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Understanding and Measuring Student Engagement in School: The Results of an International Study From 12 Countries

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The Hong Kong subproject was supported by the Quality Education Fund of the Education Bureau in Hong Kong whereas the Portuguese subproject was supported by the Portuguese Foundation for Science and Technology and by the Institute of Education of the University of Lisbon. The data of this paper were part of the data collected in a multicountry project initiated by the International School Psychology Association. The authors have previously collaborated to publish an article on gender differences of student engagement (Lam et al., 2012). The two articles have distinctly different themes and include different analyses of different variables. Thus, while some of the description of methods may overlap, each article and related analyses makes a unique contribution to school psychology. Karen C. Stoiber was the Associate Editor for this article.

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The objective of the present study was to develop a scale that is appropriate for use internationally to measure affective, behavioral, and cognitive dimensions of student engagement. Psychometric properties of this scale were examined with data of 3,420 students (7th, 8th, and 9th grade) from 12 countries (Austria, Canada, China, Cyprus, Estonia, Greece, Malta, Portugal, Romania, South Korea, the United Kingdom, and the United States). The intraclass correlation of the full-scale scores of student engagement between countries revealed that it was appropriate to aggregate the data from the 12 countries for further analyses. Coefficient alphas revealed good internal consistency. Test–retest reliability coefficients were also acceptable. Confirmatory factor analyses indicated that the data fit well to a second-order model with affective, behavioral, and cognitive engagement as the first-order factors and student engagement as the second-order factor. The results support the use of this scale to measure student engagement as a metaconstruct. Furthermore, the significant correlations of the scale with instructional practices, teacher support, peer support, parent support, emotions, academic performance, and school conduct indicated good concurrent validity of the scale. Considerations and implications regarding the international use of this student engagement in school measure are discussed.

Keywords: student engagement, measurement, contextual factors, academic performance, student conduct

The concept of student engagement in school has been attracting growing attention from researchers and educators in the past two decades because many studies have revealed that it has high predictive power for a wide variety of developmental and educational outcomes (Appleton, Christenson, & Furlong, 2008; Fredricks, Blumenfeld, & Paris, 2004; Shernoff & Schmidt, 2008). For instance, studies have shown that students who have high levels of student engagement have better grades and conduct at school, as well as higher levels of self-esteem and socially appropriate behaviors (Connell, Spencer, & Aber, 1994; Finn & Rock, 1997; Maddox & Prinz, 2003; Voelkl, 1997).

Despite increasing interest in student engagement in countries around the world, there is no clear understanding of the construct. Indeed, there has been much confusion regarding its definition and measurement. In an effort to overcome these problems and to also advance knowledge and understanding related to student engagement in school around the world, an international project was initiated to clarify the concept of student engagement and to develop a measurement tool appropriate for use in countries around the world. The aim of the current study was to examine the psychometric properties of this tool and explore its suitability in different countries.

Conceptual and Measurement Issues of Student Engagement

To measure student engagement, the first step is to have a clear understanding of its definition and constituents. Skinner, Furrer, Marchand, and Kindermann (2008) pointed out that there are at least two important areas of confusion in the conceptualization of student engagement. One centers on the number and nature of dimensions within student engagement and the other focuses on the distinction between indicators versus facilitators of student engagement.

Most contemporary researchers have agreed that student engagement is a metaconstruct encompassing multiple dimensions of involvement in school or commitment to learning (Appleton et al., 2008; Fredricks et al., 2004; Jimerson, Campos, & Greif, 2003; Wang, Willet, & Eccles, 2011). Early researchers tended to conceptualize student engagement as a two-dimensional construct that comprised behavioral and affective (or emotional) dimensions (Finn, 1989; Finn & Voelkl, 1993; Ryan, Stiller, & Lynch, 1994). Examples of indicators of affective engagement include sense of belonging, identification with schools, and interest in learning, and those of behavioral engagement include class participation, task completion, effort, and attendance.

In recent years, researchers have incorporated a third dimension into the conceptualization of student engagement, namely a cognitive one (Fredricks et al., 2004; Jimerson et al., 2003; Wang et al., 2011). Examples of indicators of cognitive engagement include the use of learning strategies, execution of a particular work style, and self-regulated learning. The incorporation of the cognitive dimension into the construct is important because it captures the processes and strategies used by students in learning. To be truly engaged in school, it is important for students to involve themselves cognitively in the learning process. This three-part typology has become the most prevalent conceptualization of student engagement in the current literature.

It is worthwhile to note that some researchers have made an attempt to put forward a four-part typology by incorporating a fourth dimension, namely an academic one, into the construct of student engagement (Appleton, Christenson, Kim, & Reschly, 2006). Examples of indicators of academic engagement include the time spent on task and the number of credits earned for graduation. Although incorporating more dimensions into the construct may provide a richer characterization of students, it is, however, also necessary for researchers to clarify the nature of the dimensions before incorporating them into the existing construct. A comprehensive but vague multidimensional construct may result in redundancy and confusion. For instance, time spent on task in academic engagement can also be conceptualized as a component of behavioral engagement (Skinner & Belmont, 1993). The inclusion of academic engagement may result in redundancy. To preserve uniqueness of each dimension and avoid redundancy, the present study adopts the three-part typology and does not include academic engagement in the conceptualization of student engagement.

Indicators, Facilitators, and Outcomes of Student Engagement

Another area of confusion about the conceptualization of student engagement is related to the distinction between the indicators versus the facilitators of student engagement. Indicators refer to the features that define student engagement, whereas facilitators are contextual factors that exert influences on student engagement (Skinner, Furrer, Marchand, & Kindermann, 2008). It is important to have a clear distinction between the two. In recent years, however, some researchers included contextual factors, such as teacher–student relationships, in their conceptualization of student engagement (e.g., Appleton et al., 2006). As a consequence, it is not possible for researchers to study how contextual factors may affect the development of student engagement.

In addition, there is a parallel concern regarding the inclusion of outcome variables in the construct of student engagement. Some researchers have included outcome variables, such as attendance and conduct problems, in their conceptualization of student engagement (e.g., Finn & Voelkl, 1993; Wang et al., 2011). Similarly, this conceptualization does not allow for the investigation of outcomes resulting from student engagement.

Student engagement is a psychological process that mediates the effects of the contextual antecedents on student outcomes. It is the students' effort, interest, enjoyment, and absorption in initiating and sustaining learning activities in school (Furrer & Skinner, 2003). In the past decade, many researchers have investigated how student engagement mediated the effects of contextual factors, such as classroom climate (Reyes, Brackett, Rivers, White, & Salovey, 2012) and structural characteristics of families (Benner, Graham, & Mistry, 2008), on both academic and nonacademic outcomes (Liem & Martin, 2011). Academic outcomes may include school grades, performance, and achievement whereas nonacademic outcomes may include a wide range of desirable educational and psychological outcomes, such as self-esteem (Liem & Martin, 2011), peer acceptance (Hughes & Kwok, 2006), life satisfaction (Lewis, Huebner, Malone, & Valois, 2011), and lack of conduct problems (Li et al., 2011). To conceptualize the facilitators and outcomes as part of the student engagement would have prevented all the above meaningful investigations of its antecedents and consequences.

Although preserving the comprehensiveness of the construct, there is a simultaneous need to distinguish the indicators of the student engagement construct from its facilitators and outcomes. Thus, the present study adopts a three-part typology of student engagement that

includes the affective, behavioral, and cognitive dimensions with an attempt to streamline the components of student engagement by separating the indicators, facilitators, and outcomes of student engagement.

Three Dimensions of Student Engagement

Affective engagement refers to students' feelings about learning (Connell & Wellborn, 1991; Skinner & Belmont, 1993) and the school they attend (Finn, 1989; Voelkl, 1997). Students may feel bored or interested in learning activities. They may also feel alienated or attached to their school. The feelings about learning activities are a reflection of intrinsic motivation whereas the feelings about the school are a manifestation of school bonding. In the present conceptualization, students with high affective engagement are intrinsically motivated to learn and feel attached to their schools.

Behavioral engagement refers to effort and persistence in schoolwork (Birch & Ladd, 1997) and participation in extracurricular activities (Finn, Pannozzo, & Voelkl, 1995). Although positive discipline in class and high attendance rates were regarded as behavioral engagement by some researchers (Finn & Voelkl, 1993), they are not included in the present conceptualization as many researchers regard attendance and discipline as the outcomes instead of the indicators of the construct (e.g., Ekstrom, Goertz, Pollack, & Rock, 1986; Li et al., 2011). In the present conceptualization, students with high behavioral engagement are diligent in learning activities and active in extracurricular activities.

Cognitive engagement refers to the cognitive strategies that students adopt and employ during the learning process (Walker, Greene, & Mansell, 2006). Although self-regulated learning is included in the cognitive dimension by some researchers (e.g., Fredricks et al., 2004), it is not included in the present conceptualization because it is not believed to be purely cognitive. For example, self-monitoring as a self-regulated strategy is behavioral in nature. In the present conceptualization, students who have high cognitive engagement participate more in deep cognitive processing and have better understanding and retention of meaningful material.

The components of each of the three dimensions of student engagement are built upon existing constructs that are well-established in the literature. For instance, students' feelings toward learning, a component of affective engagement, reflect intrinsic motivation. It is a well-researched construct in learning and motivation (e.g., Ryan & Deci, 2000). The feelings of attachment to school, on the other hand, are the reflection of school bonding, a construct that is well-researched in intervention and prevention research (e.g., Maddox & Prinz, 2003). Effort and persistence, included in the dimension of behavioral engagement, are well-studied in research pertaining to achievement motivation (e.g., Wolters, 2004). Deep cognitive processing, a component of cognitive engagement, is an important construct in the research on self-regulated learning (e.g., Wolters, Yu, & Pintrich, 1996).

There are many advantages to building a metaconstruct on well-researched and well-defined constructs. This enables researchers to tap into the existing body of knowledge and examine the additive and interactive effects of the different dimensions of student engagement both simultaneously and dynamically. Compared with the research that focuses on only one dimension, the study of student engagement as a metaconstruct provides a new and comprehensive perspective to facilitate researchers and practitioners in their understanding of student learning and promote appropriate intervention strategies to help at-risk students. Moreover, the collaboration among international scholars informing the development and analysis of the current scale affords an opportunity to yield a measure appropriate for use internationally.

Development of a Student Engagement Scale

Many instruments have been developed to measure student engagement. Although the existing scales have their own strengths in measuring the construct, most are not consistent with the conceptualization illustrated above. For example, the six-factor instrument of Appleton, Christenson, Kim, and Reschly (2006) includes facilitators of student engagement, whereas the four-factor instrument of Skinner et al. (2008) and the two-factor instrument of Finn, Pannozzo, and Voelkl (1995) do not measure cognitive engagement. In addition, the three-factor instrument developed by Fredricks, Blumen-

feld, Friedel, and Paris (2003) includes student outcomes, such as discipline, in the measure. Similarly, the three-dimensional instrument developed by Wang, Willet, and Eccles (2011) also includes conduct and misconduct in the measure. Furthermore, previous efforts have not incorporated international collaborations to inform the potential for use of a common measure of student engagement in school across countries. To capture student engagement as a distinct metaconstruct with affective, behavioral, and cognitive dimensions, and appropriate for use internationally, there is a need to develop a new measure.

A new measure of student engagement has been developed by a team of researchers from 12 countries, namely Austria, Canada, China, Cyprus, Estonia, Greece, Malta, Portugal, Romania, South Korea, the United Kingdom, and the United States. The development of this measure was part of a multicountry project initiated by the research committee of the International School Psychology Association (Lam et al., 2012).

The Present Study

The present study focuses on the psychometric properties of the student engagement scale developed in this international collaborative project. The reliability and validity of this newly developed scale were examined. Regarding reliability, the coefficient alphas of the item-scores in each subscale and of the subscale scores in the full scale are expected to be high. The correlations between the scores from the first and second tests are also expected to be high. Regarding construct validity, the data are expected to fit a second-order model derived from the three-part typology of student engagement. In this model, affective, behavioral, and cognitive dimensions are the first-order factors and student engagement as a metaconstruct is the second-order factor.

The concurrent validity of the measure was also examined in the present study. Considering the extant conceptual and empirical literature, the following results are anticipated if the measure has good concurrent validity. It is expected that there is high association between the measure and contextual factors, such as teacher practices and support (McCombs, 2010), peer support (Polychroni, Hatzichristou, & Sideridis, 2012), and parent support (Hoover-Dempsey & Sandler, 1995). As for the association with outcomes, it is also expected that student engagement correlates positively with positive emotions and negatively with negative emotions (Reschly, Huebner, Appleton, & Antaramian, 2008). Finally, students who have high levels of engagement with school are expected to have better academic performance and conduct at school (Connell et al., 1994; Skinner & Belmont, 1993).

Method

Participants

The participants were 3,420 junior secondary school students and their homeroom teachers ($N = 156$) from 12 countries (Austria, Canada, China, Cyprus, Estonia, Greece, Malta, Portugal, Romania, South Korea, the United Kingdom, and the United States). According to an a priori sampling plan, 300 students were included in each country (100 seventh graders, 100 eighth graders, and 100 ninth graders). For the sake of cross-country comparison, all the students were recruited from schools in urban areas. We did not recruit students from rural areas or agricultural communities. To ensure the sample was comparable across all countries, we did not include academically selective schools for high achievers, special schools for students with special education needs, or schools from very low or high socioeconomic areas. In total, 48 schools from 25 cities were involved in the project. The details of the sample are presented in Table 1.

Procedures

Participants completed a questionnaire in their schools that included questions about their engagement in school, perceptions of instructional contexts, teacher support, peer support, parent support, and emotional functioning. The questionnaire was either administered by their teachers or by researchers from the project. Every item of the measures in the questionnaire was scrutinized by all the 18 researchers from the 12 countries for cultural appropriateness to their country. Then back-translation procedures (Brislin, 1970) were adopted when the questionnaire was translated into the local languages.

Table 1
The Demographics of the Samples in the 12 Countries

Country	Cities	Schools	*N*	Grade	Age
Austria	Graz	1	154	7th: 35.7%	13.70
			F: 59.7%	8th: 31.2%	(1.04)
			M: 39.6%	9th: 33.1%	
Canada	Barrie & Orillia	9	300	7th: 33.3%	13.42
			F: 49.7%	8th: 33.3%	(1.01)
			M: 50.3%	9th: 33.3%	
China	Hangzhou, Hong Kong, & Kunming	3	300	7th: 33.3%	14.13
			F: 50.7%	8th: 33.3%	(1.23)
			M: 49.3%	9th: 33.3%	
Cyprus	Larnaka	4	300	7th: 33.3%	13.72
			F: 54.4%	8th: 33.3%	(0.99)
			M: 45.6%	9th: 33.3%	
Estonia	Tallinn, Saue, Keila, & Rapla	4	303	7th: 20.9%	14.73
			F: 45.9%	8th: 38.7%	(0.89)
			M: 54.1%	9th: 40.4%	
Greece	Athens	6	300	7th: 33.3%	13.56
			F: 48.0%	8th: 33.3%	(1.01)
			M: 52.0%	9th: 33.3%	
Malta	Hamrun & St. Lucija	2	280	7th: 29.3%	12.86
			F: 50%	8th: 30.0%	(1.10)
			M. 50%	9th: 40.7%	
Portugal	Lisbon, Ponta, Delgada, Évora, Aveiro, & Braga	5	260	7th: 38.5%	13.78
			F: 57.7%	8th: 30.8%	(1.17)
			M: 41.9%	9th: 30.8%	
Romania	Bucharest	4	300	7th: 33.3%	14.38
			F: 50%	8th: 33.3%	(0.95)
			M: 50%	9th: 33.3%	
South Korea	Seoul & Gwangju	5	300	7th: 37.0%	13.55
			F: 51.7%	8th: 34.3%	(0.92)
			M: 48.3%	9th: 28.7%	
United Kingdom	St. Helens	1	323	7th: 39.0%	13.00
			F: 50.8%	8th: 31.6%	(1.00)
			M: 49.2%	9th: 29.4%	
United States	Santa Barbara & Riverside	4	296	7th: 51.3%	14.31
			F: 46.5%	8th: 7.0%	(0.93)
			M: 53.5%	9th: 41.7%	

Note. F is female and M is male. Numbers in parentheses are standard deviations.

The questionnaire was first translated from English into the local language by a translator. It was then translated back to English by another translator. The researchers, who were well-versed in both English and the local language, compared the original questionnaire with the back-translated questionnaire. If they detected any discrepancy in an item, they would translate it again into the local language with different wording and ask the back-translator to translate it into English again. The process would be repeated until no discrepancy could be found. Apart from detecting discrepancy between the original and back-translated questionnaires, these bilingual researchers were also responsible for ensuring that the reading level of the translated questionnaire was appropriate for seventh graders in their countries by piloting it with a small group of students.

As there is no equivalent of an "Institution Review Board" in all the 12 countries, the practice on parental consent was not standardized. Active parental consent was sought in Canada and the United States, whereas passive parental consent was sought in Austria, Estonia, Malta, Romania, and the United Kingdom. Other procedures, such as seeking approval from school principals, were adopted in the other countries. The consent rates for the active parent consent procedures in Canada and the United States

were 64% and 84%, respectively. The consent rates for the passive parental consent procedure in Austria, Estonia, Romania, and the United Kingdom ranged from 97% to 100%. The questionnaire was administered at the end of a semester and the students were asked to answer the questions with respect to their experience during that semester. When the students completed the questionnaires, their teachers also completed a rating form on their academic performance and school conduct. Verbal consent was obtained from the teachers for their participation in the study. For each of the students in their class, the teachers rated three items on academic performance and three items on conduct. The teachers' ratings were used as the measures of students' academic performance and conduct.

Student Report Measures

Student engagement. Student engagement was measured by a scale consisting of three subscales: affective engagement, behavioral engagement, and cognitive engagement (see Appendix). At first, over 50 items had been generated from an extensive review of past studies with measurements of student engagement (e.g., Dowson & McInerney, 2004; Elliot, McGregor, & Gable, 1999; Finn et al., 1995; Greene & Miller, 1996; Greene, Miller, Crowson, Duke, & Akey, 2004; Hill & Werner, 2006; Miller, Greene, Montalvo, Ravindran, & Nichols, 1996; Rao & Sachs, 1999; Samuelstuen & Bråten, 2007; Skinner & Belmont, 1993; Wolters, 2004). Then two phases of pruning these 50 items were conducted. In the first phase, the first and the third authors of the current article identified and deleted the ambiguous and redundant items. In the second phase, they sent 35 items to all the 18 researchers from the 12 countries for comments and suggestions. According to the standards for educational and psychological testing (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999), these researchers were requested to consider the content of the items in relation to the cultural background and prior experiences of the junior secondary school students in their countries. The discussion among all the researchers from the 12 countries was conducted through e-mail. After 3 months of discussion, two items (e.g., "I volunteer to help with school activities such as carnival and fund-raising events") were excluded but the remaining 33 items that were acceptable to all these researchers and that best capture the three dimensions of student engagement were retained. The affective engagement subscale (nine items) assesses students' liking for learning and school. The behavioral engagement subscale (12 items) measures students' effort in learning and participation in school activities. The cognitive engagement subscale (12 items) evaluates students' use of meaningful information processing strategies in learning. All items and their sources are listed in the Appendix. The literature source included the studies not only from North America (e.g., Skinner & Belmont, 1993) but also Europe (e.g., Samuelstuen & Bråten, 2007), Asia (e.g., Rao & Sachs, 1999), and Australia (e.g., Dowson & McInerney, 2004).

The students were asked to indicate their agreement to the affective and behavioral engagement items on a 5-point scale, with 1 for *strongly disagree* and 5 for *strongly agree*. As for the cognitive engagement items, they were asked to indicate how frequently they did so on a 5-point scale, with 1 for *never* and 5 for *always*. The mean of the item scores on each subscale was used to indicate student engagement in the relevant dimension. Furthermore, the average of the three subscale scores was used as the measure of student engagement. High scores indicated high levels of engagement.

Perceived instructional practices. Student perceptions of their teachers' instructional practices were measured by the Motivating Instructional Contexts Inventory (MICI; Lam, Pak, & Ma, 2007). The MICI is composed of 24 items, with four items in each of the following six subscales: challenge, real life significance, curiosity, autonomy, recognition, and evaluation. They respectively measure the extent to which students perceive that teachers provide them with challenging tasks, ensure real-life significance in learning activities, arouse curiosity, grant autonomy, recognize effort, and provide useful feedback for improvement. The students were asked to indicate how many of their teachers adopt the teaching strategies described in the statements (e.g., "Teachers help us to understand the use of what we are learning") on a

5-point scale, with 1 for *none of them* and 5 for *all of them*. The mean of the six subscale scores was used as an index of how they perceived the motivating instructional contexts in their school. High scores indicated that the students perceived that most of the teachers in their school adopted motivating instructional practices. In the current sample, the coefficient α of the six subscale scores was .91 (95% CI: .90, .91).

Perceived teacher support. The students' perception of the social and emotional support received from their teachers was measured by three items adapted from the Caring Adult Relationships in School Scale of the California Healthy Kids Survey (WestEd, 2000). The students were asked to indicate how much they agreed with these statements (e.g., "At my school, there is a teacher who is kind to me") on a 5-point scale, with 1 for *strongly disagree* and 5 for *strongly agree*. The mean of the three item-scores was used to indicate the students' perception of the social and emotional support they received from their teachers. High scores indicated high social and emotional support from teachers. In the current sample, the coefficient α of the three item-scores was .79 (95% CI: .77, .80).

Perceived peer support. Students' perception of the social and emotional support they received from their peers was measured by three items adapted from the Caring Peer Relationships in School Scale of the California Healthy Kids Survey (WestEd, 2000). The students were asked to indicate how much they agreed with these statements (e.g., "At my school, I have a friend who really cares about me") on a 5-point scale, with 1 for *strongly disagree* and 5 for *strongly agree*. The mean of the three item-scores was used to indicate the students' perception of the socio and emotional support they received from their peers. High scores indicated high social and emotional support from peers and low scores indicated otherwise. In the current sample, the coefficient α of the three item-scores was .82 (95% CI: .81, .83).

Perceived parent support. Student perception of parent support was measured by eight items adapted from the components of home support for learning in the Functional Assessment of Academic Behavior (Ysseldyke & Christenson, 2002). The students were asked to indicate how often their parents did the things that were described in the statement (e.g., "My parents try their best to provide me with the resources for studying and learning, such as books, quiet study place, and computer") on a 5-point scale, with 1 for *never* and 5 for *always*. The mean of the eight item-scores was used to indicate students' perception of the parental support they received for learning. High scores indicated high parent support. In the current sample, the coefficient α of the eight item-scores was .85 (95% CI: .84, .85).

Positive emotions. Two positive emotions (happiness and caring) were selected from the emotional functioning scale of Diener, Smith, and Fujita (1995). The students were asked to indicate how often they experienced these emotions in the semester on a 5-point scale, with 1 for *never* and 5 for *always*. The correlation between these two positive emotions was .33, $p < .01$. The mean of these two emotions was used to indicate how frequently the students experienced positive emotions.

Negative emotions. Four negative emotions (anxiety, anger, shame, and sadness) were selected from the emotional functioning scale of Diener et al. (1995). The students were asked to indicate how often they experienced these emotions in the semester with the same scale for positive emotions. The mean of these four emotions was used to indicate how frequently the students experienced negative emotions in the semester. In the current sample, the coefficient α of the four item-scores was .63 (95% CI: .61, .65).

Teacher Report Measures

Academic performance. The homeroom teachers reported the students' academic performance in a rating form. In countries where students did not have homeroom teachers, teachers who had the most contact with the students completed the report. They reported to what extent each of the students in their class was "good at schoolwork," had "good performance on tests," and did "well on assignments." They were required to indicate their agreement with these statements on a 5-point scale, with 1 for *strongly disagree* and 5 for *strongly agree*. The mean of these three item-scores was used as an indicator of the students' academic performance. High scores indicated good school performance. In the current sample, the coefficient

α of the three item-scores was .93 (95% CI: .93, .94).

School conduct. The teachers also reported to what extent each of the students in their class "is well behaved in class," "follows all of the rules," and "never gets in trouble in class." The teachers indicated their agreement with these statements on a 5-point scale, with 1 for *strongly disagree* and 5 for *strongly agree*. The mean of these three item-scores was used as an indicator of the students' conduct in school. High scores indicated good school conduct. The coefficient α of the three item-scores was .94 (95% CI: .93, .94).

Data Analyses

Before the main analyses, we first examined the normality of the data in each of the countries as well as the aggregated data. Second, we examined the intraclass correlation (ICC) of the full-scale scores of student engagement between countries. Checking the ICC was a necessary step to ascertain whether the data from the 12 countries could be aggregated for analyses. Third, both the internal and test–retest reliabilities of the scale were examined. Fourth, confirmatory factor analyses were employed to examine the construct validity of the scale, testing a one-factor model, a three-factor model, and a second-order model. Lastly, concurrent validity was examined through correlational analyses to test the associations between the scale with contextual factors (i.e., instructional practices, teacher support, peer support, parent support) and outcomes (i.e., positive emotions, negative emotions, academic performance, school conduct).

Results

Normality of Data

Checking variables for normality is an important early step in multivariate analyses. Nonnormality of data may erode the accuracy of estimation in analyses of covariance structure. Due to the facts that it may not be feasible to examine all aspects of multivariate normality and that most statistical tests for detection of possible violation of multivariate normality are not free from limitations, Kline (2011) suggested that researchers inspect univariate distributions to detect multivariate non-normality. Skewness and kurtosis are two components of normality. For normal distribution, both should not be significantly different from zero. Table 2 presents the mean, *SD*, skewness, and kurtosis of the three subscale scores and the full-scale scores of each country. Given the large sample size, *Z* tests of the null hypothesis assuming no population skewness or kurtosis may not be helpful because even slight departure of normality could turn out to be statistically significant (Kline, 2011). Instead of conducting *Z* tests, we interpreted absolute values of skew index and kurtosis index. Although there are few definite criteria for interpreting values of skewness and kurtosis, researchers often suggest that variables with the skewness index $> |3.0|$ indicate extreme skewness and those with the kurtosis index $> |8.0|$ indicate extreme kurtosis (Kline, 2011). There were no variables exceeding such criteria as shown in Table 2; thus, normality of the data is acceptable.

Intra-Class Correlation Between Countries

The ICC of the full-scale scores of student engagement between countries was examined by a fully unconditional hierarchical linear modeling (HLM) analysis (Raudenbush & Bryk, 2002). If the intraclass correlation (ICC) is large, student engagement is not independent across countries and the results will be biased if the data are aggregated for analyses. The results of the HLM analysis showed that the ICC was .09, indicating that only 9% of the variance in student engagement resided between countries. The vast majority of variance (91%) was at the student level. Lee (2000) suggested that it would be necessary to conduct multilevel analyses only when the ICC is greater than 10% of the total variance in the outcome variable. Thus, the between-country variance is regarded as trivial and it was justified to aggregate the data from the 12 countries for further analyses.

Internal Reliability

Coefficient alphas of the item scores of each subscale and the subscale scores of the full scale are presented in Table 3. A high level of internal consistency was demonstrated for all three subscales ($\alpha = .80–.89$). The full scale also demonstrated acceptable internal consistency ($\alpha = .78$).

Table 2
Descriptive Statistics of the Subscale and Full-Scale Scores of the 12 Countries

Scales	Austria (n = 154)	Canada (n = 300)	China (n = 300)	Cyprus (n = 300)	Estonia (n = 303)	Greece (n = 300)	Malta (n = 280)	Portugal (n = 260)	Romania (n = 300)	South Korea (n = 300)	United Kingdom (n = 323)	United States (n = 300)	Total (n = 3,420)
Affective													
Mean	3.76	3.56	3.25	3.44	3.15	3.52	3.50	3.56	3.49	2.93	3.30	3.50	3.40
SD	.56	.64	.65	.69	.66	.64	.72	.65	.68	.64	.68	.75	.70
Skewness	−.37	−.53	−.33	−.38	−.25	−.60	−.21	−.05	−.64	−.17	−.07	−.51	−.32
Kurtosis	.24	.07	.79	.11	−.17	1.00	−.34	−.23	.56	.62	−.18	.18	.05
Behavioral													
Mean	3.65	3.56	3.50	3.61	3.26	3.73	3.46	3.53	3.49	3.18	3.41	3.40	3.47
SD	.51	.60	.52	.63	.58	.62	.55	.56	.52	.55	.56	.69	.60
Skewness	−.30	−.47	−.44	−.09	−.39	−.44	.11	.31	−.40	−.27	.03	−.16	−.18
Kurtosis	.20	.43	1.89	−.51	.08	.02	−.12	−.25	.45	.10	−.06	−.17	.11
Cognitive													
Mean	3.35	3.19	3.16	3.35	3.11	3.31	3.36	3.59	3.53	2.85	3.22	3.12	3.24
SD	.62	.68	.65	.69	.69	.65	.69	.63	.60	.79	.67	.83	.71
Skewness	−.32	−.23	.15	−.01	−.47	−.45	−.22	.24	−.35	−.20	−.10	−.26	−.28
Kurtosis	.61	.19	1.01	.05	.63	.19	.14	−.18	.97	.11	.30	.16	.43
Full-Scale													
Mean	3.59	3.44	3.30	3.47	3.17	3.52	3.44	3.56	3.50	2.99	3.31	3.34	3.37
SD	.45	.52	.51	.55	.53	.51	.55	.54	.48	.56	.53	.64	.56
Skewness	−.05	−.49	−.25	−.11	−.30	−.67	.07	.24	−.61	−.25	−.00	−.29	−.27
Kurtosis	−.06	.51	2.06	.22	.03	1.42	−.36	−.11	1.20	.32	−.11	.27	.43

Table 3
Descriptive Statistics, Reliability, and Subscale Score Correlations

	Mean (*SD*)	1	2	3	4
1. Affective engagement	3.40 (0.70)	—			
2. Behavioral engagement	3.47 (0.60)	.63**	—		
3. Cognitive engagement	3.25 (0.71)	.48**	.54**	—	
4. Full-scale	3.37 (0.56)	.85**	.85**	.82**	—
Coefficient α		.84	.80	.89	.78
Test–retest reliability		.74**	.73**	.60**	.73**

Note. Numbers in parentheses are standard deviations. The test–retest reliability was measured on 100 students from Hong Kong over a 6-month period. The range of scores for each of the scales is 1 to 5.
** $p < .01$.

Test–Retest Reliability

The student engagement scale was administered again to the Hong Kong subsample ($n = 100$) 6 months later. The correlations between the two tests suggest a satisfactory reliability for the subscales and also the full scale (see Table 3).

Construct Validity

One-factor model. LISREL8.8 (Jöreskog & Sörbom, 2007) was used to test a one-factor model with all 33 items as indicators of a single latent construct, student engagement. Missing data were replaced by the expectation-maximization method (SPSS, 2007). Of the 112,860 expected responses in the data set (3,420 participants × 33 items), 702 responses were replaced. The replaced values represented 702/112,860 or .006 of the response data, less than 1%. With these missing data replaced, the following are the results of the one-factor model testing: $\chi^2 = 14993.46$, $df = 495$, $p < .001$; NNFI = .88; CFI = .89; RMSEA = .11. The NNFI is the Non-Normed Fit Index and the CFI is the Comparative Fit Index. Each index should be at least larger than .90 to support reasonable goodness of fit (Hu & Bentler, 1998). RMSEA is the root mean square error of approximation. An RMSEA value of less than .05 indicates close fit; RMSEA between .05 and .08 indicates reasonable fit, and RMSEA larger than .10 indicates inadequate fit (Browne & Cudeck, 1993). The results indicated that the one-factor model did not fit the data well.

Three-factor model. A three-factor model was then tested. It was a model with three latent constructs: affective engagement, behavior engagement, and cognitive engagement. The items in each of the respective subscales were specified as the indicators of these constructs. In addition, the covariances of the three latent constructs were set free. The analysis had the following results: $\chi^2 = 9849.65$, $df = 492$, $p < .001$; NNFI = .92; CFI = .93; RMSEA = .08. These results indicated that this three-factor model was a reasonable representation of the data.

Second-order model. Lastly, a second-order model with student engagement as a meta-construct was tested. In this model, affective engagement, behavior engagement, and cognitive engagement were specified as the first-order factors whereas student engagement was specified as the second-order factor. The analysis had the following results: $\chi^2 = 9849.65$, $df = 492$, $p < .001$; NNFI = .92; CFI = .93; RMSEA = .08. These results indicated that this second-order model was also a reasonable representation of the data.

Of the three models, the one-factor model was first eliminated because it does not have theoretical and empirical support. Theoretically, the one-factor model masks the three dimensions of student engagement. Empirically, the fit indices did not show that it fit the data well. In comparison, the fit indices showed that both the three-factor model and the second-order model fit the data reasonably well. Nevertheless, the second-order model is preferred because it is a more parsimonious model (Weston & Gore, 2006). It is consistent with the understanding that student engagement is a meta-construct encompassing three dimensions: affective, behavioral, and cognitive dimensions. The arithmetic mean of these three subscale scores

could be a parsimonious measure of student engagement.

Concurrent Validity

To test the concurrent validity of the student engagement scale, the correlations between the scale and the contextual factors, namely instructional practices, teacher support, peer support, and parent support, were examined. The correlations of the three subscales and the full scale with these contextual factors are presented in Table 4. All three subscales and the full scale correlated moderately and positively with these contextual factors.

The correlations of the three subscales and the full scale with the outcome variables were also examined. All three subscales and the full scale correlated positively with positive emotions, academic performance and school conduct. Their associations with negative emotions were small although some coefficients were statistically significant, which was likely due to the large sample size. It is also noted that compared with those of affective engagement and behavioral engagement, the correlations of cognitive engagement with academic performance and school conduct were relatively smaller.

Discussion

The purpose of this study was to investigate the psychometric properties of a student engagement scale which was administered in 12 countries. The results revealed that the scale had good internal consistency and test–retest reliability. Furthermore, the data from the 12 countries fit well to a second-order model with affective, behavioral, and cognitive engagement as the first-order factors and student engagement as the second-order factor. The results support the conceptualization that student engagement is a metaconstruct with affective, behavioral, and cognitive components. In addition, the correlations of the scale with instructional practices, teacher support, peer support, parent support, emotions, academic performance, and student conduct provide evidence of concurrent validity of the scale. The findings from this international study using this student engagement scale are generally consistent with extant scholarship. Key findings and implications for school psychology scholarship and practice are discussed in the following sections.

Association Between Student Engagement and Contextual Factors

Previous studies have shown relations between teaching practices and students' motivation, task-persistent behavior, and learning (McCombs, 2010; Meece, Anderman, & Anderman, 2006; Perry et al., 2006; Wentzel, 2010). Similarly, the current study found that students had higher engagement when they perceived that teachers used more motivational instructional strategies ($r = .50$) and provided more emotional support ($r = .48$). Wentzel (1998) previously found that peer support was a positive predictor of prosocial goal pursuit whereas teacher support was a positive predictor of

Table 4
Descriptive Statistics, Correlations Between Student Engagement, Contextual Factors, and Outcome Variables

	Mean (*SD*)	Affective engagement	Behavioral engagement	Cognitive engagement	Full-scale
Perceived instructional practices	2.98 (0.74)	.45**	.38**	.41**	.50**
Perceived teacher support	3.78 (0.93)	.45**	.42**	.34**	.48**
Perceived peer support	4.11 (0.92)	.24**	.23**	.23**	.28**
Perceived parent support	3.93 (0.79)	.35**	.37**	.35**	.43**
Positive emotions	3.55 (0.92)	.36**	.26**	.27**	.36**
Negative emotions	2.63 (0.75)	−.08**	−.07**	.03	−.04*
Academic performance	3.64 (1.02)	.20**	.27**	.18**	.25**
School conduct	3.96 (1.01)	.22**	.26**	.14**	.24**

Note. Numbers in parentheses are standard deviations.
* $p < .05$. ** $p < .01$.

school-related interest. Findings from the current study appear consistent with previous studies, revealing that peer support is important, although when the matter of concern is school-related interest, teacher support is more important than peer support. Associations between student engagement and parental support (r = .43) were comparable with teacher support (r = .48), and higher than those with peer support (r = .28). Although parental involvement in their children's education declines with years and the highest involvement is at the beginning of elementary school (Green, Walker, Hoover-Dempsey, & Sandler, 2007; Kikas, Peets, & Niilo, 2011), it still retains its importance in secondary school (Hill & Tyson, 2009; Seginer, 2006).

Association Between Student Engagement and Outcomes

There was a moderate correlation between student engagement and positive emotions. In contrast, correlation between student engagement and negative emotions was very low. One of the reasons for such low correlation may be cultural differences in expressing emotions (Eid & Diener, 2001). Specifically, expressing anger is disapproved of in some cultures (Mesquita & Frijda, 1992). In addition, the meaning of emotion may differ between cultures (Uchida & Kitayama, 2009).

In the present study, behavioral engagement had high correlation with academic performance and school conduct (r = .27 and r = .26, respectively) and the lowest with cognitive engagement (r = .18 and r = .14, respectively). The relatively low correlation with the cognitive dimension warrants further consideration. One might expect that when a child elaborates materials and organizes information in a meaningful manner and tries to understand it, his or her educational outcomes are better. One of the reasons for such low associations may be that teachers were not asked about how well a student understands the material but more about outside indicators listed in the academic performance rating form (e.g., does well on assignments, is good at tests). Children who do well on tests may be performance-oriented, while it is the mastery-orientation which is highly related to using cognitive strategies in trying to understand the learnt material (e.g., Eccles & Wigfield, 2002). Children who are performance-oriented care about the positive evaluation of their performance more than mastery of the learning task. In contrast, children who are mastery-oriented care about the mastery of the learning task more than the positive evaluation of their performance. Another reason may be related to cultural differences as well as school differences in the conceptualization and assessment of good behavior and good performance. Classroom environments may vary to a great extent due to teachers' beliefs and cultural norms (Hamre & Pianta, 2010). Further research is necessary to explore variables that may moderate the relations of engagement to academic performance and school conduct. Potential moderators might be either contextual or personal factors that influence student engagement, academic performance, and behavioral conduct.

The fact that the correlations of student engagement with academic performance and school conduct ranged from .14 to .27 indicates low associations. The low associations might be due to differences in the source of data. Student engagement was based on student reports, and academic performance and school conduct were based on teacher reports. Nevertheless, the low correlations might also point to two other possibilities. First, student engagement is only one of the many factors that are associated with academic performance and school conduct. These outcome variables may be consequences of other factors (e.g., instructional practices) that also deserve attention from researchers and educators. Second, the low correlations provide some support for excluding academic performance and school conduct from the conceptualization of student engagement. If these outcome variables are regarded as the core components of student engagement, interrelations among indicators of student engagement would have been weak. To summarize, the low correlations suggest that student engagement may be one of the many factors that contribute to academic achievement and school conduct. The latter two are unlikely part of student engagement.

Contributions to Scholarship and Practice

In the present international study, student engagement is conceptualized as a multidimen-

sional construct with affective, behavioral, and cognitive components. Each of these dimensions is built on the well-researched and well-defined constructs in the extant literature (Fredricks et al., 2004; Jimerson et al., 2003; Wang et al., 2011). This conceptualization enables researchers to tap into the existing body of knowledge and examine the additive and interactive effects of the different dimensions of student engagement both simultaneously and dynamically. In this conceptualization, facilitators and outcomes are not included in the construct of student engagement. Researchers are therefore able to investigate the contextual factors that may contribute to student engagement and also the outcomes that student engagement may produce.

Using the multidimensional construct described above, we developed a measure of student engagement for school psychologists, researchers, and education professionals around the world. They can use it to describe and study student engagement at both specific and global levels. At the specific level, they can examine how each dimension is related to an array of contextual variables and outcome variables. At the global level, they can use the composite score of the three subscales to capture student engagement in general. The former approach allows for investigation concerning specific dimensions whereas the latter approach allows for more comprehensive and parsimonious analyses. Irrespective of the approach adopted, the scale provides practitioners and researchers a useful tool to measure and study student engagement. For instance, school psychologists can use it to better understand the engagement of individual students and engagement among specific populations of students within schools. Information about student engagement may be used to inform prevention and intervention strategies that may benefit students, and when used annually, may also provide valuable information pertaining to the impact of prevention and intervention strategies aimed at further enhancing student engagement in schools.

A measure of student engagement developed through international collaboration is helpful to many countries, particularly those with a short history of school psychology and few good tools for assessment and research. This new scale provides new possibilities to researchers and school psychologists in different countries. In addition, the findings from this study across 12 countries offer a foundation for further international scholarship to advance our global understanding of the importance of student engagement. The use of a common measure of student engagement in school in countries around the world affords opportunities to advance our local and global understanding of this construct. There are further opportunities to examine how culturally specific variables (e.g., collectivism, emphasis on academic excellence) affect student engagement across countries. For example, although motivating instructional contexts which are characterized by challenge, autonomy, recognition of progress, real life significance, and so forth have been generally found to be effective in improving student engagement and academic performance, a Korean study (Shin, 2009) reported unexpected results showing that such allegedly motivating instructional contexts were negatively related to students' school grades. Only through the mediation of students' engagement in academic lessons and use of academic skills (e.g., critical thinking skills), these motivating instructional contexts were linked to improved school grades. In countries with a competitive education system that puts heavy emphases on school grades, students may perceive such instructional contexts as not conducive, although not harmful, to their academic success. As different cultures may have different interpretations of academic success, it would be worthwhile for researchers to take a cross-cultural perspective toward student engagement in school across countries with different cultures, social conditions, economic prosperity, educational policies, and standards of success.

Limitations and Future Directions

Despite its contributions, the present study also has several limitations. First, the procedures for parental consent were not standardized across the 12 countries. It is possible that the students who volunteered to participate and sent in parental consent forms were those who were more engaged in school. In future studies that involve data from several countries, researchers need to further consider parental consent procedures that may cause sample bias. Second, student engagement was assessed only by self-report measures from students. Although self-reports are

valid measures of subjective psychological constructs, using information from teachers, parents, peers and third-party observers would add to the validity and the robustness of the study. Third, academic performance was only measured by teacher ratings. Although teacher ratings are a reliable source of information when types of behavior assessed are likely to occur in the school environment and these are highly correlated with standardized test scores (Gruman, Harachi, Abbott, Catalano, & Fleming, 2008), future studies using grade point averages (GPAs) or objective achievement tests are warranted. Fourth, although 12 countries participated in the study, the sample is not representative of all cultures. For instance, further investigation including countries in South America and Africa is warranted. Furthermore, the results cannot be generalized beyond urban samples as only urban schools took part in the present study. Adolescents in suburban or rural areas warrant further study within and between countries. The measure of positive emotions only consisted of two items and the correlation between them was not high. In addition, the internal consistency of the measure of negative emotions was not high (.63). Future investigation may consider using all the 24 emotions in the emotional functioning scale (Diener et al., 1995) if the length of the questionnaire is not a concern. Finally, the present study did not examine how schools and classrooms might have an effect on student engagement. With large and nationally representative samples of 15-year-old students in 43 countries, the OECD Programme for International Student Assessment (PISA) of 2000 (Wilms, 2003) found that the emotional and behavioral engagement did not vary considerably among the countries of the sample. However, student engagement varied as a function of school, showing that school ecology played an important role in student engagement. Future studies in student engagement should include schools in the purview of investigation.

Conclusions

Based on a multicultural single sample that included respondents from 12 countries, findings revealed the data to be most appropriately represented by a second-order model comprised of one higher-order factor (student engagement) and three first-order factors (affective engagement, behavioral engagement, and cognitive engagement). With the psychometric properties confirmed and preliminary evidence supporting the validity of the student engagement scale, the foundation is established for further international scholarship and practice to advance global understanding of the importance of student engagement in school around the world.

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Appendix

Student Engagement in School Items

Items	Sources
Affective engagement	
How much do you agree that the following statements accurately describe your learning experience in this semester?	
1. I am very interested in learning.	
2. I think what we are learning in school is interesting.	Rao & Sachs (1999)
3. I like what I am learning in school.	Rao & Sachs (1999)
4. I enjoy learning new things in class.	Skinner & Belmont (1993)
5. I think learning is boring. (R)	
6. I like my school.	Hill & Werner (2006)
7. I am proud to be at this school.	Hill & Werner (2006)
8. Most mornings, I look forward to going to school.	Hill & Werner (2006)
9. I am happy to be at this school.	Hill & Werner (2006)
Behavioral engagement	
How much do you agree that the following statements accurately describe your learning experience in this semester?	
1. I try hard to do well in school.	Skinner & Belmont (1993)
2. In class, I work as hard as I can.	Skinner & Belmont (1993)
3. When I'm in class, I participate in class activities.	Skinner & Belmont (1993)
4. I pay attention in class.	Skinner & Belmont (1993)
5. When I'm in class, I just act like I'm working. (R)	Skinner & Belmont (1993)
6. In school, I do just enough to get by. (R)	Skinner & Belmont (1993)
7. When I'm in class, my mind wanders. (R)	Skinner & Belmont (1993)
8. If I have trouble understanding a problem, I go over it again until I understand it.	Miller et al. (1996)
9. When I run into a difficult homework problem, I keep working at it until I think I've solved it.	Miller et al. (1996)
10. I am an active participant of school activities such as sport day and school picnic.	Finn et al. (1995)
11. I volunteer to help with school activities such as sport day and parent day.	Finn et al. (1995)
12. I take an active role in extra-curricular activities in my school.	Finn et al. (1995)
Cognitive engagement	
When learning things for school in this semester, how often do you do the following?	
1. When I study, I try to understand the material better by relating it to things I already know.	Samuelstuen & Bråten (2007)
2. When I study, I figure out how the information might be useful in the real world.	Samuelstuen & Bråten (2007)
3. When learning new information, I try to put the ideas in my own words.	Greene et al. (2004)
4. When I study, I try to connect what I am learning with my own experiences.	Wolters (2004)
5. I make up my own examples to help me understand the important concepts I learn from school.	Wolters (2004)
6. When learning things for school, I try to see how they fit together with other things I already know.	Dowson & McInerney (2004)
7. When learning things for school, I often try to associate them with what I learnt in other classes about the same or similar things.	Dowson & McInerney (2004)

(*Appendix continues*)

Appendix (*continued*)

Items	Sources
8. I try to see the similarities and differences between things I am learning for school and things I know already.	Dowson & McInerney (2004)
9. I try to understand how the things I learn in school fit together with each other.	Dowson & McInerney (2004)
10. I try to match what I already know with things I am trying to learn for school.	Dowson & McInerney (2004)
11. I try to think through topics and decide what I'm supposed to learn from them, rather than studying topics by just reading them over.	Elliot et al. (1999)
12. When studying, I try to combine different pieces of information from course material in new ways.	Greene & Miller (1996)

Note. (R) indicates reversed item. The Likert scale for the affective and engagement subscales is the followings: 1 (*strongly disagree*), 2 (*strongly agree*), 3 (*neutral*), 4 (*agree*), and 5 (*strongly agree*). The Likert scale for the cognitive engagement subscale is the followings: 1 (*never*), 2 (*rarely*), 3 (*sometimes*), 4 (*often*), and 5 (*always*).

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