

# How Students Create Motivationally Supportive Learning Environments for Themselves: The Concept of Agentic Engagement

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The present study introduced “agentic engagement” as a newly proposed student-initiated pathway to greater achievement and greater motivational support. Study 1 developed the brief, construct-congruent, and psychometrically strong Agentic Engagement Scale. Study 2 provided evidence for the scale’s construct and predictive validity, as scores correlated with measures of agentic motivation and explained independent variance in course-specific achievement not otherwise attributable to students’ behavioral, emotional, and cognitive engagement. Study 3 showed how agentially engaged students create motivationally supportive learning environments for themselves. Measures of agentic engagement and teacher-provided autonomy support were collected from 302 middle-school students in a 3-wave longitudinal research design. Multilevel structural equation modeling showed that (a) initial levels of students’ agentic engagement predicted longitudinal changes in midsemester perceived autonomy support and (b) early-semester changes in agentic engagement predicted longitudinal changes in late-semester autonomy support. Overall, these studies show how agentic engagement functions as a proactive, intentional, collaborative, and constructive student-initiated pathway to greater achievement (Study 2) and motivational support (Study 3).

*Keywords:* achievement, agency, agentic engagement, autonomy support, student engagement

Engagement refers to a student’s active involvement in a learning activity (Christenson, Reschly, & Wylie, 2012). It functions as a student-initiated pathway to highly valued educational outcomes, such as academic progress and achievement (Jang, Kim, & Reeve, 2012; Ladd & Dinella, 2009; Skinner, Kindermann, Connell, & Wellborn, 2009; Skinner, Zimmer-Gembeck, & Connell, 1998). It is a multidimensional construct consisting of three distinct, yet intercorrelated and mutually supportive, pathways to academic progress—namely, its behavioral, emotional, and cognitive aspects (Christenson et al., 2012; Fredricks, Blumenfeld, & Paris, 2004; Skinner, Kindermann, Connell, & Wellborn, 2009). Behavioral engagement refers to how involved the student is in the learning activity in terms of attention, effort, and persistence; emotional involvement refers to the presence of positive emotions during task involvement such as interest and to the absence of negative emotions such as anxiety; and cognitive engagement refers to how strategically the student attempts to learn in terms of employing sophisticated rather than superficial learning strategies, such as using elaboration rather than memorization. This three-dimensional portrayal of what actively involved students do is accurate, but it is also incomplete. Students do become behavior-

ally, emotionally, and cognitively involved in the learning activities their teachers provide (e.g., write an essay, solve a math problem), and their extent of effort, enjoyment, and strategic thinking does predict important outcomes, such as achievement. But students also do more than this. Students also, more or less, proactively contribute into the flow of instruction they receive as they attempt not only to learn but also to create a more motivationally supportive learning environment for themselves (Bandura, 2006).

## Agentic Engagement

Reeve and Tseng (2011) initially proposed the concept of agentic engagement. They defined it as “students’ constructive contribution into the flow of the instruction they receive” (p. 258). To characterize students’ agentic engagement, these researchers offered classroom-based examples such as “offer input, express a preference, offer a suggestion or contribution, ask a question, communicate what they are thinking and needing, recommend a goal or objective to be pursued, communicate their level of interest, solicit resources or learning opportunities, seek ways to add personal relevance to the lesson, ask for a say in how problems are to be solved, seek clarification, generate options, communicate likes and dislikes, . . .” (Reeve & Tseng, 2011, p. 258). These examples were extracted from extensive field notes in which trained raters used the Hit-Steer Observation System (Fiedler, 1975; Koehnigs, Fiedler, & deCharms, 1977) to typify how students proactively attempt to learn and contribute into the flow of instruction their teachers provide. From this database and from the writings of motivation theorists who described what agentially motivated students do—e.g., deCharms’s (1976) origins in the classroom, Bandura’s (1997) efficacious learners, and Ryan and

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Deci's (2000) autonomously motivated students—Reeve and Tseng (2011) operationally defined the agentic engagement construct with the following five items:

- During class, I ask questions.
- I tell my teacher what I like and what I don't like.
- I let my teacher know what I'm interested in.
- During class, I express my preferences and opinions.
- I offer suggestions about how to make the class better.

What these five acts of agentic engagement have in common is that each is a unilateral contribution into the flow of instruction. Communicating one's preferences or asking a question, however, may or may not advance one's learning or improve one's learning conditions. What would be more likely to do so would be transactional (Sameroff, 2009) or dialectical (Reeve, Deci, & Ryan, 2004) classroom activity. With transactional activity, positive student outcomes are not a function of student activity (agentic engagement) but, rather, are the result of the unfolding of reciprocal processes between student and teacher. What students do (display engagement) affects and transforms what teachers do (provide instruction) and vice versa, and it is these emerging transactions that lead to greater or lesser positive student outcomes. With dialectical activity, student-initiated questions and communications affect change in and transform the teacher's instructional behavior, just as the teacher's instructional behavior in turn affects change in and transforms the quality and quantity of the student's engagement. Hence, agentic engagement can be viewed not just as a student's contributions into the flow of instruction but also as an ongoing series of dialectical transactions between student and teacher.

How agentially engaged students contribute transactionally and dialectically into the instructional flow is illustrated graphically in Figure 1. The four horizontal lines communicate that (a) student engagement emerges out of and publically expresses the quality of

students' underlying motivation and (b) students attain learning-related outcomes in proportion to which they exert effort, experience enthusiasm, think strategically, and contribute constructively. What all four horizontal lines have in common is that they represent naturally occurring expressions of students' underlying academic motivation that functionally translate students' academic motivation into positive educational outcomes. Of particular importance is the addition of the fourth horizontal line to communicate that agentic engagement explains unique variance in students' learning and achievement. The curved line in the lower portion of the figure communicates a unique property of agentic engagement—namely, that, through their acts of agentic engagement, students—more or less—attempt to join forces with the provider of the learning environment (i.e., the teacher) to create for themselves a more motivationally supportive learning environment. These acts of agentic engagement are qualitatively distinct from the other three aspects of engagement in that they are intentional, proactive, and teacher-collaborative ways of engaging in learning activities. If these agentic contributions do transform how motivationally supportive the learning environment becomes (e.g., greater autonomy support, greater access to interesting and personally valued learning activities), then the learning environment becomes increasingly conducive to the types of student motivation (i.e., origin motivation, autonomous motivation, academic efficacy) capable of energizing, directing, and sustaining students' classroom engagement.

### Agentic Engagement as a New Educational Construct

Engagement represents the range of action students take to advance from not knowing, not understanding, not having skill, and not achieving to knowing, understanding, having skill, and achieving. It is what students do to make academic progress. To

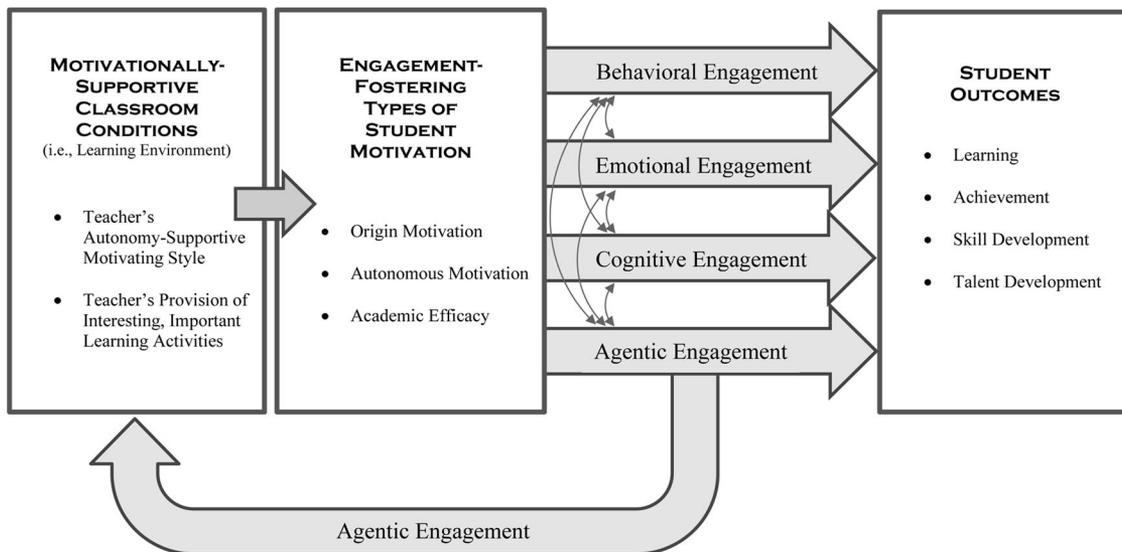


Figure 1. Four interrelated aspects of student engagement that explain students' positive outcomes (four horizontal lines) plus agentic engagement's unique contribution to constructive changes in the learning environment (curved line at the base of the figure). The six curved lines with double-sided arrows communicate the positive intercorrelations among the four aspects of engagement.

make progress in learning a foreign language, for instance, students can pay close attention to sources of information, invest effort, and persist in the face of setbacks, which is behavioral engagement. Or, they can enhance their curiosity and minimize their anxiety and frustration, which is emotional engagement. Or, students can apply sophisticated learning strategies and carry out mental simulations to diagnose and solve problems, which is cognitive engagement. These are three empirically validated pathways to academic progress (Christenson et al., 2012). But agentic engagement is a fourth pathway. Proactively, students can contribute into the flow of instruction both to enhance their learning and to negotiate for the interpersonal support they need to energize their task-related motivation. To do so, they can express their preferences, ask questions, and let the teacher know what they need, want, and are interested in. The acknowledgment of this breadth of engagement activity expands the current three-aspect conceptualization of student engagement into a four-aspect conceptualization, as represented in Figure 1.

Agentic engagement is similar to the other three aspects of engagement, as it too is a constructive student-initiated pathway to academic progress; but it is also meaningfully different. Conceptually, agentic engagement is a uniquely proactive and transactional type of engagement. Proactively, agentic engagement students take action before the learning activity begins (e.g., “Teacher, can we do  $x$ ?”); transactionally, they negotiate for a more motivationally supportive learning environment (e.g., how challenging, personally relevant, need-satisfying, or goal-congruent the learning activity is). The other three types of engagement largely take the teacher’s instruction as it is given, as students use their behavior, emotion, and cognition as ways of translating that teacher-provided instruction into student-acquired knowledge, understanding, and skill. Empirically, agentic engagement has been shown (a) to correlate only modestly with the other three aspects of engagement and (b) to explain unique variance in students’ positive outcomes that the other three aspects cannot explain (Reeve & Tseng, 2011). That is, agentic engagement students are taking achievement-fostering action that is something more than just their behavioral, emotional, and cognitive engagements.

Agentic engagement is also meaningfully different from other proactive, collaborative, and constructive classroom events. For instance, formative assessments and personal response systems (“clickers”) are collaborative, constructive, and sometimes proactive approaches to instruction that facilitate learning, but they represent teacher-initiated, rather than student-initiated, action. A teacher’s instructional effort to design and implement a constructivist learning environment also fits within this category of teacher-initiated action (Brown & Campione, 1996). Instrumental (or “adaptive”) help-seeking is student-initiated and collaborative, but it is not necessarily either proactive or constructive (i.e., it generally does not correlate with student achievement; Pajares, Cheong, & Oberman, 2004). Self-regulated learning involves student-initiated, proactive, intentional, and constructive regulatory processes and actions (Zimmerman & Schunk, 2011), but existing theoretical frameworks do not yet incorporate the concept of agentic engagement into their conceptualization of how students actively involve themselves in learning activities (as will be elaborated on in the General Discussion). Agentic engagement is the

classroom concept that best captures student-initiated, proactive, intentional, collaborative, and constructive action.

Agentic engagement is not only a pathway to academic progress, but it is also a student-initiated pathway to a more motivationally supportive learning environment. There is some evidence that students’ behavioral engagement also pulls a more supportive style out of teachers and that students’ behavioral disengagement pulls out a more conflictual or controlling style (Pelletier, Seguin-Levesque, & Legault, 2002; Skinner & Belmont, 1993), although we can find no evidence that emotional or cognitive engagement pulls a more supportive style out of teachers. This behavioral engagement effect on teachers’ motivating styles is, however, an indirect or inadvertent (albeit fortuitous) effect. In their reasoning as to why teachers respond to students’ behavioral engagement, Skinner and Belmont (1993) argued that teachers find students’ behavioral disengagement to be aversive and that this leads teachers to feel incompetent or unliked by their students. As a result, teachers tend to offer less support to these students. Behavioral disengagement also signals poor student motivation, and teachers sometimes seek to remediate such low motivation by applying pressure and coercion to motivate the unmotivated. Thus, behaviorally engaged students may not intentionally recruit their teachers’ autonomy support any more than behaviorally disengaged students intentionally recruit teachers’ control and coercion. In contrast, agentic engagement is intentional, purposive student-initiated action to render the learning environment to become more motivationally supportive.

### Purpose of the Investigation and Overview of the Three Studies

The purpose of the present investigation was to introduce agentic engagement as a newly proposed student-initiated pathway to academic success, defined in the present study as the two-fold student outcome of higher achievement and greater motivational support. Before we could investigate the utility of this pathway, we found it necessary to expand the instrument designed to assess agentic engagement—the Agentic Engagement Scale (AES)<sup>1</sup>—to consider not only unilateral contributions into instruction but also more transactional and dialectical contributions. While Study 1 sought to refine the AES into a brief, construct-congruent, and psychometrically strong self-report questionnaire, Study 2 sought to validate that refined scale. Using the criteria introduced by Reeve and Tseng (2011), a valid agentic engagement scale should do five things: (a) correlate positively with agency-rich types of students’ classroom motivation; (b) correlate negatively with agency-impoverished types of motivation; (c) be distinct from the other three aspects of engagement; (d) predict independent (i.e., unique) variance in course-related achievement (after controlling for the variance in achievement otherwise attributable to behavioral, emotional, and cognitive engagement); and (e) predict the extent to which students create a more motivationally supportive learning environment for themselves. The fourth and fifth criteria

<sup>1</sup> The name of the original scale was changed from the “Agentic Engagement Questionnaire” to the “Agentic Engagement Scale” to avoid potential confusion that the AEQ acronym might have with the widely-used “Achievement Emotions Questionnaire” (Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011).

were considered centrally important to the present study because their confirmation would validate agentic engagement as an additionally important student-initiated pathway to positive outcomes (i.e., greater achievement, greater motivational support).

### Study 1

In Study 1 we sought to operationally define the agentic engagement construct through the refinement of its measurement instrument. The methodological strategy was to start with [Reeve and Tseng's \(2011\)](#) original five items and test the merits of adding both new and revised construct-consistent candidate items that reflected not just students' unilateral contributions (as with the original items) but transactional and dialectical ones as well. As before, the source of material to create the new candidate items came from extensive classroom field notes from observations of what middle- and high-school students say and do during instruction. Two key inclusion criteria were established for the Study 1 scale development process: (a) The candidate item must correlate significantly with students' agency-centric motivational status, and (b) the candidate item must not be so highly correlated with the other three aspects of engagement (behavioral, emotional, and cognitive) as to be confounded with them. The first criterion—one of construct validity—is important to confirm that the candidate item was closely associated with the types of motivation that the original theoretical work on agentic engagement cited as its motivational origins, including psychological need satisfaction ([Ryan & Deci, 2000](#)) and self-efficacy ([Bandura, 1997](#)). These motivations are agency-centric in that they both energize proactive and intentional (i.e., agentic) changes on the learning environment ([Bandura, 2006](#); [Deci & Ryan, 1985](#)). The second criterion—one of divergent (or discriminant) validity—is important to confirm that the candidate item assesses a uniquely distinct type of engagement.

### Method

**Participants and procedure.** Participants were 271 (48 female, 222 male, 1 unknown) college students from one of six different courses within the College of Engineering at a large university in Incheon, South Korea. All students (and their teachers) were ethnic Korean. These particular students were selected because the School of Engineering was considering a curricular program change to move classroom instruction away from traditional lecture to more student-centered approaches, such as personal projects, which prompted school administrators' interest in collecting data on their students' existing motivation and engagement profiles. Participation in the study was voluntary, and participants were told by the research assistant who administered the questionnaire that their scores were confidential and anonymous. Students who consented to participate completed the survey at the beginning of a class period midway through the semester. The survey took 5–10 min to complete, and participants were asked to rate their experiences of motivation and engagement in reference to the specific course in which they completed the questionnaire.

**Measures.** Each measure (other than the newly created AES candidate items) was a Korean-translated version of a widely used and previously validated questionnaire that had been used successfully with previous Korean samples. Each questionnaire used a 1–7

Likert-type scale with the following response options: 1 = *strongly disagree*; 2 = *disagree*; 3 = *slightly disagree*; 4 = *neither agree nor disagree*; 5 = *slightly agree*; 6 = *agree*; and 7 = *strongly agree*.

**Motivation.** Two questionnaires assessed students' agentic-centric motivational status. To assess *psychological need satisfaction*, we used the Activity-Feelings States (AFS; [Reeve & Sicklenius, 1994](#)). The AFS offered the stem, "During this class, I feel," and listed four items to assess perceived autonomy (e.g., "free"), three items to assess perceived competence (e.g., "capable"), and three items to assess perceived relatedness (e.g., "I belong and the people here care about me"). The overall 10-item assessment showed acceptable reliability ( $\alpha = .83$ ). We used this particular measure of psychological need satisfaction because it was used in the [Reeve and Tseng \(2011\)](#) investigation and because it had been shown to produce scores capable of predicting students' classroom engagement and course grades ([Jang, Reeve, Ryan, & Kim, 2009](#); [Reeve, Nix, & Hamm, 2003](#)). To assess *self-efficacy*, we used the academic efficacy scale from the Patterns of Adaptive Learning Scales ([Midgley et al., 2000](#)). The academic efficacy scale included five items (e.g., "I'm certain I can master the skills taught in this class this year") and showed an acceptable reliability ( $\alpha = .88$ ). We used this particular measure to expand the conceptualization of agentic motivation beyond just psychological need satisfaction to include academic efficacy and because it had been shown to produce scores capable of predicting students' classroom engagement and course grades ([Linnenbrink, 2005](#); [Midgley et al., 2000](#)).

**Engagement.** We assessed four aspects of student engagement—agentic, behavioral, emotional, and cognitive. To assess *agentic engagement*, we used the five original items from the [Reeve and Tseng \(2011\)](#) measure and then created five new candidate items. These 10 items appear in [Table 1](#). Items 1–5 are the original AES items. Item 1b is a revised version of original Item 1; this item was revised to test the merit of limiting the context of question-asking to that which is specific to learning. Items 6 and 7 represented two new candidate items designed to assess a proactive and transactional contribution into the learning environment. Items 8 and 9 represent two new candidate items designed to assess a personal contribution to one's own learning that was not necessarily interpersonal, transactional, or dialectical but would instead apply during work on a personal project, homework assignment, or independent work. The psychometric properties associated with these items and the scale that emerged from these items will be presented in the Results.

To assess both *behavioral engagement* and *emotional engagement*, we used the behavioral engagement and emotional engagement scales from the Engagement Versus Disaffection with Learning measure ([Skinner, Kindermann, & Furrer, 2009](#)). The behavioral engagement scale included five items (listed in [Table 2](#)), and it showed acceptable internal consistency ( $\alpha = .86$ ). The emotional engagement scale included five items (listed in [Table 2](#)), and it too showed acceptable internal consistency ( $\alpha = .90$ ). We used these particular scales because both have been shown to produce scores that predict important student outcomes, including course grades ([Skinner & Belmont, 1993](#); [Skinner, Kindermann, & Furrer, 2009](#)). To assess *cognitive engagement*, we used the learning strategy items from the

Table 1  
Correlations for All 10 Candidate Items With Two Measures of Agentic Motivation, Study 1

Item	Psychological need satisfaction	Academic efficacy
Original items to assess a unilateral contribution to the learning environment		
1. <i>During class, I ask questions.</i>	.39**	.39**
1b. Revised version: During class, I ask questions to help me learn.	.48**	.63**
2. <i>I tell the teacher what I like and what I don't like.</i>	.27**	.22**
3. I let my teacher know what I'm interested in.	.36**	.36**
4. <i>I offer suggestions about how to make the class better.</i>	.29**	.27**
5. During this class, I express my preferences and opinions.	.45**	.40**
New candidate items to assess a transactional contribution to the learning environment		
6. I let my teacher know what I need and want.	.36**	.32**
7. When I need something in this class, I'll ask the teacher for it.	.36**	.44**
New candidate items to assess a personal contribution to one's own learning		
8. I try to make whatever we are learning as interesting as possible.	.55**	.57**
9. I adjust whatever we are learning so I can learn as much as possible.	.51**	.57**

Note.  $N = 271$ . Items deleted from further consideration appear in *italicized* type.

\*\*  $p < .01$ .

Metacognitive Strategies Questionnaire (Wolters, 2004). The scale featured four items (listed in Table 2), and it showed acceptable internal consistency ( $\alpha = .84$ ). We used this particular scale because it conceptualized cognitive engagement as strategic learning (e.g., using elaboration-based learning strategies) and because it had been shown to predict course grades (Reeve & Tseng, 2011; Wolters, 2004).

## Results

For each of the 10 candidate agentic engagement items, Table 1 displays its correlations with psychological need satisfaction and academic efficacy. Item 1 correlated well with both indicators of agentic motivation, but its revised version correlated noticeably better with academic efficacy ( $r_s = .63$  vs.  $.39$ ,  $z = 3.82$ ,  $p < .01$ ). Revised Item 1b was therefore preferred over original Item 1, because it was more closely associated with agentic motivation. Items 2 and 4 failed to correlate with either psychological need satisfaction or academic efficacy above a threshold of 10% shared variance ( $r = .34$ ; or  $R^2 > .10$ ), whereas all six remaining candidate items did. From these correlations and from the need to test candidate items from all three categories of agentic engagement (i.e., unilateral, transactional, and personal contributions), we retained Items 1b, 3, 5, 6, 7, 8, and 9 for further analyses while we removed Items 1, 2, and 4 for further consideration.

We next performed an exploratory factor analysis (EFA) on the seven retained agentic engagement candidate items, the five behavioral engagement items, the five emotional engagement items, and the four cognitive engagement items. The four-factor solution (based on eigenvalues  $\geq 1$ ) using principal axis factoring with oblique rotation appears in Table 2. Of central importance was whether the seven candidate items would load on their own separate (i.e., distinct) factor. Five candidate items did load separately (on Factor 2), but the two new candidate items designed to assess a personal contribution unexpectedly loaded on the factor defined by the cognitive engagement items. Because the purpose of the factor analysis was to identify only

candidate items that were distinct from the other three aspects of engagement, these two items were considered to be unduly confounded with cognitive engagement and were therefore removed.

The five items retained for the refined AES appear in Table 3. The table provides the descriptive statistics associated with each individual item and with the five-item scale as a whole. Table 3 provides the statistics associated with the samples utilized in Studies 2 and 3 as well.

## Discussion

The result of applying the construct and discriminant (or factorial) validity criteria to the 10 candidate items was the five-item AES listed in Table 3. Overall, the refined scale showed strong internal consistency and produced a normal distribution of scores (see Table 3). An important question to answer from Study 1 was whether the revised scale was superior to the original scale. The revised scale represents a conceptually and psychometrically stronger instrument in four ways. First, Item 1 was strengthened to restrict question-asking only to questions specifically related to learning. Second, two new items were added to represent students' transactional (as well as proactive) contributions into the learning environment. The addition of these two items (Items 1 and 3) allowed the AES to better align with the conceptual definition of the construct (that emphasized transactional contributions). Third, the two original items that correlated only weakly with agentic-centric motivations were removed. Fourth, the two candidate items designed to represent a personal contribution were not retained. While both items strongly correlated with agentic-centric sources of motivation, their high factor loadings on the cognitive engagement factor suggested that they expressed cognitive engagement at least as much as they expressed agentic engagement, and actually more so.

From the data obtained in Study 1, we conclude that the AES is a psychometrically sound scale—a measure that is internally consistent, closely aligned with agentic-centric sources of mo-

Table 2

*Factor Loadings From an Exploratory Factor Analysis Using Principal Axis Factoring With Oblique Rotation for the 21 Items Assessing the Four Aspects of Student Engagement, Study 1*

Questionnaire item/factor intercorrelations	Factor 1 (47.6%)	Factor 2 (10.3%)	Factor 3 (8.3%)	Factor 4 (4.6%)
<b>Behavioral Engagement items</b>				
When I'm in this class, I listen very carefully.	.86			
I pay attention in this class.	.82			
I try hard to do well in this class.	.59			
In this class, I work as hard as I can.	.57			
When I'm in this class, I participate in class discussions.	.35	.36		
<b>Agentic Engagement (candidate) items</b>				
I let my teacher know what I need and want.		.79		
I let my teacher know what I am interested in.		.78		
During this class, I express my preferences and opinions.		.78		
During class, I ask questions to help me learn.		.56		
When I need something in this class, I'll ask the teacher for it.		.51		
I adjust whatever we are learning so I can learn as much as possible.			-.67	
I try to make whatever we are learning as interesting as possible.			-.55	
<b>Cognitive Engagement items</b>				
When I study for this class, I try to connect what I am learning with my own experiences.			-.92	
I try to make all the different ideas fit together and make sense when I study for this class.			-.86	
When doing work for this class, I try to relate what I'm learning to what I already know.			-.65	
I make up my own examples to help me understand the important concept I study for this class.			-.59	
<b>Emotional Engagement items</b>				
When we work on something in this class, I feel interested.				-.86
This class is fun.				-.81
I enjoy learning new things in this class.				-.75
When I'm in this class, I feel good.				-.68
When we work on something in this class, I get involved.	.52			
<b>Factor intercorrelations</b>				
Factor 1: Behavioral Engagement	—	.32	-.45	-.67
Factor 2: Agentic Engagement		—	-.44	-.44
Factor 3: Cognitive Engagement			—	.56
Factor 4: Emotional Engagement				—

Note. Factor loadings < .30 are not shown.

tivation, and meaningfully distinct from the other three aspects of engagement. Still, it is not yet clear if scores produced by the AES will correlate negatively with agency-impooverished aspects of motivation, will explain independent variance in student achievement (i.e., horizontal line in Figure 1), and will explain student-initiated constructive changes in the learning environment (i.e., curved line in Figure 1)—questions to be addressed in Studies 2 and 3.

## Study 2

While the purpose of Study 1 was to refine the AES at the item level, Study 2 sought to validate the scale as a whole. To do so, we employed a three-part strategy. First, in a test of the scale's construct validity, we correlated participants' scores on the AES with their reports of autonomous and controlled motivation. In their self-determination theory, Ryan and Deci (2000, 2002) conceptualized autonomous motivation as an agentic-laden type of motivation that consists of both intrinsic motivation (e.g., motivated proactively by interest) and identified regulation (motivated proactively by value) while they conceptualized controlled motivation as an agentic-impooverished type of motivation that consists of both introjected regulation (motivated reactively by internal pressure) and

external regulation (motivated reactively by environmental contingencies). By focusing on this distinction, the goal was to establish discriminant validity in that we expected agentic engagement scores to correlate positively with autonomous motivation but negatively with controlled motivation.

Second, in a test of the scale's discriminant validity, we followed-up Study 1's EFA with a confirmatory factor analysis (CFA) in Study 2. In the CFA, we included items to represent behavioral, emotional, cognitive, and agentic engagement and hypothesized that a corresponding four-factor model would fit the data well (with no cross-loadings and no correlated errors).

Third, in a test of the scale's predictive validity, we predicted that scores produced by the AES would explain independent variance in students' course achievement even after controlling for students' behavioral, emotional, and cognitive engagements. This test of the scale's unique predictive validity is important because there are two essential criterion-related rationales to justify the need to add agentic engagement as a new fourth aspect of engagement. First, agentic engagement can explain unique variance in student achievement. This is a first test of the unique predictive validity of the AES, and it constituted the primary purpose of Study 2. Second, agentic engagement can predict constructive changes in the learning environment. This is a second test of the

Table 3  
Descriptive Statistics for Each Individual AES Item and for the AES Scale as a Whole Across Studies 1, 2, and 3

Variable	Study 1		Study 2		Study 3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Individual AES item						
1. I let my teacher know what I need and want.	2.83	1.29	2.80	1.00	3.96	1.53
2. During this class, I express my preferences and opinions.	3.37	1.47	2.61	0.98	4.65	1.29
3. When I need something in this class, I'll ask the teacher for it.	3.75	1.49	3.52	1.03	4.61	1.22
4. During class, I ask questions to help me learn.	4.03	1.42	2.91	1.05	4.11	1.46
5. I let my teacher know what I am interested in.	2.79	1.39	3.54	0.86	4.01	1.44
Overall 5-item AES score						
Range	1–7		1–5		1–7	
<i>M</i>	3.35		3.08		4.17	
<i>SD</i>	1.13		0.71		1.09	
$\alpha$	.86		.84		.81	
Skewness ( $m^3$ )	0.47		0.15		0.36	
Kurtosis ( $m^4$ )	0.31		–0.18		0.03	
<i>t</i> test for gender differences (1 = female; 2 = male)	1.78, $p < .08$		1.81, $p < .08$		0.02, <i>ns</i>	
Sample	271 university engineering majors from 6 classes		248 university education majors from 4 classes		302 middle-school physical education students (at Time 2) from 9 classes	

Note. AES = Agentic Engagement Scale.

unique predictive validity of the AES, and it constituted the purpose of Study 3.

## Method

**Participants and procedure.** Participants were 248 (132 female, 116 male) college students from a large university in Seoul, South Korea who were taking one of four different sections of the same course in the Department of Education. All students (and their teachers) were ethnic Korean. Participation in the study was voluntary, and participants were told by the research assistant who administered the questionnaire that their scores were confidential and anonymous. Students who consented to participate completed the survey at the beginning of one class midway through the semester, while the achievement data (course grades) were collected at the end of the semester. The survey took 5–10 min to complete, and participants were asked to rate their experiences of motivation and engagement in reference to the specific course in which they completed the questionnaire.

**Measures.** As in Study 1, each measure came from a previously validated and widely used questionnaire that had been previously translated and successfully used in Korean. Each questionnaire used a 1–5 Likert-type scale with the following response options: 1 = *strongly disagree*; 2 = *disagree*; 3 = *neither agree nor disagree*; 4 = *agree*; and 5 = *strongly agree*.

**Motivation.** To report their class-specific motivation, participants completed the Academic Self-Regulation Questionnaire (ASRQ; Ryan & Connell, 1989). The ASRQ features the stem “I do my classwork . . .” followed by 16 items to assess four aspects of student motivation that lie along a continuum from highly autonomous to highly controlled motivation. Two scales—*intrinsic motivation* and *identified regulation*—are conceptualized as autonomous and proactive types of motivation, and two scales—*introjected regulation* and *external regulation*—are conceptualized as controlled and reactive types of motivation. Four items assessed

course-related intrinsic motivation (e.g., “because it’s fun”), and four items assessed identified regulation (e.g., “because it is something that is personally important to me”). To create a single index of autonomous motivation, we followed the tradition established within this area of research (e.g., Williams, Grow, Freedman, Ryan, & Deci, 1996) and combined these eight items into a single autonomous motivation score ( $\alpha = .84$ ). Four items assessed course-related introjected regulation (e.g., “because I’ll feel bad about myself if I don’t”), and four items assessed external regulation (e.g., “because I’ll get in trouble if I don’t”). To create a single index of controlled motivation, we again followed the tradition within this literature and combined these eight items into a single controlled motivation score ( $\alpha = .76$ ). As expected, the two measures were moderately negatively correlated,  $r(248) = -.31, p < .01$ .

**Engagement.** To assess agentic engagement, we used the five-item scale developed in Study 1 (see Table 3). In Study 2, the AES showed an acceptable level of internal consistency ( $\alpha = .84$ ). To assess the behavioral, emotional, and cognitive aspects of engagement, we used the same three questionnaires from Study 1 (see the items listed in Table 2)—with two exceptions. Because it loaded poorly as a behavioral engagement item in the Study 1 factor analysis (see Table 2), we excluded behavioral engagement Item 5 (“When I’m in this class, I participate in class discussions.”) from Study 2. And, because it loaded poorly as an emotional engagement item, we excluded emotional engagement Item 5 (“When we work on something in this class, I get involved.”). All three measures showed acceptable levels of internal consistency in Study 2, including behavioral engagement (four-items,  $\alpha = .87$ ), emotional engagement (four-items,  $\alpha = .91$ ), and cognitive engagement (four-items,  $\alpha = .72$ ).

**Achievement.** For course-specific achievement, we collected each student’s final semester grade from the objective school record for the particular class in which he or she completed the

questionnaires. Course achievement scores were reported on a 0–100 point scale.

**Data analysis.** The hypothesized measurement model to test the scale's discriminant validity assessed behavioral, emotional, cognitive, and agentic engagement as latent variables. To assess behavioral, emotional, and cognitive engagement, we used the four items from their respective scales as observed indicators, and for agentic engagement we used the five items from the AES as observed indicators. The measurement model therefore included 17 indicators for four latent variables. The hypothesized structural model to test the scale's predictive validity used these same 17 indicators and four latent variables but also added student gender as a single-indicator predictor variable and course grade as a single-indicator of the achievement outcome. To prepare these two models for statistical testing, we first calculated multilevel analyses using hierarchical linear modeling (HLM, Version 7; Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011) to determine whether between-teacher differences affected students' self-reports and course grades. The percentage of variance attributable to between-teacher differences determined from unconditional models exceeded 10% for two of the 18 measured variables, and the mean intraclass correlation (ICC) across the 18 measured variables was 5.9%. The ICCs associated with the 17 engagement indicators appear in the right most column of Table 4 (the ICC for the 18th indicator, course grade, was 0.4%). Given the meaningful between-teacher effects on some of the assessed measures, we chose to use multilevel structural equation modeling (LISREL 8.8; Jöreskog & Sörbom, 1996) in the test of both the hypothesized measurement model (the CFA) and the hypothesized structural model (to predict achievement). In the conduct of the multilevel HLM analyses, we used maximum-likelihood estimation. By using multilevel modeling, the results may be interpreted as student-level results ( $n = 248$ ) that are statistically independent of any teacher-level effects within the data. Unfortunately, the low number of teachers/classrooms ( $k = 4$ ) prevented us from analyzing these data at the teacher level. To evaluate model fit we relied on the chi-square test statistic and multiple indices of fit (as recommended by Kline, 2011), including the root-mean-square error of approximation (RMSEA), the standardized root-mean-square residual (SRMR), the comparative fit index (CFI), and the non-normed fit index (NNFI).<sup>2</sup>

## Results

**Construct validity.** The five-item AES correlated positively and significantly with the measure of autonomous motivation,  $r(248) = .44, p < .01$ , and negatively and significantly with controlled motivation,  $r(248) = -.14, p < .05$ . These correlations appear above the diagonal in Table 5 in rows 1 and 2. As can be seen from these correlations, the positive correlation between autonomous motivation and agentic engagement and the negative correlation between controlled motivation and agentic engagement were similarly true for the other three aspects of engagement. Thus engagement in general—rather than agentic engagement in particular—was associated positively with autonomous motivation and negatively with controlled motivation.

**Discriminant validity.** We calculated a multilevel confirmatory factor analysis (CFA) to assess how well the 17 items assessing the different aspects of engagement fit to a four-factor model.

The hypothesized 17-item, four-factor model fit the data well,  $\chi^2(266) = 360.61, p < .01$ , RMSEA (90% confidence interval [CI]) = .076 (.065–.088), SRMR = .069, CFI = 0.98, NNFI = 0.98, and all five agentic engagement items loaded positively and highly ( $p < .001$ ) on the latent factor. In the CFA, we included no cross-loadings and no correlated error terms. The standardized and unstandardized beta weights associated with all 17 indicators included in this analysis appear in Table 4.<sup>3</sup>

**Unique predictive validity.** To test the unique predictive validity of the AES, we tested whether each aspect of engagement could serve as an independent predictor of student achievement (i.e., final course grade). The test of the 17-item, four-factor model in the preceding discriminant validity analysis confirmed the fit of the underlying measurement model. To create the structural (i.e., hypothesized) model, we simply added gender to serve as a single-item predictor (a statistical control) and course grade to serve as the single indicator for the achievement outcome. The intercorrelations among the four aspects of engagement (as latent variables) and course achievement appear below the diagonal in Table 5. Each latent variable correlated significantly with course achievement ( $r$ s ranged from .21 to .42,  $p$ s  $< .01$ ). Gender did not correlate with any of the four engagement latent variables, but it did correlate with achievement ( $r = .16, p < .01$ ); as females had somewhat higher course grades than did males), so we included gender as a fifth predictor to function as a statistical control (male = 1, female = 2). The hypothesized structural model fit the data well,  $\chi^2(327) = 436.36, p < .01$ , RMSEA (90% CI) = .074 (.063–.085), SRMR = .068, CFI = .98, NNFI = .98. Collectively, the four aspects of engagement (and gender) explained 25% of the variance in course achievement. Only two of the hypothesized paths were individually significant, however, as behavioral engagement (beta = .28,  $t = 2.80, p < .01$ ) and agentic engagement (beta = .25,  $t = 3.20, p < .01$ ) individually predicted achievement while this was not true for either emotional engagement (beta = .07,  $t = 0.87, ns$ ) or cognitive engagement (beta =  $-.06, t = 0.75, ns$ ). Gender also significantly predicted achievement. The diagram showing these standardized parameter estimates appears in Figure 2.

## Discussion

In this second data set, the overall five-item AES showed strong internal consistency, produced a normal distribution of scores, was associated positively with autonomous motivation, was associated negatively with controlled motivation, and explained independent variance in student achievement that the other three aspects of engagement were unable to explain. These data suggest that the

<sup>2</sup> RMSEA and RMSR values of .08 or less indicate good fit, at least as long as the upper bound of the RMSEA's 90% confidence interval is  $\leq .10$  (Hu & Bentler, 1999; Kline, 2011); CFI and NNFI values of .95 or greater indicate good fit, at least as long as these values co-occur with a SRMR value of  $\leq .08$  (Hu & Bentler, 1999; Kline, 2011).

<sup>3</sup> AES Item 3 had a noticeably low factor loading of  $\beta = .30$ . This same item did not have a low factor loading in the data sets from Studies 1 and 3, however. Item 3 had a low factor loading in the Study 2 data set because this item also had a very high ICC of 38.6%. A close inspection of students' responses on this item showed that scores were heavily skewed by one particular teacher/class, as students in one class reported substantially higher scores on this item than did students from the other three classes.

Table 4  
*Unstandardized and Standardized Beta Weights and Interclass Correlation Coefficients Associated With All 17 Observed Indicators Within the Measurement Model, Study 2*

Observed variable	<i>B</i>	<i>SE B</i>	$\beta$	ICC (%)
Latent factor including the Behavioral Engagement items				
When I'm in this class, I listen very carefully.	.98	.06	.87	4.3
I pay attention in this class.	1.00		.89	4.8
I try hard to do well in this class.	.79	.06	.70	3.0
In this class, I work as hard as I can.	.77	.06	.68	2.1
Latent factor including the Agentic Engagement items				
I let my teacher know what I need and want.	.92	.07	.80	6.9
I let my teacher know what I am interested in.	1.00		.87	1.5
During this class, I express my preferences and opinions.	.34	.07	.30	38.6
During class, I ask questions to help me learn.	.65	.07	.57	17.4
When I need something in this class, I'll ask the teacher for it.	.73	.07	.64	8.2
Latent factor including the Cognitive Engagement items				
When I study for this class, I try to connect what I am learning . . .	.93	.11	.66	3.1
I try to make all the different ideas fit together and make sense . . .	1.00		.71	2.5
When doing work for this class, I try to relate what I'm learning . . .	.92	.11	.65	3.3
I make up my own examples to help me understand the concept . . .	.67	.11	.48	3.2
Latent factor including the Emotional Engagement items				
When we work on something in this class, I feel interested.	.96	.05	.88	2.7
This class is fun.	.91	.05	.84	1.0
I enjoy learning new things in this class.	1.00		.92	0.6
When I'm in this class, I feel good.	.84	.05	.76	2.7

Note. ICC = interclass correlation coefficient.

AES is a reliable and valid scale, but they do not speak to the crucial and as yet unexplored question of whether scores on the AES can predict student-initiated constructive changes in the learning environment. Accordingly, Study 3 was designed to test this prediction. In doing so, Study 3 deliberately sampled middle-school students, because the first two data sets used college students. By sampling middle-school students, we returned to the type of sample from which the AES item content originated (i.e., field notes from middle- and high-school classrooms using the Hit-Steer Observation System). We also wanted assurance that the findings in Studies 1 and 2 were not limited to the engagement dynamics of college classrooms but could also be extended to the engagement dynamics of middle-school classrooms.

### Study 3

If agentic engagement allows students to create more motivationally supportive learning environments for themselves, then students who begin a class with high levels of agentic engagement should experience a corresponding constructive change in their classroom learning environment over the course of the semester. This change should occur as students act agentially during instruction—as they express their preferences and interests, ask questions, and communicate what they want and need. To test this hypothesis, we assessed students' perceptions of teacher-provided autonomy support at the beginning, middle, and end of an 18-week semester. The first prediction was that early-semester agentic engagement would longitudinally predict midsemester changes in perceived teacher autonomy-support (after controlling for early-semester perceived autonomy support). In addition, we expected that students who experience increased agentic engagement during the course would experience a corresponding constructive change in their learning environment. The second prediction was therefore

that early-semester changes in agentic engagement would longitudinally predict late-semester changes in perceived teacher autonomy-support (after controlling for both initial and midsemester perceived autonomy support).

### Method

**Participants and procedure.** Participants who consented to participate were 315 middle-school students (146 female, 169 male) from nine physical education (PE) classes situated in nine different schools in the Seoul, Korea metropolitan area. All students (and their teachers) were ethnic Korean. Class sizes averaged 35.0 students per class (range = 31 to 38). Students attended their PE class each day, and each class lasted 55 min.

Participants completed a brief questionnaire three times during the semester—2 weeks into the semester (T1), a week after the midterm exam (T2), and the next-to-last week of the semester (T3). The T1 questionnaire assessed students' demographic information, class-specific agentic engagement, and perceptions of teacher-provided autonomy support; the T2 questionnaire assessed students' agentic engagement and perceived autonomy support; and the T3 questionnaire assessed only perceived autonomy support. The research assistant who administered the questionnaire told participants that their responses would be confidential, anonymous, and used only for purposes of the research study. Three hundred fifteen (315) students agreed to complete the questionnaire at T1, while only 308 of these same students agreed to complete the questionnaire at T2. The loss of seven students at T2 represented a dropout rate of 2.2%. T2 persisters did not differ from dropouts on either T1 agentic engagement or T1 perceived autonomy support ( $t_s < 1$ ). Three hundred two (302) students, including 139 females and 163 males, agreed to complete the questionnaire at all three time points. The loss of an additional 6

Table 5

*Descriptive Statistics and Intercorrelations Among the Observed Variables (Above the Diagonal) and Latent Variables (Below the Diagonal), Study 2*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Autonomous Motivation	3.55	0.62	—	-.31**	.44**	.52**	.69**	.53**	.26**	-.01
2. Controlled Motivation	2.53	0.80		—	-.14*	-.12	-.30**	-.17**	-.03	.05
3. Agentic Engagement	3.08	0.71			—	.49**	.41**	.47**	.32**	-.12
4. Behavioral Engagement	3.58	0.75				—	.58**	.30**	.40**	.01
5. Emotional Engagement	3.86	0.75					—	.40**	.30**	.01
6. Cognitive Engagement	3.72	0.66						—	.21**	-.05
7. Academic Achievement	76.9	15.3							—	.17**
8. Gender (Male = 1, Female = 2)	1.53	0.50								—

*Note.*  $N = 248$ . Possible range for all variables = 1–5, except for academic achievement, which ranged from 0 to 100. Descriptive statistics and the correlations above the diagonal are for observed (measured) variables; correlations below the diagonal listed in *italics* are for latent variables.

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

students at T3 represented an overall study-wide dropout rate of 4.1% (13/315), or a retention rate of 95.9% (302/315). The six T3 dropouts did differ from the 302 T3 persisters on T1 and T2 perceived autonomy support ( $ps < .01$ ) and on T1 agentic engagement ( $p < .01$ ), but not on T2 agentic engagement. These data suggest that while the sample loss at T2 did not bias the analyzed sample, the sample loss at T3 did in that it somewhat underrepresented initially agentic disengaged students who reported low autonomy support.

**Measures.** The questionnaires to assess students' agentic engagement and perceived autonomy support used a 1–7 Likert-type scale with the following response options: 1 = *strongly disagree*; 2 = *disagree*; 3 = *slightly disagree*; 4 = *neither agree nor disagree*; 5 = *slightly agree*; 6 = *agree*; and 7 = *strongly agree*.

**Agentic engagement.** To assess agentic engagement, we used the five-item scale AES shown in Table 3. In Study 3, the AES showed an acceptable level of internal consistency at both T1 ( $\alpha = .77$ ) and T2 ( $\alpha = .81$ ).

**Perceived autonomy support.** To assess students' perceptions of teacher-provided autonomy support, participants completed the six-item short version of the Learning Climate Questionnaire (LCQ; Williams & Deci, 1996). The short-version of the LCQ has been widely used in classroom-based investigations of autonomy support (Black & Deci, 2000; Jang et al., 2009), and includes the following six items: "I feel that my teacher provides me with choices and options"; "I feel understood by my teacher"; "My teacher encourages me to ask questions"; "My teacher listens to how I would like to do things"; "My teacher conveys confidence in my ability to do well in the course"; and "My teacher tries to understand how I see things before suggesting a new way to do things." The LCQ showed strong reliability across all three waves of data collection ( $\alpha$ s of .87, .88, and .92 at T1, T2, and T3).

**Data analysis.** Both agentic engagement and perceived autonomy support were assessed and entered into the analyzed model as latent variables. For agentic engagement, we used the five items from the AES as observed indicators. For perceived autonomy support, we used the six items from the LCQ as observed indicators. Hence, the data analysis involved 28 indicators for five latent variables. To prepare the hypothesized measurement and structural models for statistical testing, we first calculated multilevel analyses using hierarchical linear modeling to determine whether between-teacher differences affected students' self-reports. The

percentage of variance attributable to between-teacher differences determined from unconditional models exceeded 10% in six of the 28 measured variables with a mean intraclass correlation (across all 28 measured variables) of 5.5%. Given these between-teacher effects, we chose to use multilevel structural equation modeling with maximum-likelihood estimation in the tests of the measurement and structural models. To evaluate model fit, we again relied on the chi-square test statistic and multiple indices of fit.

## Results

The descriptive statistics for and the intercorrelations among the five latent variables included in Study 3 appear in Table 6.

**Main analyses.** In testing both the measurement and structural models, we allowed (a) the between-wave error term of each observed indicator to correlate with itself from T1 to T2, from T2 to T3, and from T1 to T3 and (b) the errors between the within-wave T2 variables to correlate in the structural model (as depicted in the curved line between T2 perceived autonomy support and T2 agentic engagement in Figure 3). The measurement model fit the data well,  $\chi^2(723) = 857.14$ ,  $p < .01$ , RMSEA (90% CI) = .059 (.052–.066), SRMR = .047, CFI = .99, NNFI = .99, and each item designed to assess its corresponding latent construct loaded as expected. The structural model testing the hypothesized model also fit the data well,  $\chi^2(725) = 863.71$ ,  $p < .01$ , RMSEA (90% CI) = .060 (.053–.067), SRMR = .049, CFI = .99, NNFI = .99. Both hypothesized paths from agentic engagement to perceived autonomy support were individually significant, as early-semester (i.e., initial) agentic engagement predicted midsemester perceived autonomy support controlling for early-semester perceived autonomy support (beta = .30,  $t = 4.15$ ,  $p < .01$ ), and early-semester changes in agentic engagement predicted late-semester changes in perceived autonomy support controlling for early and midsemester perceived autonomy support (beta = .23,  $t = 3.09$ ,  $p < .01$ ). The path diagram showing the standardized estimates for each path in the model appears in Figure 3.

**Supplemental analyses.** In follow-up analyses, we checked for three possible results. First, we tested whether the two excluded (nonhypothesized) paths from T1 perceived autonomy support to T2 agentic engagement and from T1 agentic engagement to T3 perceived autonomy support might be significant. Adding the path from T1 perceived autonomy support to T2 agentic engagement

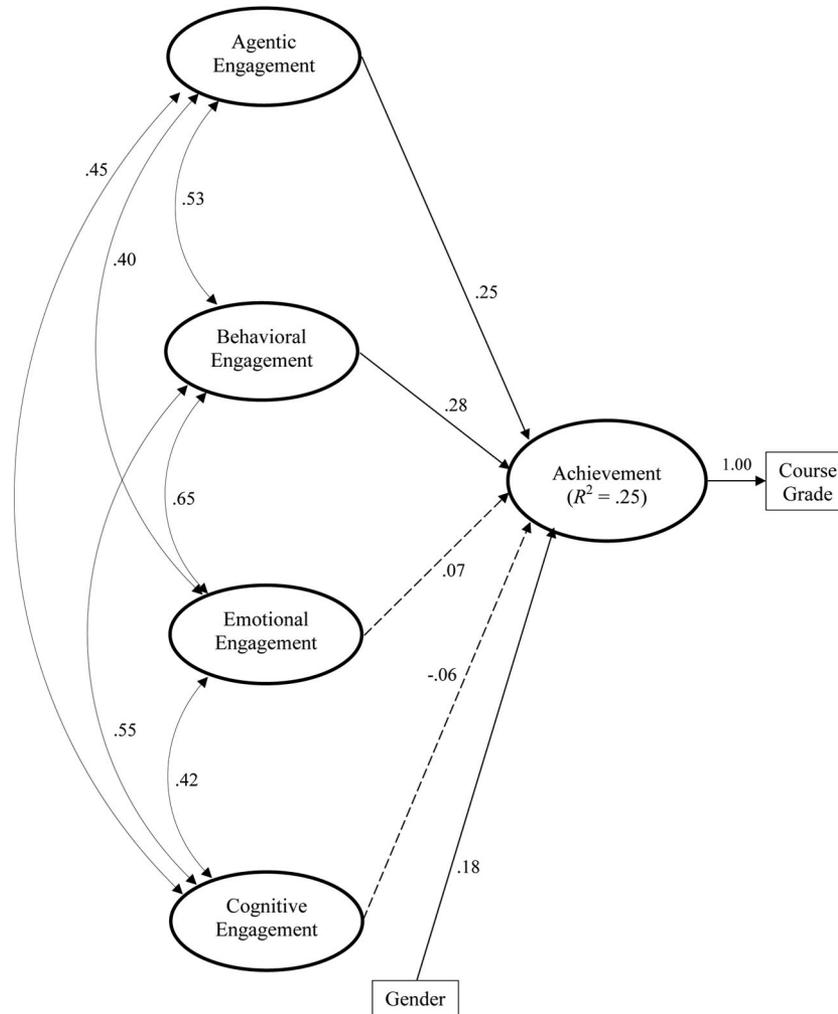


Figure 2. Standardized parameter estimates for the test of the predictive validity model, Study 2. Solid lines represent significant paths; dashed lines represent nonsignificant paths. Disturbances with gender are not shown, but they were as follows: agentic engagement,  $-.12$ ; behavioral engagement,  $-.01$ ; emotional engagement,  $.01$ ; cognitive engagement,  $-.12$ .

did not result in an improved model fit,  $\Delta\chi^2(1) = 1.78$ , *ns*, and that added path was not individually significant ( $\beta = .09$ ,  $t = 1.35$ , *ns*). The reason why we did not expect this path to be individually significant was because teacher-provided autonomy support facilitates student motivation, and it is student motivation, rather than teacher-provided autonomy support, that facilitates and explains changes in students' engagement, including students' agentic engagement (see Jang et al., 2012). Adding the direct path from T1 agentic engagement to T3 perceived autonomy support did not result in an improved model fit,  $\Delta\chi^2(1) = 1.18$ , *ns*, and that added path was not individually significant ( $\beta = -.09$ ,  $t = 1.07$ , *ns*). The reason why we did not expect this path to be individually significant was because we expected T2 agentic engagement, rather than T1 agentic engagement, to predict and explain changes in students' T3 perceived autonomy support.

Second, we used a Sobel test to evaluate if T2 agentic engagement did actually fully mediate the otherwise direct effect that T1

agentic engagement had on T3 perceived autonomy support (i.e.,  $r = .46$ ,  $p < .01$ , from Table 6). T2 agentic engagement did significantly mediate this direct effect ( $z = 2.91$ ,  $p < .01$ ). Thus, changes in agentic engagement (T2)—not initial agentic engagement (T1)—explained late-semester changes in (T3) perceived autonomy support.

Third, we tested for a possible (but not hypothesized) interaction effect between the two predictors at both T1 and T2. To do so, we created a first latent interaction variable involving the two T1 latent variables to test for their interactive relation to T2 perceived autonomy support, and we created a second latent interaction variable involving the two T2 latent variables to test for their interactive relation to T3 perceived autonomy support. To do so, we used the single product indicator approach introduced by Kenny and Judd (1984), refined by Jöreskog and Yang (1996), and validated by Li et al. (1998). This seven latent variable model (the five latent variables included in Figure 3

Table 6  
Descriptive Statistics and Intercorrelations Among the Variables in Study 3

Variable	M	SD	1	2	3	4	5
1. Agentic Engagement, T1	4.03	1.08	—	.65	.53	.48	.46
2. Agentic Engagement, T2	4.17	1.09		—	.34	.68	.59
3. Perceived Autonomy Support, T1	4.23	1.05			—	.50	.48
4. Perceived Autonomy Support, T2	4.31	1.07				—	.69
5. Perceived Autonomy Support, T3	4.40	1.16					—

Note. *N* = 302. Possible range for all variables = 1–7. T1 = Time (or Wave) 1; T2 = Time 2; T3 = Time 3. Descriptive statistics are for observed (measured) variables; intercorrelations are for latent variables. All correlations are statistically significant, *p* < .01.

plus the interaction of the two T1 exogenous variables and the interaction of the two T2 endogenous variables) did not fit the data well,  $\chi^2(832) = 2,665.54, p < .01, RMSEA(90\% CI) = .083(.077-.088), SRMR = .171, CFI = .90, NNFI = .89$ . The added paths from the T1 interaction variable to T2 perceived autonomy support was not significant (beta = .00, *t* = 0.03, *ns*), and the added path from the T2 interaction variable to T3 perceived autonomy support was not significant (beta = -0.05, *t* = 1.19, *ns*). These two nonsignificant interaction terms suggest that the effects of agentic engagement on changes in perceived autonomy support (shown in Figure 3) were robust rather than being qualified or moderated either by participants' levels of agentic engagement or by their perceptions of autonomy support.

### Discussion

The overall five-item AES again showed strong internal consistency and produced a normal distribution of scores. It also showed predictive validity in terms of explaining a student-initiated constructive change in the learning environment. Middle-school students who reported high levels of agentic engagement at the beginning of the course perceived that their teachers became significantly more autonomy-supportive toward them by midsemester, and middle-school students who reported early-semester gains in agentic engagement perceived that their teachers became significantly more autonomy-supportive toward them late in the semester. These data show that agentic engagement functioned as a student-initiated pathway to produce a more motivationally sup-

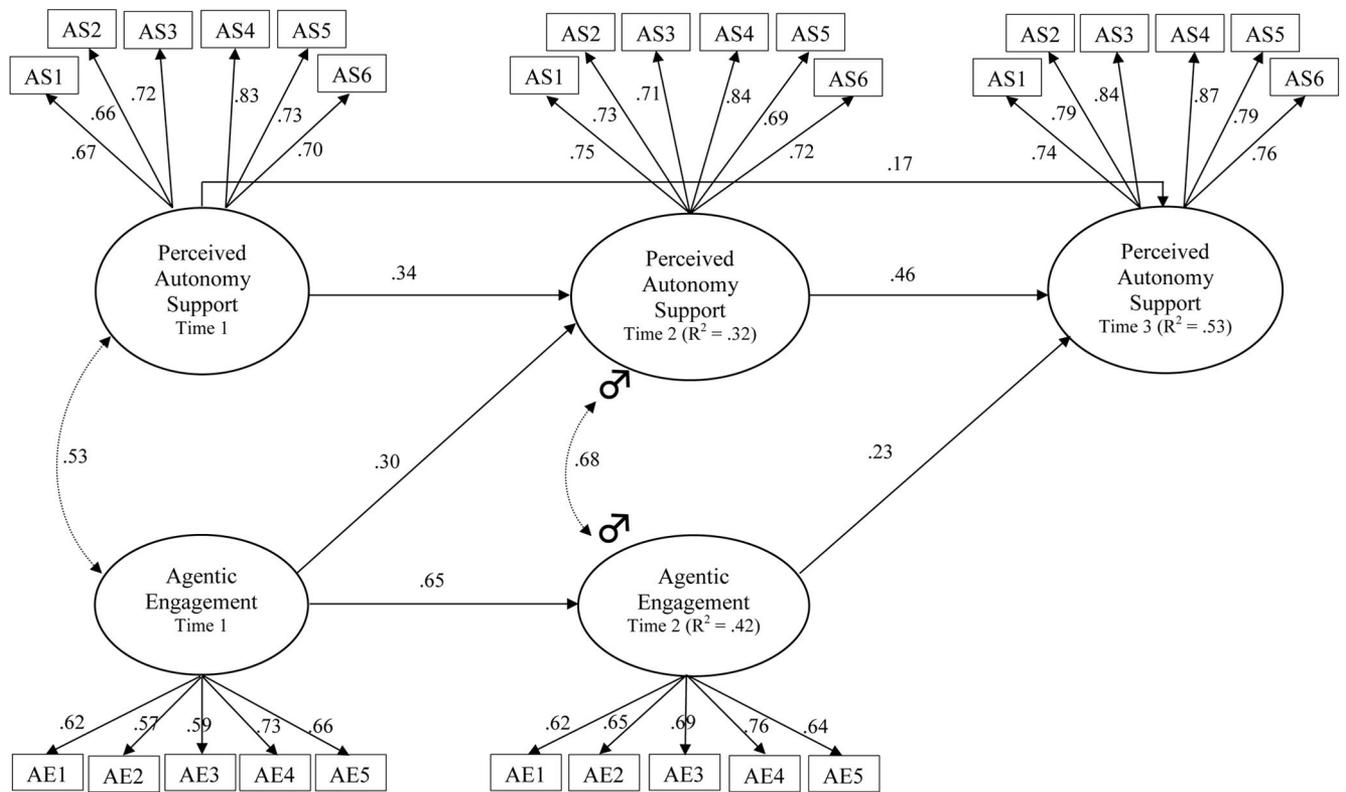


Figure 3. Standardized parameter estimates for the test of the hypothesized model, Study 3. Solid lines represent significant paths, *p* < .01. AS = autonomy support; AE = agentic engagement.

portive learning environment. What these data do not show, however, is that agentic engagement predicted unique variance in teacher-provided autonomy support, because Study 3 did not include measures of the other three aspects of engagement—a key limitation of the study that will be discussed in the general discussion section.

The longitudinal effect of students' initial agentic engagement on T2 autonomy support was large—about the same in magnitude as was the effect of T1 autonomy support on its T2 assessment (betas of .30 vs. .34). This suggests that students perceived their teachers as autonomy supportive at midsemester partly because teachers were initially autonomy supportive but also because students' own agentic engagement tended to open up teachers' motivational responsiveness. The longitudinal effect of students' T2 agentic engagement on T3 autonomy support was only half the magnitude as was the effect of T2 autonomy support on its T3 assessment (betas of .23 vs. .46). This suggests that teachers' motivating styles were more stabilized in the second half of the semester, although students' acts of agentic engagement did nevertheless exert a significant positive effect on teachers' late-semester openness and responsiveness to support students' autonomy.

One possible criticism of these findings might be that agentic engagement predicted perceived autonomy support simply because of item overlap between the two questionnaires. One item on the LCQ is, for instance, "My teacher encourages me to ask questions," while one item on the AES is, "During class, I ask questions to help me learn." It is unlikely that a methodological artifact explains the findings, however, because the findings reveal more than just a cross-sectional correlation between the two measures. The longitudinal research design showed that after controlling for this T1 correlation (i.e., after controlling for the potential methodological artifact), T1 agentic engagement predicted *changes* in perceived autonomy support, and it did so at both T2 and T3. Rather than suggesting a methodological artifact, what this longitudinal effect suggests is an emerging student-teacher synchrony as teachers became more responsive to students' initiatives (including question asking). We would add that interpersonal synchrony is a defining characteristic of most high-quality relationships (De Wolff & van IJzendoorn, 1997; Kochanska, 2002).

### General Discussion

Engagement is motivated action that functions as a student-initiated pathway to positive educational outcomes (Skinner, Kinderman, Connell, & Wellborn, 2009; Skinner, Kindermann, & Furrer, 2009). Past research had confirmed that students' behavioral, emotional, and cognitive engagements help them make academic progress, so the present study sought to extend this literature by investigating agentic engagement as a potential fourth student-initiated pathway—not only to well-established learning-related outcomes but also to the new student outcome of a more motivationally supportive learning environment.

The findings from Study 2 confirmed that acts of agentic engagement uniquely predicted course-specific achievement. This suggests that agentially engaged students are taking achievement-facilitating action during learning activities that is above and beyond their applications of effort, enthusiasm, and strategic thinking. This first benefit was depicted graphically in Figure 1 by the

horizontal "agentic engagement" directional arrow. The findings from Study 3 showed that students can, through agentic acts of engagement, further create a more motivationally supportive learning environment for themselves, at least in respect to how autonomy supportive they perceive their teachers to be. This second benefit was depicted graphically in Figure 1 by the curved "agentic engagement" directional arrow. Together, these two benefits (i.e., greater achievement, greater autonomy support) typify and effectively realize what Albert Bandura meant by his pioneering concept of agency: "To be an agent is to influence intentionally one's functioning and life circumstances" (Bandura, 2006, p. 164).

### What Is Agentic Engagement?

Because agentic engagement is proposed as a new educational construct, it is important to be clear about its conceptual nature. It is foremost a type of engagement. Like acting behaviorally, emotionally, and cognitively are pathways to positive student outcomes, acting agentially is another student-initiated pathway to positive outcomes. The five items on the AES identify explicitly what agentially engaged students are doing—namely, expressing their preferences, asking questions, and letting the teacher know what they like, need, and want. In addition to speaking up in class, agentic engagement also likely occurs more subtly, as through private conversations and e-mails, various forms of student input, and acts of cooperation, negotiation, and reciprocation that allow students and teachers to be more in synch with one another.

Agentic engagement is also a new, distinct educational construct. It is different from other aspects of engagement (as per the factor analyses in Studies 1 and 2), and it is different from classroom events such as formative assessment, clickers, constructivist learning environments, and adaptive help seeking (as discussed earlier). It is also different from more encompassing constructs, such as self-regulated learning (SRL; Zimmerman & Schunk, 2011). Self-regulation theorists view SRL "as proactive processes that students use to acquire academic skill, such as setting goals, selecting and deploying strategies, and self-monitoring one's effectiveness, rather than as a reactive event that happens to students" (Zimmerman, 2008, pp. 166–167). Those "proactive processes" include forethought (which revolves around motivation), performance (which revolves around engagement), and reflection (which revolves around the outcome). The efforts to distinguish agentic engagement from SRL and to situate this new educational construct within the SRL framework raise two key questions: (a) Can agentic engagement be explained within the SRL framework to the point that this new concept is not needed—because it already exist by another name? and (b) Where would agentic engagement fit if it were to be integrated within the SRL framework?

The answer to the first question is that agentic engagement cannot be subsumed within the SRL framework, at least not within the framework's current conceptualization (Zimmerman & Schunk, 2011). The key difference between the two approaches is the role and function of the teacher in supporting the learner's motivation and academic progress. Agentially engaged students work transactionally with the teacher to create learning conditions that can vitalize their otherwise latent inner motivational resources (e.g., autonomy-supportive teaching; Ryan & Deci, 2000). That is, agentially engaged students solicit and rely on their teachers'

professional insight, teaching skill, and classroom experience to create motivationally enriching classroom conditions for them, such as by providing choices to vitalize their otherwise latent autonomy, optimal challenges to vitalize their competence, and social interaction opportunities to vitalize their relatedness. In SRL theory, social agents are also very important, but their role is to shift a student's learning from initially social to eventually self sources of regulation (Schunk & Zimmerman, 1997). That is, through initial modeling and social guidance to later social emulation and corrective feedback, students gradually acquire a greater capacity to regulate their own learning in the *absence* of social supports (e.g., during homework; Stoeger & Ziegler, 2011). That is, the goal of SRL is to develop independent learners who can monitor and regulate their thinking, wanting, and acting, while the goal of agentic engagement is to recruit the interpersonal support necessary to create a motivationally supportive learning environment.

The answer to the second question is that agentic engagement would fit within SRL's "Performance" phase. The Performance phase includes behavioral (i.e., attention focusing, effort) and cognitive (i.e., self-instruction, task strategies, metacognitive monitoring) engagement, but it includes only the suggestive hint of agentic engagement (i.e., environmental restructuring, help seeking). What the new concept of agentic engagement can do for the SRL framework is what it can do for all educational models of students' motivation and engagement—namely, expand what it means for a motivated learner to be actively involved during a learning activity.

The two failed candidate AES items from Study 1 to represent students' personal contribution to their own learning (Items 8 and 9 in Table 1) help distinguish SRL and what self-regulated learners do from agentic engagement and what agentially engaged students do. These two items were "I try to make whatever we are learning as interesting as possible" and "I adjust whatever we are learning so I can learn as much as possible." Both items loaded with the cluster of cognitive engagement items rather than with the cluster of agentic engagement items. In doing so, they better captured what cognitively engaged SRLs do—try to gain control over their own learning. To help student gain better self-control over their own learning, teachers tutor, coach, mentor, and scaffold students' forethought, performance, and reflection. In doing so, they help students acquire and then refine ever-more sophisticated self-regulatory capacities. This is, however, fundamentally different from the instructional effort to vitalize students' inherent—although sometimes latent—inner motivational resources (Reeve, Ryan, Deci, & Jang, 2008).<sup>4</sup> Behaviorally engaged and cognitively engaged student may attend to, emulate, and internalize their teachers' tutoring, coaching, mentoring, and scaffolding, but agentially engaged students uniquely try to work collaboratively with their teachers to create a personally more motivationally supportive learning environment. Appreciating what these agentially engaged students are doing seems like a profitable future area of research (and practice) for SRL theorists.

### Agentic Engagement as an Antecedent of Autonomy Support

A teacher's autonomy support benefits students in a multitude of ways, including enhancing their motivation, learning, and well-

being (Assor, Kaplan, & Roth, 2002; Cheon, Reeve, & Moon, 2012; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). Because of these benefits, it becomes important to understand why teachers are (and are not) autonomy supportive and also how they might learn to become more autonomy supportive toward students. Intervention-based research shows that teachers can learn how to become more autonomy supportive, but this same research also shows that teachers need considerable help and expert guidance to learn how to do so (Su & Reeve, 2011).

It strikes us as entirely possible that highly agentially engaged students can provide teachers with in-class opportunities to self-learn how to become more autonomy supportive. The defining characteristics of autonomy support include taking the students' perspective, welcoming their thoughts, feelings, and behaviors into the delivery of instruction, and providing learning activities in ways that vitalize (rather than neglect or frustrate) students' inner motivational resources (Reeve, 2009). Agentially engaged students therefore provide teachers with opportunities to learn how to be more autonomy supportive when they communicate their perspective, add their thoughts, feelings, and behaviors into the flow of instruction, and let teachers know what they like, need, and want. To the extent that this is true—and the findings reported in Study 3 did provide rather compelling evidence that students' agentic engagement contributes to constructive changes in teachers' motivating styles—then it changes the notion of a teacher's classroom motivating style away from something that resides within the teacher and toward something that, at least in part, unfolds during interaction with students (Sameroff, 2009; Sameroff & Fiese, 2000).

### Limitations and Future Research

Study 3 showed that agentic engagement predicted longitudinal changes in perceived autonomy support. This conclusion is limited, however, because the only aspect of engagement included in the study was agentic engagement. Failing to include measures of behavioral, emotional, and cognitive engagement leaves open the question of whether any of these other aspects of engagement might also individually predict unique variance in perceived autonomy support. Thus, while the findings in Study 3 supported the conclusion that student-initiated acts of agentic engagement help transform teachers' motivating styles, they did not establish agentic engagement as the *unique* engagement-based predictor of these changes. It may be, but its unique status has not yet been tested. Our expectation is that agentic engagement would be the only T1 engagement predictor of these changes in the learning environment, because it is uniquely proactive, intentional, and collaborative in ways that the other three aspects are not. However, changes in behavioral engagement might also uniquely predict changes in perceived autonomy support. Even if they did, however, these effects would likely be only indirect or inadvertent (as explained in the Introduction).

<sup>4</sup> In self-determination theory, what teachers do to cultivate students' self-regulatory capacities is referred to as teacher-provided *structure*, while what teachers do in response to students' acts of agentic engagement is referred to as teacher-provided *autonomy support* (Jang, Reeve, & Deci, 2010).

One limitation that extended across all three studies was inconsistent sampling. Study 1 used only a convenience sample of engineering studies, Studies 1 and 2 used college students, while Study 3 used middle-school students. These samples differed in terms of their ages, subject matters, and classroom dynamics, so it was reassuring to see that the distribution of AES scores produced by these varying samples were fairly similar (see Table 3). Another sampling concern was gender, and it is not yet clear if agentic engagement is different between males and females. All three studies tested for gender differences, and none found significant differences, although there was a trend in Studies 1 and 2 for males to report higher levels than females. One characteristic that did not vary from study to study was that all three studies sampled only Korean students. Students may experience and express their classroom engagement differently from one culture to the next, and these different ways of trying to make academic progress may possess different predictive utility from one culture to the next. Hence, the hypotheses tested in the present study need to be evaluated in non-Korean classroom contexts as well (especially in Western classroom contexts).

Study 3 was limited in that it included only self-report data. An objective measure of teachers' autonomy-supportive motivating style (e.g., scores from trained raters) would be a welcomed addition to this methodology (as per Cheon et al., 2012; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Tessier, Sarrazin, & Ntoumanis, 2008).

Adding agentic engagement as a fourth aspect of engagement introduces new research opportunities. Here, we identify four. First, the present study identified greater achievement and greater motivational support as two student outcomes associated with agentic engagement. Additional outcomes might also be possible. For instance, agentially engaged students likely spend more classroom time involved with personally interesting, valued, and goal-relevant learning activities. Second, because agentially engaged students create both greater achievement and greater motivational support, these gains should accumulate into an impressive developmental trajectory. It would be informative to track these benefits longitudinally—not just over the course of a semester (as in Study 3) but over the course of schooling (e.g., from enrollment to graduation). The prediction would be that agentially engaged students, compared to their non-agentially engaged counterparts, would be able to create motivationally supportive classroom conditions that set the developmental stage for an ever-increasing growth trajectory of positive outcomes. Third, the present study limited its focus to the teacher-student interaction. But learning environments are also offered by parents, coaches, and tutors. Highly agentially engaged students may attempt to contribute to these learning environments in the same way that they attempt to contribute to teacher-provided learning environments. Fourth, future research will likely find Figure 1 to be an oversimplified depiction of how students benefit from their classroom engagement. For instance, engagement likely contributes positively to constructive changes in students' motivation (Reeve & Lee, 2013). So, instead of providing a comprehensive model of the interrelations among classroom conditions, motivation, engagement, and outcomes, the figure more modestly communicates the dual benefits of students' agentic engagement (greater learning, greater motivational support).

## Conclusion

Across three studies, agentic engagement was associated positively with agentic-rich motivation and negatively with agentic-impoverished motivation, contributed uniquely to course-specific achievement and predicted longitudinal changes in teachers' classroom motivating style. The general conclusion is that agentic engagement is a new and constructive aspect of student engagement that allows educators to more fully appreciate how students actually engage themselves in learning activities, as they not only try to learn and develop skill, but they also try to create a more motivationally supportive learning environment for themselves.

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