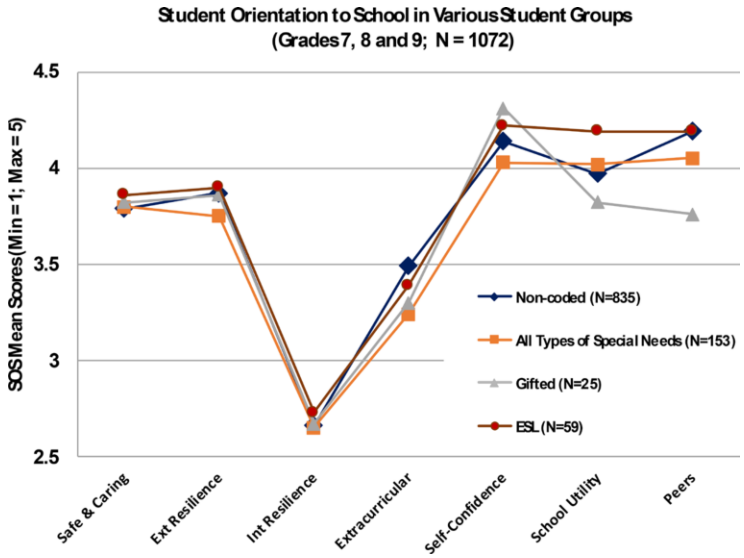

Figure 4. Student orientation to school in various student groups Note: Analyses of means are not reported due to large variations in student numbers in different groups of students

Figure 4 depicts differences in student orientation to school among students with various special needs (severe, mild or moderate), English language learners, gifted students and "mainstream" students with no special codes attributed to them. Students with various special needs were somewhat less affirmative towards school than other groups of students on some of the SOS-Q constructs. On a positive note, they scored very close to the non-coded students on the Safe and Caring School and Internal Resilience constructs.

English language learners were characterized by relatively high appreciation of Utility of School compared to other groups of students. A small group of gifted students revealed an interesting pattern of the highest Self-Confidence (assurance in their abilities and success), but the least positive attitudes toward Peers, Utility of School and Extracurricular Activities. Due to a small number of ELL and gifted students in the current sample, the emerged patterns need further verification and validation based on samples that contain higher proportions of these particular groups of students.

SOS PATTERNS IN VARIOUS SCHOOLS

Figure 5 shows examples of variations in junior high student orientation to school in different schools. Graphed data reveal distinct school-related SOS patterns, with some schools displaying consistently high scores on most SOS-Q constructs (around 4.00) and others having notable variations across the SOS-Q subscale

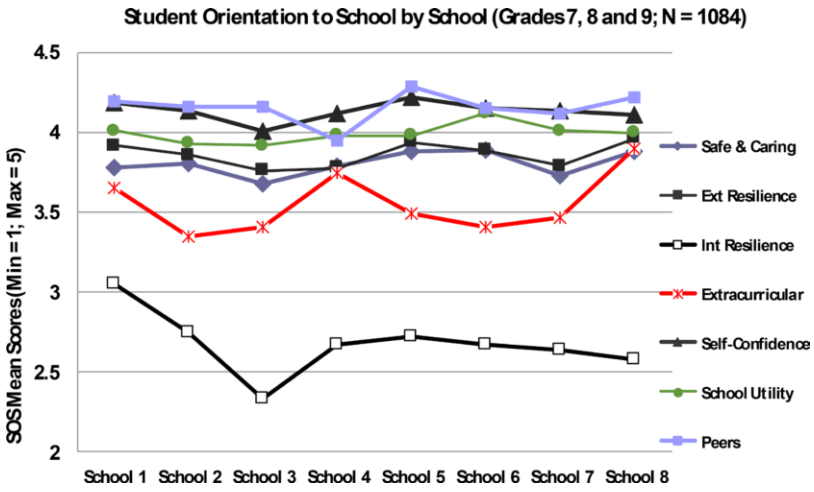

Figure 5. Student orientation to school by school (Grades 7, 8 and 9)
One-way ANOVA (df = 7, 1076; two-tailed; N = 1084): Safe & Caring, F = 2.252, p < .05; External Resilience – n.s.; Internal Resilience, F = 5.530, p < .001; Extracurricular Activities, F = 4.596, p<.001; Self-Confidence – n.s.; Utility of School – n.s.; Peers – n.s

spectrum. Consistent with other SOS-Q samples from different school districts and schools (see, for example, Burger et al., 2012), junior-high students in all schools scored the lowest on the Internal Resilience subscale, but there were significant variations among schools on student Internal Resilience. Student appreciation and participation in Extracurricular Activities is another variable that yielded relatively low and varied scores, indicating that some schools may gain from work on this particular construct, given its positive association with academic achievement. The SOS constructs which had relatively high mean SOS scores at a school level also warrant attention, since there may be substantial variation in different student groups (as demonstrated by classifying students according to Very Positive, Medium and Very Negative clusters). For example, while all schools scored quite high on student Self-Confidence, further increase of this score by targeting specific student groups who display low self-confidence may be a viable step towards positively affecting academic achievement. In all, the variations in SOS-Q patterns across different schools warrant attention, since the reasons for these variations may be attributed to different socio-economic composition, school cultures or other factors or combinations of factors, which would require different strategies directed at student orientation to school.

In summary, multiple linear regression reveals that Self-Confidence and Extracurricular Activities consistently predict student achievement controlling for other SOS-Q constructs and in the presence of key control variables. Further investigation of interrelationships among the SOS-Q variables and various measures of achievement will help identify possible complex mediated effects. Additionally, various student groups as well as schools in general were found to display different SOS patterns. Thus, both association of student orientation to school with academic achievement and the variables affecting student orientation to school need to be examined in order to better understand and facilitate student engagement for school improvement.

The intertwined theoretical and practical aspects of research around the SOS-Q and other non-cognitive assessments have direct significance for understanding student engagement to meet an urgent demand of making schools more educationally and socially inclusive and successful while inviting students to be partners in enhancing the culture of the school and change for improvement (Hargreaves & Shirley, 2009). Academic research related to the SOS-Q seamlessly translates into schools' action research and practice. In the following section we highlight how school administrators and staff have used SOS-Q evidence to support strategies directed at individual student diagnostics and improving student engagement.

PRACTICAL APPLICATIONS IN SCHOOLS

Rocky View Schools implemented use of the SOS-Q in 2010–2012 as a pilot project supported with a small Alberta Healthy School Communities grant. Four schools responded to a call for pilot schools that grew to nine schools based on the

positive experiences of the initial schools with application and usefulness of the SOS-Q data for identifying students at risk of disengagement. An evaluation of the initial 2010–2012 pilot supported the acquisition of a larger Alberta Healthy School Communities grant to scale up implementation of the SOS-Q in the 2013–2015 school years. Eighteen schools administered the SOS-Q in 2013–2014. By the end of the 2014–2015 school year 25 Rocky View Schools have used the SOS-Q within the research context that structures our current use of the instrument, and eight of these schools have used the SOS-Q two or three separate times in order to have trend data.

Different groups of students experience disengagement and inequalities in a variety of unique ways depending on their SES, family circumstances, ability (e.g., special needs or gifted), language, etc. Introducing the SOS-Q into schools' data collections and interpreting unique student profiles helps administrators and teachers grasp and understand the spectrum of different student's realities and associated needs.

Using SOS-Q for Diagnostics and Interventions with Individual Students and Student Cohorts

Table 2 illustrates the data model introduced to analyze and report individual and cohort patterns in student orientation to school for specific SOS-Q constructs as well as the total SOS-Q score. The table shows SOS-Q results on a sample of 23 junior-high students where each row of data presents results for an individual student. The table does not contain student identifiers for a shown sub-sample, but individuals are typically identified to permit personalized follow-up; a design feature built into the early stage of SOS-Q development. This simple analytic method provides a quick visual of the individual and cohort results on the SOS-Q including what areas of student affect are most in need of analysis and attention (column data) and which individuals may be most at risk of disengaging from school and why (data in rows).

Raw score data on each individual student in Table 2 were averaged for each SOS-Q subscale and for a total of all questionnaire items. The average scores were then converted to standard z-scores based on the Canadian national norms for the SOS-Q to indicate how many standard deviations (SD) below or above the national mean the students scored (mean z-score is at zero level). Individual student standard scores where then color coded for each SOS-Q construct and total score. Z-scores below the mean (negative z-scores in Table 2) were color-coded as red (2.0 SD below zero or lower); orange (1.0–1.9 SD below zero); and yellow (0.1–0.9 SD below zero). Z-scores at or above the mean were coded as green (0.0–0.9 SD above zero) and blue (1.0 SD above zero or higher). This analytic method provides a quick visual of the cohort results on the SOS-Q including what areas of student affect are most in need of analysis and attention (column data) and which individuals may be most at risk of disengaging from school (data in rows). Typically we observe approximately 10% of a student cohort showing total SOS-Q scores in the red zone suggesting they may be most at risk of disengagement from school and hence most in need of dialogue on how their experience of school may be made more positive. For

Table 2. Individual and cohort examination of student orientation to school using SOS-Q results

Std	*Safe/ Caring*	*Z*	*Ext. Resil.*	*Z*	*Self-Conf*	*Z*	*Peers*	*Z*	*Int. Resil.*	*Z*	*Extra-Curric Activ.*	*Z*	*Utility Sch.*	*Z*	*Total Avg*	*Avg Z*
1	1.0	–3.9	1.0	–4.6	1.0	–5.1	1.0	–4.9	5.0	2.1	2.5	–1.3	1.0	–4.1	1.5	–5.4
2	2.3	–2.0	1.3	–4.0	1.0	–5.1	1.25	–4.5	1.0	–2.5	2.1	–2.0	1.0	–4.1	1.6	–5.1
3	1.9	–2.6	1.8	–3.2	1.2	–4.8	1.3	–4.5	1.5	–2.0	3.0	–0.3	2.5	–2.1	2.0	–4.3
4	2.2	–2.2	3.36	–0.6	3.5	–1.0	3.6	–0.7	3.5	0.3	3.25	0.2	2.33	–2.4	3.11	–0.9
5	4	0.5	2.91	–1.4	3.83	–0.5	3.2	–1.4	2.5	–0.8	2.75	–0.8	2.83	–1.7	3.15	–0.9
6	3.13	–0.8	3.18	–0.9	2.2	–3.1	3.4	–1.0	4.75	1.8	2.88	–0.5	3	–1.5	3.22	–0.9
7	2.33	–2.0	2.45	–2.2	4.67	0.9	2.8	–2.0	3	–0.3	4.12	1.9	3.33	–1.1	3.24	–0.7
8	3.4	–0.4	4.55	1.4	4.17	0.0	3.6	–0.7	2	–1.4	2.25	–1.7	3	–1.5	3.28	–0.6
9	3.47	–0.3	2.9	–1.4	3.33	–1.3	3.8	–0.4	3.5	0.3	2.5	–1.3	3.83	–0.4	3.33	–0.7
10	3.4	–0.4	3.18	–0.9	3.67	–0.8	3.4	–1.0	3.33	0.1	3.12	0.0	3.5	–0.8	3.37	–0.6
11	3.4	–0.4	3.64	–0.2	3.5	–1.0	3.2	–1.4	3.25	0.0	3	–0.3	4	–0.1	3.43	–0.5
12	3.8	0.2	2.91	–1.4	3.83	–0.5	3	–1.7	3.75	0.6	2.88	–0.5	4.17	0.1	3.48	–0.5
13	4.8	1.7	3.82	0.1	4.67	0.9	4.6	0.9	2.75	–0.5	3.88	1.5	5	1.2	4.22	0.8
14	4.15	0.7	3.82	0.1	4.83	1.1	4.6	0.9	4.75	1.8	4.12	1.9	3.33	–1.1	4.23	0.8
15	4.6	1.4	4.09	0.6	4.67	0.9	4.6	0.9	3.25	0.0	3.38	0.5	5	1.2	4.23	0.8
16	4.86	1.8	4.91	2.0	4.5	0.6	5	1.5	3.33	0.1	2.88	–0.5	5	1.2	4.35	0.9
17	4.73	1.6	4.55	1.4	4.83	1.1	4.75	1.1	3.25	0.0	3	–0.3	5	1.2	4.30	0.9
18	4.8	1.7	4	0.4	5	1.4	4.8	1.2	3	–0.3	3.5	0.7	5	1.2	4.30	0.9
19	4.67	1.5	4.64	1.5	4.67	0.9	4.25	0.3	3.25	0.0	3.88	1.5	5	1.2	4.34	1.0
20	4.53	1.3	4.27	0.9	4.67	0.9	4.6	0.9	3.5	0.3	4.25	2.2	4.67	0.8	4.36	1.0
21	4.4	1.1	4.73	1.7	4.67	0.9	5	1.5	3.75	0.6	3.75	1.2	4.83	1.0	4.45	1.1
22	4.36	1.0	4.36	1.0	4.17	0.0	4.8	1.2	5	2.1	4.75	3.2	4.5	0.5	4.56	1.3
23	4.4	1.1	4.55	1.4	5	1.4	4.4	0.6	4.75	1.8	4.5	2.7	5	1.2	4.66	1.4

example, we interviewed one student who was coded as a gifted student and whose total SOS-Q score was above average but who had red z-scores for Utility of School, Peers and Extra-Curricular Activities. During the conversation the student verified that he found his classes unrelated to his career plans, his peers did not understand him and the extra-curricular activities in the school were for the athletically inclined. The Principal was surprised to learn one of the top academic students in the school was disengaged on three of the SOS-Q constructs.

Further evidence of the value of non-cognitive data was provided by another middle school principal who commented in an email that the availability of SOS-Q data on individual students provides a unique and valuable source of insight when students are referred to the school office for behavioral or academic matters (T. Elbel, personal communication, January 16, 2015). This principal wrote:

> SOS-Q helps provide a platform to structure conversations with parents that go beyond the regular "grades and friendship" conversation. Internal resilience is difficult to measure and observe, SOS-Q results provide this measure to some extent. When we see students in the hallway and classrooms interacting with each other and the adults in the school, SOS-Q provides an internal, perceptual lens to the student. Sometimes these lenses are congruent, other times they bring important incongruent perspectives to the fore.

As illustrated below, educators also may use graphed standardized or unstandardized SOS-Q scores for individual students or student cohorts (e.g., grades) to detect emerging issues and measure progress on interventions.

An elementary K-5 school has focused on their Grade 4 and 5 student responses to the SOS-Q and targeted students who demonstrated varying degrees of disengagement in the latter half of the 2013–2014 school year. The SOS-Q was administered to a cohort of 34 students in April 2014 near the end of the Grade 4 year and again in November 2014 when the students were in Grade 5 to assess the impact of the support strategies that had been applied. Overall class results demonstrated gains (see Figure 6) whereas results for the school district in general (congruent with research literature on student engagement) typically show declines in student engagement from one grade level to the next.

Of 34 students in this cohort 20 demonstrated gains on the SOS-Q and 11 of the 20 had large gains (0.40 – 1.07 standard deviations). Ten demonstrated declines with two students showing large declines (0.76 – 0.83 standard deviations) and four had stable pre-post test results.

The classroom teachers shared their observations to unpack what the pre- and post test results implied relative to their interactions and observations of their students. The following are two examples of specific SOS-Q informed intervention strategies that were applied to two students (Student A and Student B) from the discussed student cohort.

Student A demonstrated a large decline in her pre- and post-test SOS-Q results (see Figure 7 displaying individual SOS-Q results for Student A). In the spring

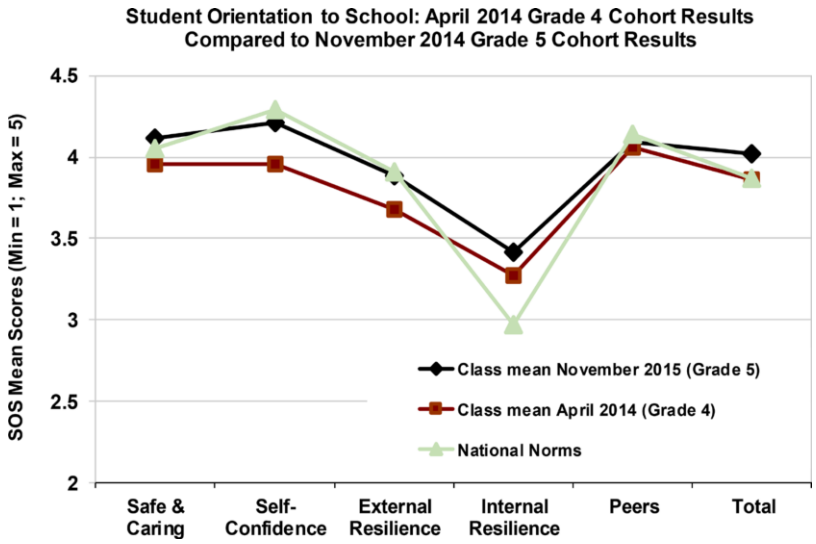

Figure 6. April 2014 Grade 4 Cohort SOS-Q Student Results Compared to Grade 5 Results

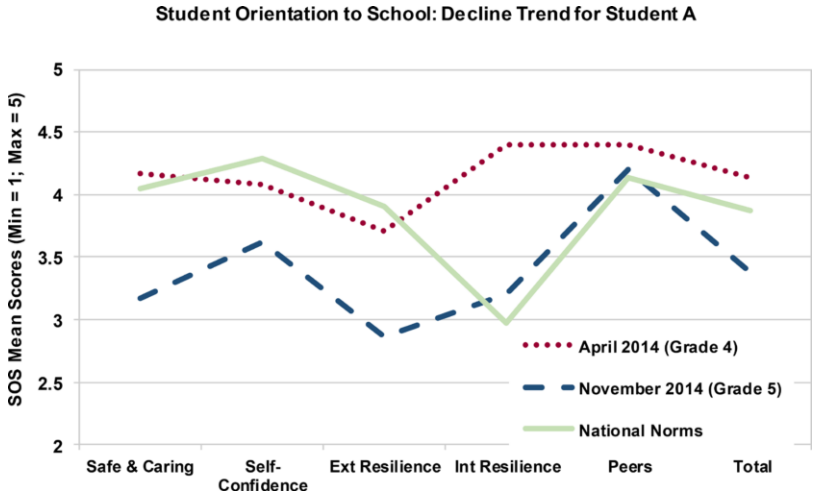

Figure 7. SOS-Q Results on Individual Student A

of 2014 the classroom teachers were concerned that this student was off task too often due to a peer relationship that had gained such prominence that the student was heavily focused on nurturing the friendship at the expense of her academic focus. Consequently the two friends were separated into different class groupings

in the fall of 2014. The November SOS-Q data alerted the teachers to the impact that separating the students was having on multiple orientation to school indicators. The classroom teachers concluded, "These results not only shed light on the lack of resiliency both external and internal and the need for both (students) to develop skills to understand what a healthy relationship is and how to handle the ups and downs of friendship" (Burger, Nadirova, Petit, Stengler, & Valerio, 2015). Follow-up with Student A has included strategies to build resilience, expand peer networks and reinforce the student's self-confidence as a learner.

In another case, Student B demonstrated improving SOS-Q results building on increasingly positive teacher-student relationships (see Figure 8). This student was from a low income family and had overall high SOS-Q results, well above the national norms. The classroom teachers commented, "(Student B) does not complain about her life and meets disappointment in school in a positive way. She gets along well with others, smiling and trying her best in all she undertakes. These traits are reflected in her SOS-Q profile of high resilience and an overall very positive profile" (Burger et al., 2015).

A lead teacher in a Rocky View high school reported using the SOS-Q standardized data to look at areas of student wellness that needed attention. "We used the individual student graphs provided from the SOS-Q data, for each student… to help us identify students with multiple learning and wellness needs… This information also helped us to program for students' learning more effectively, as it was a tool we could use to inform staff about potential needs of students in their classes" (Sly, 2014, p. 57). This teacher observed that the SOS-Q "…provided additional valuable insight into students' needs and gave staff entry points for future

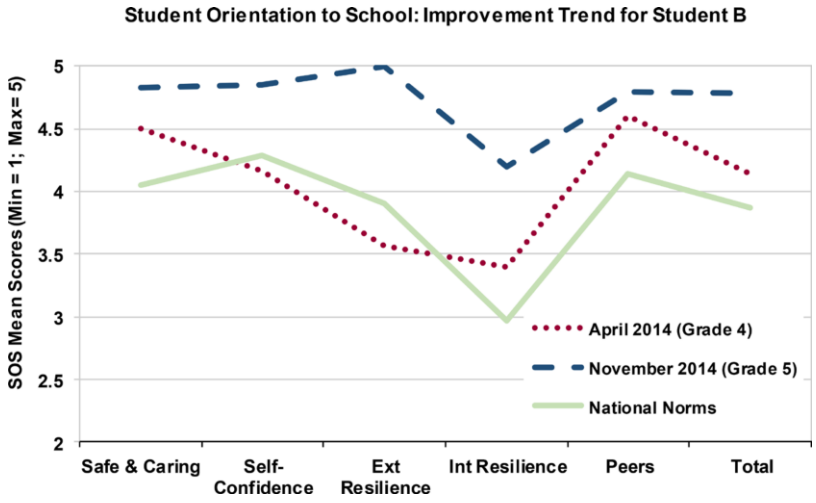

Figure 8. SOS-Q Results on Individual Student B

discussions with students about their success in a given course, as well as overall. In addition, these data helped staff understand how multiple factors can play into students' success and well-being" (p. 58).

The staff in this school used the SOS-Q with strong support from the school administration as a stimulus in building a whole school culture premised on caring and response to students' needs. The lead teacher concluded, "I believe that because teachers, educational assistants, and administrators were all involved in these projects, we maximized our efforts to make as many connections with students for learning, engagement, and wellness as possible" (Sly, 2014, p. 82).

Using SOS-Q for Informing School Intervention Programs

SOS-Q data has had an incredibly strong response among the Rocky View Schools administrators and staff. For example, in response to the pre-post SOS-Q data analysis, the teachers in one of the elementary schools are implementing the GLOW (Girls Leading Others Wisely) program. As commented by these teachers (Petit & Stengler, 2015),

> Our SOS-Q results indicated several areas that would benefit from targeted skill development including peer relationships and resiliency. Our goal is to provide a curriculum-based school program for all grade 5 girls that will develop these skills and promote positive social emotional well-being and strengthen peer relationships thereby contributing to a healthy school community. Being a rural school, our students do not have access to outside agency programs to support the development of these important life skills as our girls transition to the high school.

A French immersion middle school is developing mechanisms to combine SOS-Q data with other gathered information and is developing multiple specialized strategies targeting disengaged students. This school has been using the SOS-Q for 3 years. As reported by the school principal (Ziegler, 2015),

> We have found the (SOS-Q) data useful in identifying our at-risk students. We are currently developing a plan for following up with at risk youth. Specifically, the staff will adapt the Success in Schools (SIS) plan format developed by the Alberta Ministry of Education (http://education.alberta.ca/admin/supportingstudent/collaboration/ppf.aspx) to work with students identified as at risk on the SOS-Q. The advantage of using and adapting the SIS format is:
>
> a. it uses the student's voice to articulate what he/she needs to succeed
> b. it engages parents
> c. it identifies a plan of supports to move forward
> d. the plan can be reviewed after several months or in the following school year to look for progress.

> We will adapt the SIS form to reflect the SOS-Q categories for the plan portion (safe and caring, resiliency, peers etc.), and will then involve the Grade 6 teachers and the school-based Child Development Advisor (CDA) to work with students who appear "in the red zone" on the SOS-Q results. The teachers then will meet with a student in the red zone, and develop the adapted SIS plan based on the SOS-Q data and categories. The teacher, student, parent, administrator and CDA will meet to review and further develop the plan including a follow up date/time to review progress.

A middle school located in a largely blue collar community has used the SOS-Q three times and is accumulating extensive data that they use to support students who appear to be disengaging from school. According to the school principal (Valerio, 2015),

> Our school has established a comprehensive school health and wellness committee that has been in operation for 3 years and consists of teachers, staff, parents and students. This committee advocates for health and wellness initiatives in the school. They also take a lead role in planning and supporting the implementation of programs and activities related to health and wellness. … It is important to support the affective domain of our students…for optimal health and wellness as well as academic performance. We have used many tools to support our work in this area with students and we are expanding this work for further growth and student success.

The principal plans to apply SOS-Q data for evaluating the results of using these tools, including using the Heart Math Emwave software (a bio-feedback program) with many students who need support for self-regulation.

One Rocky View high school has responded with the following observations and planned interventions based on using the SOS-Q (Pepper, 2015).

> Results from the Student Orientation to School Questionnaire (SOS-Q) completed by grade 9s at (our) high school in 2014 indicated that a variety of students were at risk of disengaging from school due to academic and social alienation and a lack of confidence and control. In response to this identified need, one intervention we propose is the development of the Cochrane Healing Arts Time (CHAT) Room. Guided by a caring professional, the CHAT room will lead students experiencing anxiety, physical, sensory, cognitive, speech, learning, social and academic stressors through a process of self-exploration and resolution. This process will help students learn to express themselves (using arts) and ultimately enable them to be more productive and successful within an educational setting.

The above examples provide practical, student-centric responses by school staff to students' SOS-Q profiles that point to risk of disengagement from school. Additional strategies being implemented include enhanced mentoring, and lunch hour student clubs designed to reinforce peer and staff relationships.

DISCUSSION

Nearly 15 years ago Stiggins (2001, pp. 340–341) presented the view that classroom assessment should include measures of student affect and observed that affect and achievement are inseparable concepts within classrooms, and also observed that educators tended to treat measurement of student affect lightly. Yet through four years of piloting the SOS-Q applications, at first in four that grew to 25 schools, we have found keen interest in measuring student affect and other facilitators of student engagement. Measuring student affect is not a silver or magic bullet guaranteed to improve student achievement. In fact, the process involves considerable work and commitment to follow-up obtained results. However, perhaps the interest we have observed in one particular school district is reflective of a growing recognition in the education community of the importance of non-cognitive aspects of school environments and students' experiences in supporting well-rounded student development – academic, social, emotional and personal (Weissberg, Durlak, Domitrovich, & Gullotta, 2015).

The quantitative data analyzed in this chapter have demonstrated the predictive validity of the SOS-Q that extends the previous research we have reported on the construct validity and the relationships with student achievement. Proving positive associations with student educational attainment compels focusing on and accounting for the non-cognitive component in school programming and communication with students and families.

We are accumulating emergent qualitative evidence of non-cognitive assessments informing student's programming and communication needs. We have encountered many instances of teachers and administrators confirming the face validity of SOS-Q results for individual students, often in ways that confirm other means of knowing students through observation and personal communications. Sometimes there are surprises such as the gifted but internally disengaged student mentioned above, or unforeseen support and interest from parents, which could eventually become a vehicle for intensifying parental engagement in school. For example, when a female gifted student told her mother the Assistant Principal discussed her SOS-Q results with her, the mother called the school (before the AP had an opportunity to call the home). After learning the details of the conversation, the mother said, "Finally, someone is getting my daughter."

We can tell stories of students referred to the Truancy Officer for high absences, who were administered the SOS-Q and then the results were reviewed with parents so that a workable support plan could be put into place that addressed issues of weak internal resilience and peer relationships. In another case a middle school student was acting out his frustrations by starting fights with fellow students. The SOS-Q helped open a meaningful dialogue with the father and the student and provided a basis for a plan to positively re-connect the student to the school.

Perhaps the successes being achieved with individual students and the application of appropriate research ethics and protocols helps explain why parent responses

have been so positive, without a single parental complaint about the schools use of the SOS-Q with over 6000 students to date. This growing data base will provide rich opportunities for additional action research on student affect and school engagement.

Development of the SOS-Q program manual (Burger & Nadirova, 2014) with extensive input from teachers, administrators, child development advisors and school psychologists have also been part of the success story conveyed in this chapter. This manual, available on the Rocky View website, is a living document routinely updated to capture new and evolving ideas about strategies to support students who may be disengaging from school.

In addition to the creative student support strategies Rocky View staff are implementing, the successes and challenges of incorporating non-cognitive assessments into the decision-making processes related to student needs holds important implications for the design and implementation of the evolving, district-wide Student Information System, including the importance of developing capacity to link and interpret data. Collection of the SOS-Q data in Rocky View Schools commenced with using paper-and-pencil versions of the instrument, with the questionnaire forms being hand or machine scored. SOS-Q results were randomly verified and a scoring accuracy rate better than 99.9% was confirmed. On-line SOS-Q applications now are being developed with automatic scoring and report generation to scale the SOS-Q to all Rocky View schools in 2016–2017 as part of the Division's strategic Education Plan.

Next steps include working with other school districts to expand the research base underlying the SOS-Q and to perhaps develop other supplemental instruments for use with young students in K-3. We are planning to make the SOS-Q available to schools and school districts outside of Rocky View School Division.

CONCLUSIONS

We began this research with the notion of the emerging need in education communities to recognize and develop student attributes other than cognitive ability. We also put forward the proposition that equitable educational opportunities for all students and inclusive school cultures are premised on high student engagement, which incorporates many non-cognitive concepts, such as self-confidence, resilience, aspirations and others. We agree with the contention that, "…engagement not only drives learning but also predicts school success" (Reschly & Christenson, 2012, p. 4), and also supported it with the results of data analyses. We also emphasized the importance of capturing the key internal, not observable aspects of student engagement, which can be done through incorporating non-cognitive assessments as an integral part of systematically collected school and school district data. We have presented data from participating schools that demonstrated important links between aspects of student orientation to school (SOS), such as self-confidence and extra-curricular constructs that hold significant predictive validity with student academic achievement. These results reinforce the conclusion that, "…students can

accurately report on their school experiences, and in fact, their reports are likely more accurate, or at a minimum an important addition to, the information obtained from other sources…." (Reschly & Christenson, 2012, p. 13). Additionally, we have shared practical experience that demonstrates how distinct student orientation to school patterns emerging in various student groups and in individual students are being detected and used to build more caring and inclusive school communities.

Introducing non-cognitive assessments into evidence-based decision-making and as predictors of school improvement outcomes, including enhanced achievement and high school completion, argue strongly for including non-cognitive measures in schools data compendiums and as components of strategic planning in schools and school systems. Duckworth and Yeager (2015) in their analysis of non-cognitive measurement conclude, "Given the advantages, limitations and medium-term potential of such measures, our hope is that the broader educational community proceeds forward with both alacrity and caution, and with equal parts optimism and humility" p. 246). We agree and contend that it is time to shift the emphasis to action research to support implementation of non-cognitive measures as core data to inform how teachers and administrators can better support students' affective experience of and connection to school.

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