

Engagement versus Motivation:
A Confirmatory Factor Analysis of the Motivation and Engagement Wheel

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Abstract

Both engagement and motivation have been identified as constructs that are critical to student success and are linked with later academic achievement. However, the multitude of conceptualizations around these constructs and how they relate to one another has become a point of contention within the field. The primary aim of the current study is to examine a model of academic engagement and motivation, the motivation and engagement wheel (MEW), using the Motivation and Engagement Scale (MES; Martin, 2009; Martin, Ginns, & Papworth, 2017) and replicating the model structure with a more diverse, elementary-aged American population. Secondly, the current study aimed to expand the MEW by examining an adapted model structure that included alternate components of motivation and engagement as measured by the Engagement Versus Disaffection with Learning-teacher and student reports and Patterns of Adaptive Learning Scale. Participants included 270 students in 3rd - 6th grade (predominately African American, 67.4%), from an urban area in the Midwestern United States. Confirmatory factor analysis (CFA) techniques were used to compare the higher order structure across models. As hypothesized, the four-factor higher order models, comprised of adaptive engagement, adaptive motivation, maladaptive engagement, and maladaptive motivation, which best align with the MEW, demonstrated best fit across both the replication and adaptability models. Thus, this study provided additional support for the structure of the MEW, and preliminary evidence for its adaptability as a theoretical model.

Keywords: adaptive engagement, adaptive motivation, maladaptive engagement, maladaptive motivation

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CHAPTER 1

Introduction

Engagement and motivation in school make it possible for students to learn in the classroom, and therefore are foundational to academic success (e.g., Greenwood, Terry, Marquis, & Walker, 1994). To this end, both motivation and engagement have been identified as academic enablers (DiPerna & Elliott, 2002). While variation exists in how these constructs are defined, generally motivation is conceptualized as an internal drive or desire to make an attempt or complete a task or behavior, while engagement is conceptualized as attention and actions aligned to expected behaviors. More specifically, engagement aligns more to actions while motivation aligns more to thoughts. Throughout educational literature both constructs have been identified as critical components of academic achievement (e.g., Finn & Rock, 1997). Academic engagement is positively correlated with standardized test scores and grades (e.g., Marks, 2000; Singh, Granville, & Dika, 2002), and has been established as a protective factor against school risk factors (Finn & Rock, 1997). Alternatively, a lack of engagement has been associated with school dropout (Archambault, Janosz, Morizot, & Pagani, 2009). This is true for students with and without exceptionality; if engagement is low, students are less likely to complete high school (Reschly & Christenson, 2006). Additionally, early difficulties with academic engagement have been linked to a long-term negative impact on grades and test scores (Alexander, Entwisle, & Horsey, 1997).

From teachers' perspectives, motivating students has long been perceived as a major problem across all grade levels, regardless of experience levels of the teachers (Veenman, 1984). In other words, a lack of motivation is a pervasive academic concern.

Students' engagement is also a concern for teachers; when a child is not academically engaged it not only contributes to their own lack of learning, but also has the potential to negatively impact the teacher and other students in the classroom. According to one survey, 36% of teachers reported losing more than two hours of instruction time per week due to behavioral concerns (Walker, Ramsey, & Gresham, 2003). Findings were even more drastic for teachers in urban areas—Walker and colleagues reported 21% of teachers in urban settings lost more than four hours per week because of behavioral redirection. According to Archambault et al. (2009), children who present low engagement by middle school should be considered a high-priority for targeted intervention. Consequently, preventative interventions that focus on increasing motivation and engagement could begin as early as elementary school.

Over the past several decades, the impact engagement and motivation have on academic success has become well-established in the research literature, with the benefits universally recognized across varied theoretical perspectives (e.g., Christenson, Reschly, & Wylie, 2012; DiPerna & Elliott, 2002; Finn & Rock, 1997). Indeed, to date over eight theories have been developed to help explain the phenomena of motivation and engagement. While diverse perspectives do exist, a primary theme throughout each theory is that engagement and motivation are generally considered to be closely related constructs with a spectrum of inhibitors and facilitators. However, close examination of this body of research also reveals inconsistencies with how motivation and engagement are conceptualized, measured, and defined. Thus, while there is agreement on the concept of motivation and engagement broadly and their academic benefits, there is still disagreement in the field regarding operationalization of these constructs and how they

relate to one another. From some theoretical perspectives, engagement and motivation have been conceptualized as interchangeable and measured as a single construct rather than two separate factors. This was the case for the original motivation and engagement wheel, a model of engagement and motivation established by Martin (2007), which has since been revised. However, many researchers posit engagement and motivation are closely related, but separate constructs—a more prominent and current perspective in the field (e.g., DiPerna, Volpe, & Elliott, 2002; Martin, Ginns, & Papworth, 2017; Reschly & Christenson, 2012). Given these differing perspectives, the conceptual and theoretical relationship between engagement and motivation has become a point of contention in the field (Reschly & Christenson, 2012). Consequently, the current state of the science lacks coherence and consensus. The primary aim of this research study was to add clarity to conceptualization of adaptive and maladaptive engagement and motivation, and better understand the relationship between these broad constructs. These perspectives were examined in the current study through comparing model fit for models that represent a single combined engagement and motivation latent construct and other models that separated engagement and motivation into multiple latent constructs, replicating models associated with the updated version of the motivation engagement wheel (MEW; Martin et al., 2017).

Recently, Martin and colleagues (2017) proposed an updated model for the MEW in which motivation and engagement are conceptualized as distinct constructs that interact in a cyclical fashion. From their perspective, motivation is defined as “the inclination, energy, emotion, and drive relevant to learning, working effectively, and achieving,” while engagement is defined as “the behaviors that reflect this inclination,

energy, emotion, and drive” (Martin et al., 2017, p. 150). In this most recent study, Martin and colleagues (2017) used confirmatory factor analysis to compare four higher-order models of engagement and motivation: a single-factor higher-order factor in which engagement and motivation were a single construct, a two-factor higher-order model that separated engagement and motivation, a two-factor higher-order model that separated adaptive and maladaptive components, and a four-factor higher-order model made up of adaptive engagement, adaptive motivation, maladaptive engagement, and maladaptive motivation. Fit indices indicated that the four-factor model had the best fit. Thus, within this updated model, engagement is broken into adaptive and maladaptive behaviors, and motivation is also separated into adaptive and maladaptive cognitions (see Figure 1). While this model holds promise, several gaps and limitations exist that require further study.

Rationale

The MEW model was chosen for replication over other models of engagement and motivation for a variety of reasons. First, the MEW holds promise because it posits a bi-directional relationship between engagement and motivation, accepting different aspects from a variety of conceptualizations. While some models propose that motivation drives engagement (i.e., DiPerna & Elliott, 2002) and others suggest that engagement influences motivation (i.e., Reeve & Lee, 2014), the MEW posits a cyclical relationship demonstrating a broader conceptualization of engagement and motivation that encompasses multiple theoretical perspectives (a more detailed review of different theoretical perspectives and models of engagement and motivation can be found in Chapter 2). Another reason the MEW was chosen in the current study is the explicit

inclusion of both positive and negative components of engagement and motivation within the model. While inhibitors and facilitators of these constructs are universally accepted and measured, the MEW provides a parsimonious conceptualization and is the only model that parses apart adaptive and maladaptive factors into their own constructs. In other words, most models will measure both positive and negative components on the same scale, but Martin's model provides additional information by separating adaptive and maladaptive components into different constructs. For instance, measuring maladaptive components of engagement (e.g., self-handicapping) does not necessarily provide information about adaptive engagement (e.g., task management). Thus, more information is gained in separating into constructs. This conceptualization also holds particular promise for intervention; by differentiating between adaptive and maladaptive cognitions and behaviors, interventions could be better targeted to address the underlying problem. For example, maladaptive cognitions could be targeted through cognitive behavioral therapy, while maladaptive behaviors may be better served through a self-monitoring intervention. Therefore, the current study aimed to replicate Martin and colleagues' (2017) MEW model and assess the adaptability of their model using additional measures of engagement and motivation.

While Martin and colleagues' (2017) MEW is a well-known model of academic engagement and motivation, there are number of limitations associated with their research. First, neither the original nor the updated model has been replicated outside of the original research group despite being widely accepted and used over the past 10 years. Replication is particularly essential with confirmatory factor analysis (CFA) due to the influence of sample on factor analytic techniques (Tabachnick & Fidell, 2013).

Additionally, the model relies solely on the Motivation and Engagement Scale (MES) measure, which is potentially problematic because MES was developed by Martin's research team. Models can be strengthened by utilizing multiple measures to represent latent variables. Maruyama (1998) suggested using multiple measures for each construct is the only defensible way in which to create viable models. Additionally, utilizing measures that are not directly derived from the MEW will permit further validation of the model, allowing for the possibility to better understand how the MEW bridges multiple conceptualizations of engagement and motivation. Lastly, Martin and colleagues' (2017) study was conducted with a relatively homogenous Australian population, within a secondary educational setting, which impacts the generalizability of their findings to students in the United States. In addition, although the MES was developed and has been validated for students nine years of age and older, the higher order structure of the MEW has only been tested with a secondary sample. Thus, there is a need to further examine this relationship between engagement and motivation utilizing a more diverse, elementary aged population.

Purpose. The primary purpose of this study was to examine the relationship between adaptive and maladaptive engagement and motivation by replicating the models presented by Martin et al. (2017) with a more diverse, and elementary aged American sample to confirm their four-factor higher-order model. Secondly, this study aimed to capture additional components that make up these constructs beyond those included in the MES. More specifically, by including additional measures of motivation and engagement that include components of these constructs beyond those currently assessed in the MEW, it may strengthen our conceptualization of positive and negative

engagement and motivation beyond what is captured by the measure created by Martin and colleagues.

Research questions. Based on prior research and theory and using the MEW as the conceptual base and the MES, Engagement Versus Disaffection with Learning-teacher and student reports (EvsD), and Patterns of Adaptive Learning Scale (PALS) as the measurement base, this study aimed to answer the following research questions:

1. Which higher-order structure, as replicated from models proposed by Martin and colleagues (2017), best fits an American, elementary aged population as compared to findings of a four-factor structure for the MEW from an Australian high school population (Martin et al., 2017) as assessed through CFA of students' MES scores?
2. Do alternate measures of adaptive and maladaptive motivation and engagement uphold the higher-order four-factor structure of the MEW (e.g., the adaptive and maladaptive engagement and motivation quadrants) as determined by CFA?

Based on findings from Martin and colleagues, it was expected that the four-factor structure of the MEW would also fit a more diverse, American, elementary aged population. Additionally, we anticipated that alternative measures of engagement and motivation, that capture additional components of these constructs (e.g., interest and on-task behavior; see Appendix A), would fit within the adaptive motivation, adaptive engagement, maladaptive engagement, and maladaptive motivation quadrants represented in Martin's (2017) updated MEW, thus upholding the four-factor higher order structure of the model.

CHAPTER 2

Literature Review

Central to understanding the research literature on engagement and motivation involves understanding the theoretical perspectives and definitions underlying these constructs. Prior to reviewing these prominent theories and corresponding definitions, it is important to first contextualize the intricacy and complexity of doing so. For example, engagement can be conceptualized as unidimensional (e.g., on-task behaviors; Fisher & Berliner, 1985) or, more commonly, multidimensional (e.g., including internal and external components of engagement; Appleton, Christenson, Kim, & Reschly, 2006; Fredricks, Blumenfeld, & Paris, 2004). Within this multidimensional conceptualization of engagement, differences even exist with regard to the number and nature of proposed components. While the majority of engagement scholars align with a three-part conceptualization (i.e., behavioral, cognitive, and emotional engagement; Christenson et al., 2012; Fredricks et al., 2004), the operationalization of the individual subtypes of engagement varies across researchers.

To further complicate matters, the term motivation is often not defined (e.g., Christenson & Anderson, 2002) or defined subjectively (e.g., “*to be moved to do something*,” Ryan & Deci, 2000, p.54). It is generally agreed amongst researchers that motivation is an internal or private construct (Reeve, 2012). However, different theoretical orientations are associated with distinct conceptualizations surrounding the underlying components of motivation (e.g., self-efficacy, goal setting, mastery orientation). To add to the confusion, similar terms are used to describe vastly different concepts and vastly different terms are used to describe similar concepts for both

engagement and motivation. For instance, both affective engagement and emotional engagement are used interchangeably throughout the literature. Conversely, behavioral engagement is often defined in terms of on-task behaviors, but also used to describe attendance, suspensions, and being on time depending on the researcher (e.g., Christenson et al., 2012).

While engagement and motivation are conceptualized in uni- and multi-dimensional formats across educational literature (Reschly & Christenson, 2012), assumptions regarding the existence of a relationship between these constructs remains consistent. However, the conceptualization of this relationship differs across theoretical perspectives and how engagement and motivation are defined. Depending on the theoretical perspective, engagement and motivation have been conceptualized as an interchangeable single construct (e.g., Martin, 2007; Skinner & Belmont, 1993) or closely related, but separate constructs (e.g., DiPerna et al., 2002; Martin et al., 2017; Reschly & Christenson, 2012). Given the influence engagement and motivation have on academic achievement, it is of particular interest to better understand these constructs and how they relate to one another from both theoretical and applied perspectives. This chapter outlines prominent theories of engagement and motivation, discusses the impact these theories have on the conceptualization of engagement and motivation, and describes how they relate to one another in order to synthesize findings from theoretical literature and increase conceptual clarity of these constructs to better inform research and practice. For the purpose of the current study, theories were operationalized as underlying ideas used to explain a phenomenon. Models, on the other hand, were conceptualized as mathematical representations based on theory (Grüne-Yanoff, 2013). There are a number

of key differences between theories and models: a) theory is a generalized explanation, while models are specific to populations and measures utilized; b) theories are abstract conceptualizations, while models are statistically driven; and c) theories are based on observed phenomena, while models are based on experimentation and mathematical manipulation.

Prominent Theories of Engagement and Motivation

Achievement Goal Theory

According to achievement goal theory (AGT) there are multiple contrasting motivational processes, which underlie behaviors in achievement-type activities. Thus, the basis of AGT focuses mainly on the construct of motivation without explicitly defining engagement. Specifically, one's approach and engagement in an achievement activity, concept of self, and the task outcome determine if success is of intrinsic or extrinsic value (Ames, 1992). Across researchers, the name for the opposing processes differ; however, the theory remains aligned to orienting towards internal gains, such as acquiring knowledge, versus orienting towards external gains, such as grades or money. Maehr and Nicholls (1980) refer to these processes as task-involvement versus ego-involvement goals, while Ames and Archer (1988) utilized the terminology of mastery versus performance goals. Similarly, Elliott and Dweck (1988) preferred the terms learning versus performance goals. In other words, task-involvement, learning, and mastery goals all refer to success as determined by internal gains. Ego-involved and performance goals, on the other hand, refer to success as determined through external markers.

While AGT does not explicitly discuss engagement, there is a focus on motivation in which “active engagement” is an essential component. Within this theory, active engagement refers to the application of learning and problem-solving strategies, with an underlying belief that hard work leads to success, and failure can be remedied by effort (Ames, 1992). Motivation is not overtly defined within this theory. Instead, AGT provides the framework that informs motivational patterns (Ames, 1992). Specifically, mastery goals are aligned to a motivation to learn, which is associated with a higher quality of participation that will likely sustain across settings (Ames, 1992; Brophy, 1983). Consequently, mastery orientation is linked with risk-taking behaviors and persistence throughout achievement activities (Elliott & Dweck, 1988; Meece, Blumenfeld, & Hoyle, 1988). Conversely, performance orientation is associated with ability as determined through surpassing peers or norm-based standards. Through a performance goal lens, achievement with little effort is perceived as a greater success than achievement through hard work (Ames, 1992). Additionally, performance orientation leads to a motivational pattern that is associated with avoiding failure. Thus, performance oriented individuals are more likely to take on less challenging tasks in order to maintain success through preventing failure (Ames, 1992).

While sometimes categorized as its own theory (e.g., Martin et al., 2017), subsequent researchers have expanded on AGT’s perspective of goal orientation to include perceptions of success and failure within mastery and performance goal orientations. More specifically, goal orientations can be categorized as success-oriented compared to failure-avoidant (Martin & Marsh, 2003). Success-oriented students are often characterized as proactively oriented towards their studies. Failure-avoidant

orientation, on the other hand, is associated with self-handicapping or procrastination in case of poor performance. It is important to note that neither success-oriented nor failure-avoidant orientations is associated with a specific goal-type, but rather both mastery and performance goals can be split into success- or failure avoidant-orientations.

When AGT was originally conceptualized, goal orientations were often thought of as more stable traits rather than a changeable perspective within an individual. However, as the theory developed, researchers began proposing the malleability of these orientations. According to Dweck (2007), some individuals view intelligence as fixed while others perceive it to be malleable (i.e., fixed- versus growth-mindset). Similar to performance goal orientations, individuals with fixed mindsets believe that, if you have the ability, then effort is unnecessary. In contrast, individuals with growth mindset value effort and are more likely to take risks in achievement activities; thus, growth mindset parallels mastery goal orientation. Dweck also emphasized that fixed versus growth mindsets are not traits, but perspectives that can be taught. In other words, according to the growth mindset perspective, educators could help facilitate learners' understanding that goals can be achieved through effort and persistence through challenges.

To summarize, AGT is a theory that focuses on the impact an individual's goal orientation has on motivational patterns. Students who are more aligned to the performance orientation care less about the process of gaining knowledge, but are motivated by norm-based standards. Mastery orientation, on the other hand, is associated with a motivation to learn. Thus mastery orientated individuals believe effort and success are linked, and are therefore more likely to persist through challenges. AGT has been expanded throughout educational literature to include the impact of failure-avoidant

versus success oriented perspectives, and has even driven much of the research on growth mindset, which is currently receiving a lot of attention in schools. Thus, AGT is a primary theory of motivation within the field.

Social Cognitive Theory

Social cognitive theory (SCT) is another prominent theory of motivation and engagement. It posits human behavior as a function of the interaction between personal dynamics (e.g., concepts of self), actions, and environmental factors (Bandura, 1986). Based in this theory, goal setting, causal attributions, self-regulation, and self-efficacy are considered key constructs that underlie both engagement and motivation (Eccles & Wigfield, 2002; Schunk & Mullen, 2012). Similar to AGT, neither motivation nor engagement are explicitly defined within this theory. Instead, it is the reciprocal relationship between the personal factors, actions, and environment that influence both engagement and motivation.

According to Schunk and Mullen (2012), self-efficacy—an individual's perceived ability to learn or complete tasks at different levels of difficulty—can be used to demonstrate a cyclical relationship. For instance, self-efficacy has been shown to influence task choice, effort, persistence, and use of learning strategies (i.e., behaviors; Schunk & Mullen, 2012). Conversely, these actions lead to increased learning, which affects self-efficacy and an individual's motivation to continue engaging in behaviors. This process is often discussed using the term self-regulation within engagement and motivation literature (Eccles & Wigfield, 2002). Self-regulated students are viewed as motivationally and behaviorally active in their own learning process and in achieving their personal goals. Thus, goal setting also plays an important role within the SCT

perspective of engagement and motivation. In a study conducted by Bandura and Schunk (1981), the intervening process of goal setting and self-evaluation affects self-motivation, with self-efficacy being associated with greater achievement gains. Thus, unlike AGT which traditionally views underlying constructs of motivational patterns as traits (e.g., mastery or performance oriented), SCT views motivational patterns and engagement as continuously changing through a reciprocal relationship between concept of self, environmental factors, and actions.

Self-Determination Theory

Self-determination theory (SDT) also conceptualizes motivation and engagement in cyclical pattern. SDT is a theory of human motivation, which is defined as being “energized or activated towards” a task (Ryan & Deci, 2000, p. 54). Thus the primary focus of SDT is motivation, with an underlying focus on engagement. According to SDT, humans are driven to maintain an optimal level of stimulation while balancing a need for competence (Eccles & Wigfield, 2002). In other words, individuals seek tasks that they are successful in completing, but are not overly simplistic. According to Deci and Ryan (1985), the developers of SDT, motivation is expressed through different causal orientations of intrinsic, and extrinsic motivation. Intrinsic motivation refers to doing something because it is interesting or enjoyable, while extrinsic motivation leads to a separate outcome (e.g., getting a good grade; Ryan & Deci, 2000). Intrinsic and extrinsic motivation are maintained when individuals feel both competent and self-determined (Eccles & Wigfield, 2002).

However, within this theory, motivation is not dichotomously intrinsic or extrinsic (Ryan & Deci, 2000). Instead, individuals who are truly self-determined transfer external

regulation inside through a process called internalization. The progression of internalization can be explained through four different levels: external, introjected (internal based on a feeling of requirement), identified (internal based on the usability of the behavior), and integrated regulation (internal based on one's own values; Ryan & Deci, 2000). For example, consider the possible progression of a student in school – initially a student may complete homework for an extrinsic reason (e.g., a grade), but later may recognize that good grades are expected from his or her parents (introjected regulation). Later that student may realize that good grades will lead to a better college (identified regulation), and eventually the student may begin to value the act of learning (integrated regulation). Thus, increased internalization is associated with greater persistence, a more positive sense of self, and higher quality engagement in achievement activities (Ryan & Deci, 2000).

Additional Theories

Attribution theory. Attribution theory posits that an individual's causal attributions (i.e., explanation) for achievement outcomes determine future achievement efforts (Weiner, 1985). In other words, their explanation for success or failure will not only drive their engagement in an activity, but also their future motivation for achievement. Ability, effort, task difficulty, and luck are some examples of achievement attributions, which can be categorized under locus of control, stability, and controllability (Eccles & Wigfield, 2002). Locus of control is represented by internal versus external believed causality. Stability refers to whether causes can change with time (e.g., effort can change over time). Lastly, the controllability dimension refers to causes that can and cannot be controlled (e.g., skill versus luck; Weiner, 1985). Similar to SCT and AGT,

attribution theory also suggests goal setting as an essential, but not the solitary component of motivation. According to the attribution theory, goal setting and expectancy to attain that goal are central to motivational beliefs (Eccles & Wigfield, 2002).

Flow theory. Another theory that emphasizes intrinsically motivated behavior is Csikszentmihalyi's flow theory (Csikszentmihalyi, 1997). Flow theory defines intrinsic motivation as the immediate subjective experience that occurs when people are engaged in an activity. While SDT interprets intrinsic motivation in terms of ultimate as opposed to immediate reason for behavior, Eccles and Wigfield (2002) suggest that these theories reflect a different perspective of the same point. Flow theory is also closely aligned to engagement in that "flow"—a holistic feeling of being immersed in an activity, a merging of action and awareness, lack of self-consciousness, and a feeling of control over both actions and the environment—is experienced only when an individual is fully engaged emotionally (Nakamura & Csikszentmihalyi, 2009). Also, flow can only be achieved when skill and challenge level are matched, which aligns with SDT's optimal performance perspective.

One limitation of flow theory is the fact that it primarily describes optimal levels of engagement and intrinsic motivation; there is little to no discussion surrounding any type of engagement or motivation outside of flow. This is quite limiting as flow is typically experienced by experts (Eccles & Wigfield, 2002). Nakamura and Csikszentmihalyi (2009) discussed different behaviors in terms of intrinsically rewarding and aversive situations; relaxation and flow are both intrinsically rewarding, while overwhelming demands and apathy are aversive situations. Thus, flow theory describes

optimal functioning through complete emotional engagement through intrinsic motivation and a complete lack of engagement and motivation, but nothing in between.

Interest theories. While there is not a single theory for interests' role in motivation and engagement, there was an upsurge in this theoretical framework during the 1990's (Eccles & Wigfield, 2002). Across these theories, individual versus situational interests are differentiated; individual interests refer to stable orientations toward domains while situational interest is described more as an emotional state associated with an activity. Individual interests can be broken down even further into feeling- (feelings associated with a task) and value-related (personal significance) valences (Eccles & Wigfield, 2002). Specific to learning, both individual and situational interest are associated with deeper levels of learning (Schiefele, 1991). Thus, interest, which is merely implied from other theoretical perspectives, may be an important factor missing from prominent theories previously discussed.

Self-system theory. The self-system theory of motivational development suggests that autonomy, competence, and relatedness are fundamental motivational needs that lead to engagement (Fredricks & McColskey, 2012). This model is closely aligned to an expansion of SDT, but also incorporates some components of interest theories. SDT was developed beyond intrinsic and extrinsic motivation to include additional causal orientations: autonomy orientation (decisions based on own choice), control orientation (decisions based on expectations or environment), and interpersonal orientation (decisions are beyond own control; Deci & Ryan, 1985), which parallel those represented in the self-system model of motivation. Regarding the relationship between engagement and motivation, self-system model assumes motivation is a necessary, but not sufficient,

precursor to engagement. Specific to school settings, Fredricks and McColskey (2012) suggest that students who have opportunities aligned with these motivational factors (e.g., task choice, scaffolded learning opportunities) will be more engaged in the classroom.

Expectancy X value theory. According to the expectancy X value theory, the amount of effort an individual puts forth to reach a goal is a function of their expectancy to reach the goal with effort and the value they place on reaching said goal (Brophy, 1983). Brophy argued that motivation to learn must not be maximized, but rather optimized. The relationship between motivation and performance can be described as an inverted U, in that an individual reaches their peak performance when motivation is at an optimal level. Despite attribution theory being founded from expectancy X Value theory, it also closely aligns to SDT's perspective that humans are motivated to maintain an optimal level of stimulation and competence. Additionally, flow theory also emphasizes the concept of optimizing intrinsic motivation to gain complete engagement.

Models and Measurement

Through previously discussed theories that focus on the constructs of engagement and motivation it is clear that the relationship between these constructs can be described in a number of ways. While some (e.g., SCT & SDT) view engagement and motivation as mutually reinforcing of one another, others (e.g., AGT) view motivation as an underlying contributor to engagement. Additionally, despite the abundance of theories underlying engagement and motivation, theories are more general conceptualizations of phenomena. Models, on the other hand, are statistical representations based on theory. Therefore, a limited number of models that describe how these constructs relate to one another, using specific measures and mathematical representations, are included below.

Model of academic enablers. DiPerna and Elliott (2002) define academic enablers as a set of attitudes and behaviors that allow students to benefit from school. Within their model, engagement and motivation, along with study and interpersonal skills, were identified as the constructs that enable students to learn. In this model, motivation was defined as a person's internal desire to complete a task based on interest, persistence, and approach regarding academic subjects (DiPerna & Elliott, 1999). Engagement, on the other hand, was defined as attention and active participation in classroom activities (DiPerna & Elliott, 2002). Similar to the self-system model of motivation, DiPerna and colleagues (2002) found that motivation leads to engagement. In other words, motivation is foundational to engaged behaviors. However, unlike the self-system model of motivation, the model of academic enablers does not clearly align to any theoretical perspectives previously discussed.

For their models, DiPerna et al. (2002) relied on the Academic Competence Evaluation Scales (ACES), which is a measure they created (DiPerna & Elliott, 1999). While an ACES – Student Rating exists for grades 6th through 12th, the model relied on a single-informant using the ACES – Teacher Rating for kindergarten through 12th grade. The ACES provide subscale ratings for both motivation and engagement. With regard to measurement, the ACES have adequate psychometric properties; test-retest reliability was between .88 and .97 for teachers. Internal consistency fell between .97 - .98 for teachers. Regarding validity, concurrent validity between academic performance and the teacher ACES rating fell between .31 and .87. The ACES demonstrates adequate psychometric properties for measuring academic enablers and skills, but narrowly aligned to DiPerna's model of academic enablers rather than broader theoretical perspectives.

Reeve's longitudinal model of engagement and motivation. Reeve and Lee (2014) conducted a longitudinal study to explore the relationship between engagement and motivation. Unlike the self-system model or the model of academic enablers, which suggest motivation is necessary for engagement, Reeve and colleagues hypothesized that engagement could influence motivation. Their hypothesis was founded in SDT, which posits that individuals who are self-determined transition from external to internal regulation (Ryan & Deci, 2000). The progression of internalization can be explained through four different levels: external, introjected (internal based on a feeling of requirement), identified (internal based on the usability of the behavior), and integrated regulation (internal based on one's own values; Ryan & Deci, 2000). Thus, increasing engagement could help facilitate internalization. In other words, while a student may start off engaged because of external expectations within the classroom, eventually that engagement could internalize based on an individual's values.

Similar to DiPerna and Elliott, Reeve and Lee (2014) relied on a single-informant. However, unlike in the model of academic enablers which relied on teachers as informants, Reeve's longitudinal model relied solely on students as informants. Additionally, Reeve and Lee relied on multiple measures of motivation and engagement within their model. In order to measure engagement, they used the behavioral engagement subscale of the EvsD. While the EvsD reports adequate psychometric properties for the full measure, it is important to note that the whole measure was not utilized. Regarding the measurement of motivation, PALS and the mastery goals scale from the Achievement Goal Questionnaire (AGQ) were used. PALS has an internal consistency that fell between .60 and .84, and a test-retest reliability between .34 and .61.

Additionally, convergent validity has been reported with goal questionnaires as falling between .63 and .67 (Fredricks et al., 2011; Skinner, Kindermann, & Furrer, 2009).

Lastly, the mastery goal subscales of the AGQ has reported internal consistency between .74 and .76, and discriminant validity between .3 and .51 (Finney, Pieper, & Barron, 2004). Reeve and Lee (2014) utilized multiple measures and theoretical perspectives to create their model; however, only particular subscales were used rather than full measures, undermining the psychometric properties.

MEW. Martin's (2007) original MEW was a model made up of 11 factors that fall within four quadrants: adaptive cognitions, adaptive behaviors, maladaptive behaviors and impeding cognitions. The adaptive cognitive dimension was made up of self-efficacy, mastery orientation, and valuing of school, while the adaptive behavioral dimension was made up of persistence, planning, and study management. Anxiety, failure avoidance, and uncertain control were factors within the impeding cognitive dimension. Lastly, maladaptive behavioral dimension was made up of disengagement and self-handicapping (Martin, 2007). According to Martin, motivation is defined as a set of beliefs and emotions that influence and guide behavior, while engagement is described through behavioral, emotional, and cognitive lenses (Way, Reece, Bobis, Anderson, & Martin, 2015). Despite defining these constructs, motivation and engagement are used interchangeably within this original model, treating them as the same construct.

Over the past decade Martin's MEW has undergone a series of modifications. In the most recent model, Martin and colleagues (2017) parsed apart engagement and motivation within the wheel. They replaced terminology of the four quadrants with adaptive motivation, adaptive engagement, maladaptive motivation, and maladaptive

engagement rather than considering positive and negative behavior and cognitions. Thus engagement is broken into adaptive (i.e., persistence, planning, and task management) and maladaptive (i.e., self-sabotage and disengagement) behaviors. Similarly, motivation is also separated into adaptive (i.e., self-belief, learning focus, and valuing) and maladaptive (i.e., anxiety, failure avoidance, and uncertain control) cognitions (see Figure 1).

In order to explore the distinctions between motivation and engagement, Martin et al. (2017) used confirmatory factor analysis (CFA) to examine four possible higher order factors. The main sample consisted of 5432 secondary students (grades 7th through 12th) from 12 different independent high schools. Just under half of the participants were female (43%) and 57% were male. The mean socioeconomic status of the participants was higher than the national average, with 8% of the sample from a non-English speaking background. For this population, it was determined that the four-factor structure, most aligned with the MEW, had superior fit ($\chi^2(885) = 8357$, CFI = 0.92, RMSEA = 0.039, SRMR = 0.060) in comparison to the positive and negative two-factor, the engagement and motivation two-factor, or the motivation/engagement single-factor higher order models. According to fit indices, both the four-factor and the positive and negative two-factor models yielded acceptable fit as demonstrated by $CF \geq 0.90$, $RMSEA \leq 0.08$, and $SRMR \leq 0.08$. However, the four factor higher order model had the best fit, demonstrating a statistically significantly different chi square ($\Delta\chi^2 = 1749$, $df = 5$, $p < 0.001$). While this study demonstrated that engagement and motivation are unique constructs, further examination and replication is necessary to confirm Martin's findings.

Similar to DiPerna's model of academic enablers, Martin and colleagues also relied on a single-informant through a single measure that was created by their own research team. The MES was used to measure students' perception of their engagement and motivation in all models of the MEW. The MES has demonstrated test-retest reliability between .61 and .81, and internal consistency between .70 and .87, as well as criterion related validity between .40 and .63 for achievement and academic outcomes (Fredricks et al., 2011; Liem & Martin, 2012). Thus, the MES appears to demonstrate adequate psychometric properties for measuring engagement and motivation, but similar to the ACES, the MES is narrowly aligned to MEW model.

The MEW encompasses multiple theoretical perspectives that most closely align to AGT and SCT. AGT, which focuses on goal orientation, aligns to the learning focus and failure avoidance factors found within the motivation quadrants. SCT on the other hand, focuses on the relationship between personal dynamics, environmental factors, and causal attributions. Within the MEW self-belief, persistence, anxiety, and uncertain control all fall within the SCT perspective. However, according to Martin et al. (2017) the MEW was also influenced by attribution theory, expectancy X value theory, and SDT. Thus, unlike other models of engagement and motivation that outline the direction of influence (i.e., motivation effects engagement, or engagement effects motivation), the MEW posits a reciprocal relationship between the two constructs. Therefore, the MEW was utilized in the current study because of the broad conceptualization of engagement and motivation, and incorporation of multiple theoretical perspectives.

Limitations of Current Models

Many of the models presented offer promising explanations for how motivation and engagement relate to one another in an educational context. However, there are a number of limitations to these models. These limitations provide an opportunity for further research to explore our understanding of motivation and engagement and how they relate to one another.

One limitation to existing models is the lack of replication. To date, the models presented above have not been replicated outside of the original research teams. Specifically for the MEW, which is the theoretical basis of the present study, Martin and colleagues have researched the factor structure of their model over the past decade. Despite the fact that they have run extensive studies across multiple countries, replication outside of their research team has not occurred. According to Tabachnick & Fidell (2013), replication is particularly important within CFA, the analyses used to compare models and their underlying factor structure. Beyond CFA, replication is an area of critical concern within the field and should be viewed as an essential aspect of science (Simons, Holcombe, & Spellman, 2014). Therefore, replication of theoretical models should be viewed as not only critical, but also foundational.

Another limitation is the fact that many of these models rely on a single-informant or single measure of engagement or motivation within their model. According to Maruyama (1998), using multiple measures for each construct is the only defensible way in which to create viable models. However, it is common for researchers to rely on a single measure to represent a latent variable as long as it is made up of at least the minimum number of recommended items. Martin and colleagues, for example, relied solely on their MES to build their model of motivation and engagement, while DiPerna

and Elliott relied on their ACES. Thus, violating Maruyama's recommendation for creating a defensible model. Relying on the MES is also problematic because it was created by Martin's team. Thus, the MES was created based on the MEW model rather than relying on measures of motivation and engagement to inform the construction of the model. For example, the MES includes items that are aligned to SDT (e.g., valuing), but the MES does not include any questions aligned to interest (another aspect of SDT). It is possible that interest still fits within their model under adaptive motivation, but has not been assessed due to relying solely on the MES when examining the structure of the MEW. Therefore, there is a need to not only replicate the MEW but also examine the adaptability of the model through including additional measures of adaptive and maladaptive motivation and engagement within the model.

Summary of Literature Review

Specific to engagement, AGT and flow theory described a multidimensional perspective of engagement (i.e., including both internal and external factors). The model of academic enablers, on the other hand, utilized the unidimensional perspective of engagement as on-task behaviors. While there is some overlap across theories of motivation and engagement, each theory provides a unique perspective of motivational patterns and engagement. Similarly, key components and terminologies associated with motivation and engagement varied across theories. Based on the theories and models presented, motivation can be described through goal setting, concept of self, desire, reward, interest, and expectancy of success. These components align to the terminologies outlined in a review conducted by Murphy and Alexander (2000), which included goals (e.g., AGT), intrinsic and extrinsic factors (e.g., SDT), interest (e.g., interest theories),

and concept of self (e.g., SCT) which were described as central terminologies associated with motivation. The current study aimed to capture these central components of engagement and motivation that are not assessed in the MES (e.g., desire, on-task behavior) in order to determine if they align with the four-factor higher-order structure of the MEW.

While each theory of motivation and engagement has distinct characteristics, there are a number of overlapping constructs across theories and models. For instance, individuals who are more aligned to mastery goal orientation tend to have higher self-efficacy, relating AGT and SCT. This makes sense given the reciprocal relationship described between self-efficacy and behavior; according to AGT, mastery oriented individuals are more likely to take on and persevere through challenging achievement tasks. Thus, the behaviors of mastery oriented individuals fuel the reciprocal relationship described in SCT increasing self-efficacy. Similarly, SDT, flow theory, and the expectancy X value model all emphasize the optimal level of performance based on motivation. Specific to the various interest theories, Eccles and Wigfield (2002) suggest that flow falls within the feeling-valence dimension of individual interest. Additionally, intrinsic and extrinsic motivation, which are primarily discussed in SDT, align to the concept of individual versus situational interests, respectively.

Regarding the relationship, in some instances engagement and motivation are seen as interchangeable (e.g., the original MEW; Martin, 2007). Other theories include engagement as a subcomponent of motivation (e.g., Self-System Model of Motivation; AGT). However, some theories conceptualize engagement and motivation as completely separate from one another (e.g., SCT; SDT). SDT is of particular interest because it

allows for an alternate directionality of the relationship between motivation and engagement. While other theories explain how motivation impacts engagement (e.g., AGT; attribution theory; Reschly & Christenson, 2012), SDT posits the concept that engaging tasks actually drive motivation (Reeve, 2012). Similarly, SCT discusses the reciprocal nature of self-efficacy and behaviors. Through this lens, motivational patterns and engagement continuously change through a cyclical relationship between concept of self, environmental factors, and actions, which influences both engagement and motivation, which aligns to the updated MEW (Martin et al., 2017). The current study examined the relationship between engagement and motivation through comparison of different higher-order models.

Gaps in the literature. There are a considerable number of questions remaining within educational literature that cannot fully be answered at the present time. First, there is no model that encompasses all underlying constructs of motivation and engagement across theoretical perspectives. However, Martin's updated MEW holds promise in that it incorporates multiple theoretical perspectives and 11 factors that make up adaptive and maladaptive motivation and engagement. There are a number of reviews of different theoretical perspectives, but there is little consensus across researchers as to the essential components of these constructs. The lack of agreement surrounding operational definitions has led to an abundance of misconceptions within the field. This is problematic because engagement and motivation as broad constructs are known predictors of academic achievement. In other words, engagement and motivation are essential to academic success (DiPerna & Elliott, 2002). However, how can educators

and researchers intervene to help foster growth in these areas if we continue to lack clear and consistent operational definitions or theoretical understanding?

Additionally, how do motivation and engagement truly relate to one another? The two constructs are often discussed in tandem, but are researched separately; there are separate interventions that focus on engagement and motivation, and separate measures for engagement and motivation. While multiple researchers have aimed to answer how motivation and engagement are related, there is little to no replication, with each research team reaching a different conclusion. For instance, DiPerna and Elliott (2002) used structural equation modeling in their model of academic enablers and concluded that motivation leads to engagement. Conversely, Reeve and Lee (2014) found that engagement can actually alter motivation. Most recently, Martin and colleagues (2017) concluded that engagement and motivation actually influence one another. In addition to the lack of replication, many of these studies relied on a single measure of engagement and motivation that was created by the same researchers; DiPerna and Elliott relied on the ACES, while Martin and colleagues utilized the MES. If motivation and engagement are as linked as theoretically believed, interventions could be optimized to target these constructs to help prevent the loss that occurs throughout adolescence (e.g., Archambault et al., 2009; Harter, 1981).

Summary

The literature surrounding motivation and engagement is extensive, but also chaotic. Despite clear associations between engagement, motivation, and academic achievement, there is confusion surrounding the conceptualization of both engagement and motivation. Operational definitions of these constructs not only differ across theories,

but often are not explicit. However, in synthesizing various theories and models of motivation and engagement, patterns emerge; both engagement and motivation are typically considered from a multidimensional perspective. Thus, engagement is conceptualized to include both internal and external components, while motivation is best described through a synthesis of various theoretical perspectives. In other words, there is no single underlying component that fully captures motivation or engagement, but instead a number of subcomponents that can be used to help conceptualize these constructs. Thus, there is a need for additional research that not only replicate previous findings, but also utilizes multiple measures to better understand the relationship between motivation and engagement. The primary purpose of the current study was to examine the higher order structure of the MEW, a model that encompasses multiple theoretical perspectives, by replicating the models presented by Martin et al. (2017) with a more diverse, and elementary-aged American sample. Secondly, this study aimed to capture additional components of adaptive and maladaptive engagement and motivation by including additional measures of these constructs, beyond what was used by Martin and colleagues.

CHAPTER 3

Method

Setting

Data collection took place at two elementary schools (grades pre-kindergarten through sixth) in an urban area within the Midwestern United States. According to 2017-2018 school data for the first school, there were 338 students, in which 85% were African American, and 15% were Hispanic. For the second school, which had 381 students, 37% of students were African American, 31% were White, 13% were Asian, and 10% were Hispanic. Additionally, 96% of the students at the first school were identified as coming from a low-income background as determined by the percentage of students who received free or reduced price lunch. For the second school, 66% of students were identified as coming from a low-income background and 12% had limited English proficiency.

Participants

Participants were recruited at the classroom level. Thus, teachers of 3rd through 6th grade students were first recruited for participation. After teachers were recruited, students in their class were then recruited for participation. To this end, parents first received a passive consent form, which determined which students were eligible to participate. Parents who signed and returned the opt-out form if they did not want their child to participate. Students whose parents opted-out of participating were provided with an alternative activity (e.g., reading time, work-sheet) while the class completed the questionnaire. Finally, prior to the start of the study, student assent was obtained from those students for whom parental passive consent was obtained. Students were not given

any incentive for participating in this study. However, participating teachers received a \$10 gift card as compensation for their time completing study measures.

Thus, there were 360 potential participating students and 16 teachers initially recruited for study participation. However, one teacher did not agree to have her class participate (potential student $n = 340$), 14 parents waived consent, seven students did not assent, 16 discontinued after starting, 15 were absent, and there were 18 technological errors. Thus, 270 students and 15 teachers were included in the final sample. See Table 1 for demographic information of the final sample.

Procedures

Data were collected using a multi-informant and multi-method design, allowing for in-depth analysis of both children and teachers' perspectives of academic engagement and motivation. Data were collected at a single time point during the spring of 2018. The primary method of data collection involved teacher and student questionnaires administered using Qualtrics on iPads. Teacher questionnaires were made up of a single measure (Engagement Versus Disaffection with Learning-teacher report [EvsD]) with 25 items per student, while student questionnaires included three measures (Motivation and Engagement Scale [MES], EvsD-student report, and Patterns of Adaptive Learning Scale [PALS]) consisting of a total of 129 items. The order of the measures within the student questionnaires were randomized across classrooms, creating multiple versions of the student questionnaires in an effort to guard against potential order effects.

The questionnaire was administered class-wide so all participating students completed the measures at the same time on iPads. The student questionnaire took approximately 40 minutes to complete. Additionally, trained graduate students

administered the student questionnaires and read the items out loud in order to help students comprehend each item and respond to the best of their abilities. Teachers were asked to complete questionnaires for each individual student, in a randomly assigned order. Teacher questionnaires were completed while the graduate students administered the student questionnaire.

Measures

Student demographic information was obtained through the district online portal, and teachers completed a demographic questionnaire to gather information such as their level of education and number of years teaching (see Appendix B). Four measures of motivation and engagement were used to capture students' engagement and motivation: MES, EvsD – teacher report and student report, and PALS. Each of these measures has been validated with upper elementary aged students and captures both adaptive and maladaptive components of motivation and engagement, therefore aligning to Martin's model theoretically.

MES. Martin's (2016) MES – Junior School is a student self-report measure for elementary aged students that assesses adaptive motivation, adaptive engagement, maladaptive motivation, and maladaptive engagement. The MES measures 11 subscales that are grouped under four scales—self-belief (e.g., “If I try hard, I believe I can do my schoolwork well”), learning focus (e.g., “I feel very pleased with myself when I really understand what I am taught at school”), and valuing (e.g., “Learning at school is important to me;” adaptive motivation); persistence (e.g. “If I can't understand my schoolwork at first, I keep going over it until I understand it”), planning (e.g., “Before I start an assignment I plan out how I am going to do it”), and task management (e.g.,

“When I study, I usually study in places where I can concentrate;” adaptive engagement); anxiety (e.g., “When exams and assignments are coming up, I worry”), failure avoidance (e.g., “Often the main reason I work at school is because I don’t want to disappoint my parents”), and uncertain control (e.g., “I’m often unsure how I can avoid doing poorly at school;” maladaptive motivation); and self-sabotage (e.g., “I sometimes don’t study very hard before exams so I have an excuse if I don’t do as well as I hoped”) and disengagement (e.g., “I often feel like giving up at school;” maladaptive engagement; see Appendix C for the full measure). Students provided a rating for each item on a Likert scale (1 = *strongly disagree* and 5 = *strongly agree*). The MES provides scores for the eleven subscales and four scales, where higher scores are better for the adaptive factors and lower scores are better for the maladaptive factors. The MES – Junior School takes approximately 10 minutes to administer and has been validated for students between the ages nine and 13 (Martin, 2016). Research has demonstrated adequate test-retest reliability (.61-.81) and internal consistency (.70-.87), as well as criterion related validity (.40-.63) for achievement and academic outcomes (Fredricks et al., 2011; Liem & Martin, 2012).

EvsD. In addition to the MES, teachers and students completed the EvsD. The EvsD includes four subscales for both the teacher and student reports: behavioral engagement (e.g., “I try hard to do well in school”), behavioral disaffection (e.g., “When I’m in class, my mind wanders”), emotional engagement (e.g., “When we work on something in class, I get involved”), and emotional disaffection (e.g., “When we start something new in class, I feel nervous;” see Appendices D and E for the full measures). For each item, respondents used a 4-point Likert-type scale: ranging from 1 (not at all

true) to 4 (very true). The EvsD, which was designed for students between the ages of eight and 13, has demonstrated strong internal consistency for the teacher report (.81-.87), but more variable internal consistency for the student report (.61-.85). Test-retest reliability was also higher for the teacher report (.65-.82) compared to the student report (.53-.68). Additionally, adequate evidence of criterion related validity has been demonstrated for both the teacher report (.50-.81) and the student report (.34-.61; Fredricks et al., 2011; Skinner et al., 2009).

PALS. Students also completed the PALS student self-report. The PALS Personal Achievement Goal Orientations includes three scales: Mastery Goal Orientation (e.g., “It’s important to me that I improve my skills this year”), Performance-Approach Goal Orientation (e.g., “It’s important to me that I look smart compared to others in my class”), Performance-Avoid Goal Orientation (e.g., “One of my goals in class is to avoid looking like I have trouble doing the work”). The PALS Academic-Related Perceptions, Beliefs, and Strategies includes 8 scales: Academic Efficacy (e.g., “I am certain I can master the skills taught in class this year”), Academic Pressure (e.g., “When I’ve figured out how to do a problem, my teacher gives me more challenging problems to think about”), Academic Self-Handicapping Strategies (e.g., “Some students purposely don’t try hard in class. Then if they don’t do well, they can say it is because they didn’t try. How true is this of you?”), Avoiding Novelty (e.g., “I would prefer to do class work that is familiar to me, rather than work I would have to learn how to do”), Cheating Behavior (e.g., “I sometimes cheat on my class work”), Disruptive Behavior (e.g., “I sometimes get into trouble with my teacher during class”), Self-Presentation of Low Achievement (e.g., “One of my goals in class is to avoid looking smarter than other kids”), and Skepticism

About the Relevance of School for Future Success (e.g., “My chances of succeeding later in life don’t depend on doing well in school;” see Appendix F for the full scales). PALS uses five point Likert-type scales: items are anchored at 1 = “Not at all true,” 3 = “Somewhat true,” and 5 = “Very true.” The PALS has been validated with students between the ages of six and 18. It has demonstrated adequate internal consistency (.60-.84), and test-retest reliability (.34-.61). Additionally, convergent validity has been demonstrated with alternate goal questionnaires (.63-.67; Midgley et al., 2000).

Data Analysis Plan

Descriptive analyses. Before testing the CFA, preliminary descriptive analyses were conducted using R version 1.0.136 and Jamovi version 0.9.5.15 to examine descriptive statistics. Distribution of variables were examined using graphs to address potential problems with outliers and account for skewed distribution. Additional analyses were conducted to ensure no statistically significant differences based on the order of questionnaire completion or other demographic features were present. Lastly, correlation matrices for all subscales were calculated in order to create measurement models for the additional measures of engagement and motivation (i.e., EvsD teacher and student reports, and PALS).

Structural Equation Modeling. To assess the measurement models, CFA were performed through MPlus 8.1 on the four measures presented above. CFA were conducted following Rindskopf and Rose’s (1998) method of comparing nested models. Models were tested by comparing the fit of least to most restrictive competing models. While maximum likelihood estimation is most commonly used, it is only appropriate for normally distributed continuous data. Therefore, robust weighted least squares

(WLSMV) estimation was used to estimate the model parameters because it is robust against smaller sample sizes and variables with floor or ceiling effects and is the best estimator for categorical data (Brown, 2014).

Primary analysis: Proposed replication models. Four higher-order models were tested based upon models used by Martin et al. (2017). The hypothesized path diagrams are presented in Figures 2 through 5 in order of their restrictiveness, where circles represent higher-order latent variables and ovals represent first-order factors. Absence of a line connecting variables implies no hypothesized direct effect, while a curved line represents a correlation.

- 1) Higher-Order Single-Factor Model of Motivation/Engagement (Figure 2): This model hypothesized the presence of a combined motivation/engagement higher-order factor, which all 11 first-order factors load on (i.e., self-belief, learning focus, valuing, persistence, planning, task management, anxiety, failure avoidance, uncertain control, self-sabotage, and disengagement).
- 2) Higher-Order two-factor Model of Adaptive and Maladaptive Qualities (Figure 3): This model hypothesized two higher order factors, Adaptive and Maladaptive behaviors and cognitions. Six first-order factors load on the Adaptive factor (i.e., self-belief, learning focus, valuing, persistence, planning, and task management), while five first-order factors load on the Maladaptive factor (i.e., anxiety, failure avoidance, uncertain control, self-sabotage, and disengagement).
- 3) Higher-Order two-factor Model of Motivation and Engagement (Figure 4): This model hypothesized two factors, Motivation and Engagement. Six first-order factors load on the Motivation factor (i.e., self-belief, learning focus, valuing,

anxiety, failure avoidance, and uncertain control), and five first-order factors load on the Engagement factor (i.e., persistence, planning, task management, self-sabotage, and disengagement).

4) Higher-Order four-factor Model of Adaptive Motivation, Adaptive Engagement, Maladaptive Motivation, and Maladaptive Engagement (Figure 5): This model hypothesized four factors, Adaptive Motivation, Adaptive Engagement, Maladaptive Motivation, and Maladaptive Engagement. Three first-order factors load on the Adaptive Motivation (i.e., self-belief, learning focus, and valuing), Adaptive Engagement (i.e., persistence, planning, and task management), and Maladaptive Motivation (i.e., anxiety, failure avoidance, and uncertain control), while two factors load on Maladaptive Engagement (i.e., self-sabotage, and disengagement).

Secondary analysis: Proposed adaptability models. Four higher-order models were tested based upon models used by Martin et al. (2017), but including alternate subfactors of engagement and motivation as measured by PALS and EvsD. The hypothesized path diagrams are presented in Figures 6 through 9 in order of their restrictiveness.

5) Higher-Order Single-Factor Model of Motivation/Engagement (Figure 6): This model hypothesized the presence of a combined motivation/engagement higher-order factor, which 19 first-order factors load on (i.e., teacher and student rated emotional engagement, mastery goal orientation, performance-approach goal orientation, academic efficacy, teacher and student rated behavioral engagement, academic press, teacher and student rated emotional disaffection, performance-

avoid goal orientation, avoiding novelty, self-presentation of low achievement, skepticism about relevance of school for future success, teacher and student rated behavioral disaffection, academic self-handicapping, cheating behavior, and disruptive behavior).

2) Higher-Order two-factor Model of Adaptive and Maladaptive Qualities

(Figure 7): This model hypothesized two higher order factors, Adaptive and Maladaptive behaviors and cognitions. Seven first-order factors load on the Adaptive factor (i.e., teacher and student rated emotional engagement, mastery goal orientation, academic efficacy, teacher and student rated behavioral engagement, academic press), while twelve first-order factors load on the Maladaptive factor (i.e., teacher and student rated emotional disaffection, performance-approach goal orientation, performance-avoid goal orientation, avoiding novelty, self-presentation of low achievement, skepticism about relevance of school for future success, teacher and student rated behavioral disaffection, academic self-handicapping, cheating behavior, and disruptive behavior).

3) Higher-Order two-factor Model of Motivation and Engagement (Figure 8):

This model hypothesized two factors, Motivation and Engagement. Eleven first-order factors load on the Motivation factor (i.e., teacher and student rated emotional engagement, mastery goal orientation, performance-approach goal orientation, academic efficacy, teacher and student rated emotional disaffection, performance-avoid goal orientation, avoiding novelty, self-presentation of low achievement, skepticism about relevance of school for future success), and eight

first-order factors load on the Engagement factor (i.e., teacher and student rated behavioral engagement, academic press, teacher and student rated behavioral disaffection, academic self-handicapping, cheating behavior, and disruptive behavior).

4) Higher-Order four-factor Model of Adaptive Motivation, Adaptive Engagement, Maladaptive Motivation, and Maladaptive Engagement (Figure 9):

This model hypothesized four factors, Adaptive Motivation, Adaptive Engagement, Maladaptive Motivation, and Maladaptive Engagement. Four first-order factors load on Adaptive Motivation (i.e., teacher and student rated emotional engagement, mastery goal orientation, academic efficacy). Three first-order factors load on Adaptive Engagement (i.e., teacher and student rated behavioral engagement, academic press). Seven first-order factors load on Maladaptive Motivation (i.e., teacher and student rated emotional disaffection, performance-approach goal orientation, performance-avoid goal orientation, avoiding novelty, self-presentation of low achievement, skepticism about relevance of school for future success), and five factors load on Maladaptive Engagement (i.e., teacher and student rated behavioral disaffection, academic self-handicapping, cheating behavior, and disruptive behavior).

Difference tests and χ^2 probability were used to assess model fit. A χ^2 that is not statistically significant suggests that the hypothesized model does not differ from the population model meaning that the model fits the population of students. Model fit was assessed with the following goodness-of-fit criteria:

1) Comparative fit index (CFI): A ratio of the fit of the estimated model over the

null hypothesis model where the closer to 1.0 the better the fit (Brown, 2014).

Values greater than .90 indicate an adequate fit and values above .95 indicate a good fit (Hu & Bentler, 1999; Tabachnick & Fidell, 2013).

2) Root mean square error of approximation (RMSEA): A calculation of the lack of a good fit in comparison to the ideal model, where the closer to 0 the better the fit (Brown, 2014). RMSEA values equal to or below .08 indicate an adequate fit, values equal to or below .06 indicate a good fit, and values equal to or below .05 indicate excellent fit (Browne & Cudeck, 1993, Hu & Bentler, 1999; Schumacker & Lomax, 2010).

3) Standardized root mean square residual (SRMR): A calculation similar to RMSEA, where the closer to 0 the better the fit. SRMR values equal to or below .08 indicate close fit, while a value equal to or below .05 indicates excellent fit (Schumacker & Lomax, 2010).

Chi-squared difference tests were used to determine if the nested models were a statistically significant improvement over the baseline model. In the case of χ^2 difference tests, a statistically significant finding suggests an improved model fit. Models that resulted in statistically significant improvement over the baseline model were compared and the final model was determined by the best overall fit indices.

CHAPTER 4

Results

Analytic Assumptions

Based on the number of parameters within the models, the initial objective was a sample size of a minimum of 300 student participants. Despite fewer participants than anticipated (i.e., $n = 270$), two separate analyses confirmed the sample size was adequate for the replication models: Bartlett's test of Sphericity [$X^2(946) = 4951, p < .001$] and Kaiser (KMO) measure of sampling adequacy (all items $< .6$ indicating adequate). Sample size was smaller for the adaptability models due to the fact that it included teacher surveys. Based on teacher response, only 185 students were included for the adaptability models. Thus, KMO indicated some items $> .6$. However, Bartlett's Sphericity still indicated adequate sample size, $X^2(5995) = 13,529, p < .001$. Based on a Little's MCAR test that was not statistically significant, data appeared to be missing completely at random. Additionally, logistic regression was implemented with dummy coded items (i.e., missing data were coded as 1 while non-missing were coded as 0), which indicated neither school, grade, race, nor order of measures predicted missingness ($p > .05$ across all items). In other words, data were missing with no clear pattern of clustering based on demographics. Because less than 1% of data were missing, missing data were left empty and pairwise deletion was utilized, which is recommended with WLSMV estimation.

Normality of variables was assessed by visually examining histograms using R Studio and by calculating standardized skewness and kurtosis statistics (see Tables 2-6). Skewness and kurtosis were present across measures. However, this was expected given

the nature of the scales (i.e., it was expected that students would rate their positive motivation and engagement higher and their negative motivation and engagement lower). Consequently, WLSMV estimation was used, which is recommended for both smaller sample sizes and non-normal data. Linearity was assessed using scatterplots and best-fit lines – variables appeared to be linearly related.

Descriptive Statistics and Correlations

Multiple linear regression analyses were used to assess any statistically significant differences in motivation and engagement, as measured by the MES, EvsD, and PALS, based on race, grade level, gender, school, and the order measures were presented. Race ($\beta = -0.02, p > .05$), grade level ($\beta = -0.02, p > .05$), biological sex ($\beta = 0.01, p > .05$), school ($\beta = 0.04, p > .05$), and order the measures were presented ($\beta = -0.01, p > .05$) were not statistically significant predictors of engagement and motivation. The overall model fit was $R^2 = 0.01$.

Across measures, students rated their Adaptive Engagement and Motivation higher and their Maladaptive Engagement and Motivation lower. On the MES, which provided raw scores out of 5 and converted scores out of 100, the average subscale scores and Cronbach's alphas from the current sample aligned to Martin's (2016) sample. On average, subscale scores differed by only 1.5 for the converted scores out of 100 across the two samples; the largest average score difference was found in the Valuing subscale in which the current sample had a Mean of 84 (raw score = 4.20) compared to an average of 89 (raw score = 4.45) for Martin's sample, while some subscales demonstrated no difference across samples (i.e., Self-Belief and Task Management). Differences between Cronbach's alpha coefficients were also minimal across samples with alphas ranging

between questionable ($.6 \leq \alpha < .7$) and good ($.8 \leq \alpha < .9$), with the majority of alpha coefficients falling in the adequate range ($.7 \leq \alpha < .8$); see Table 2). Similar results (i.e., higher positive and lower negative components of motivation and engagement and adequate alpha coefficients) were found on the student and teacher EvsD and PALS measures. For information regarding average subscale and scale scores and Cronbach's alpha coefficients across measures see Table 3. For more detailed descriptive statistics by item, see Tables 4 through 7.

Tables 8 through 11 present the Pearson's correlation matrices for the subscales of the four measures by adaptive and maladaptive motivation and engagement. Most of the subscales demonstrated statistically significant correlations with one another, with the exception of some scales from the teacher EvsD. The MES and student EvsD demonstrated statistically significant ($p < .001$) and moderate correlations ($r = 0.39 - 0.61$) across subscales. Additionally, both were weakly to moderately correlated with subscales of the PALS ($r = 0.04 - 0.65$).

Confirmatory Factor Analysis

Based on the research questions that asked which higher-order structure, as replicated from models proposed by Martin and colleagues (2017), best fits an American, elementary aged population across various measures, we examined eight possible higher order factor structures using CFA. Evidence of motivation and engagement as distinct constructs would be indicated by superior fit for the multi-factor higher order models.

Replication models. Four replication models were run to assess the higher order structure behind motivation and engagement. Model 1, which was a single-factor higher order model that combined engagement and motivation, was run first in order to allow for

model comparisons. Fit indices for Model 1 indicated poor fit, $\chi^2(891) = 2372$, CFI = 0.86, RMSEA = 0.08, SRMR = 0.10. Model 2, a two-factor higher order model that separated adaptive and maladaptive constructs, yielded $\chi^2(890) = 1981$, CFI = 0.90, RMSEA = 0.07, SRMR = 0.09. Model 3, a two-factor higher order model that separated engagement and motivation yielded $\chi^2(890) = 2354$, CFI = 0.86, RMSEA = 0.08, SRMR = 0.10. Lastly, Model 4, a four-factor higher order model that separates engagement and motivation into adaptive and maladaptive constructs yielded $\chi^2(885) = 1577$, CFI = 0.94, RMSEA = 0.05, SRMR = 0.08. Despite statistically significant χ^2 , indicating that the models do not fit the population, the four-factor and two-factor adaptive and maladaptive model yielded acceptable fit (CFI \geq 0.90, RMSEA \leq 0.08, and SRMR \leq 0.08) on additional fit indices. Of these two models, the hypothesized four-factor higher order model (Model 4) fit best, as determined by a statistically significantly different chi square ($\Delta\chi^2 = 175$, df = 5, $p < 0.001$). Standardized factor loadings and errors for Model 4 are presented in Tables 12 and 13, and Figure 10 presents the final model with standardized coefficients.

Adaptability models. In order to answer the second research question, four additional adaptability models, with the same higher order structure as the replication models, were run. Model 5, a single-factor higher order model that combined engagement and motivation could not converge. Model 6, a two-factor higher order model that separated adaptive and maladaptive constructs yielded $\chi^2(5865) = 9769$, CFI = 0.89, RMSEA = 0.05, SRMR = 0.14. Model 7, a two-factor higher order model that separated engagement and motivation could not converge. Lastly, Model 8, a four-factor higher

order model that separates engagement and motivation into adaptive and maladaptive constructs yielded $\chi^2(5860) = 9696$, CFI = 0.90, RMSEA = 0.05, SRMR = 0.14. While two of the models were unable to converge, the four-factor and two-factor adaptive and maladaptive model yielded estimates and met criteria for adequate fit in at least a single fit index. Of these two models, the hypothesized four-factor higher order model fit best, as determined by a statistically significantly different chi square ($\Delta\chi^2 = 93$, $df = 5$, $p < 0.001$). Standardized factor loadings and errors are presented in Tables 14 and 15, and Figure 11 presents the final model with standardized coefficients.

CHAPTER 5

Discussion

The primary purpose of this study was to examine the relationship between adaptive and maladaptive engagement and motivation by replicating the models presented by Martin et al. (2017) with a more diverse, and elementary aged American sample to assess the four-factor higher-order model that represents the MEW. Specifically, it investigated if a model with adaptive engagement, adaptive motivation, maladaptive engagement, and maladaptive motivation as four separate constructs had better fit in comparison to models that combined adaptive and maladaptive engagement and motivation. In order to strengthen the MEW as a theoretical model and our conceptualization of positive and negative engagement and motivation, this study secondarily aimed to examine how additional components of these constructs, beyond those included in the current MEW, fit within the four-factor structure proposed by Martin and colleagues.

Engagement Versus Motivation: How Many Constructs?

Of the four models replicated from Martin and colleagues (2017), the two-factor adaptive and maladaptive model (Model 2) and four-factor model (Model 4) indicated adequate fit for at least two fit indices. Although χ^2 values were statistically significant across models, indicating models did not fit, χ^2 are impacted by several factors (e.g., sample size, correlations) and are often criticized for having compromised statistical significance (Brown, 2014). Thus, additional fit indices for absolute fit (i.e., SRMR), parsimony correction (i.e., RMSEA), and comparative fit (i.e., CFI) were included. Based on these additional fit indices, Model 2 demonstrated adequate fit based on RMSEA and

CFI, while Model 4 demonstrated adequate fit based on CFI, close fit based on SRMR, and excellent fit based on RMSEA. In other words, the four-factor model (Model 4) indicated better fit across the different fit indices. Additionally, $\Delta\chi^2$ indicated Model 4 was a statistically significantly better fit compared to Model 2. Thus, findings from the current study replicated Martin and colleagues' (2017) outcomes, indicating adaptive engagement, adaptive motivation, maladaptive engagement and maladaptive motivation are four separate constructs.

Despite demonstrating better fit compared to the single-factor model (Model 1), the two-factor model that conceptualized engagement and motivation as separate constructs (Model 3) did not yield adequate fit. While this corresponded with findings from Martin and colleagues (2017), it is still thought-provoking. The overlap between engagement and motivation, and the components of these constructs, is widely recognized (e.g., Fredricks et al., 2004; Martin, 2012; Martin et al., 2017). However, conceptualizing these constructs as highly related, but separate factors has become more prevalent (Reschly & Christenson, 2012). While current findings show support for the separation of engagement from motivation, as indicated by Model 4's superior fit, results also suggest the interconnectedness of these constructs (as indicated by the lack of fit in Model 3). In other words, it was not until the positive and negative constructs were separated that the differentiation between engagement and motivation was evident. This is particularly interesting because theories of motivation and engagement typically do not explicitly discuss maladaptive components of these constructs (e.g., SCT and SDT). Thus, one possible explanation is that the inclusion of the maladaptive components in the current model interfered with the precision of engagement or motivation as latent factors.

In other words, the inclusion of the negative components of engagement and motivation created constructs that were too expansive, which therefore did not fit as independent latent factors. It is possible that engagement and motivation would still be best explained as separate constructs if they were defined and measured in a way that was more theoretically aligned (i.e., only including positive aspects of these constructs), but the current study did not explore this further. However, the current study did highlight the information gained, and importance of the inclusion of maladaptive aspects of these constructs, as demonstrated by the superior fit of Model 4.

Findings from the replication models, aligned to the first research question, were important for a number of reasons. First, neither the original nor the updated MEW has been replicated outside of the original research group. Additionally, replication is particularly critical with CFA due to the influence of the sample on factor analytic techniques (Tabachnick & Fidell, 2013). Lastly, replication is an essential component to research. Recently, psychology has been faced with a “replication crisis.” A lack of replication undermines findings and limits our understanding for whom and under what conditions conclusions can be drawn. This is the first study that has examined the higher order relationship between adaptive and maladaptive engagement and motivation for a diverse sample. Martin et al. (2017) noted that their sample, which was made up of mostly White upper-class Australians, was a limitation to their findings and replicating their models with a more diverse population was suggested as a next step for research. Thus, findings from the current study extend Martin’s findings, allowing us to expand the representation of the MEW.

The findings from the current study also indicate that the relationship between

these constructs may be stable across age. While Martin and colleagues focused on a secondary population, the current study utilized an elementary aged sample. The fact that the results replicated is particularly interesting given our current understanding of the development of both engagement and motivation; engagement and motivation have been shown to decrease from childhood into adolescence (e.g., Eccles et al., 1993; Greenwood, 2002; Harter, 1981). However, there have not been studies to date that have explored how or if the relationship between these constructs differs throughout development. Findings from the current study support the notion that engagement and motivation could endure a similar relationship over time, despite decreases in engagement and motivation across development.

Beyond the MES: Additional Measures for the MEW

While the primary research question focused on replication supporting the structure of the MEW, the secondary research question aimed to provide additional support for the MEW as a theoretical model through supplementing alternative measures of adaptive and maladaptive motivation and engagement. Of the four adaptability models, the two-factor adaptive and maladaptive model (Model 6) and four-factor model (Model 8) were the only models that produced estimates; the single-factor (Model 5) and two-factor engagement and motivation (Model 7) models did not converge. A lack of convergence could occur for a number of reasons (e.g., complexity or grossly misspecified models; Brown, 2014). Thus, it is likely that Models 5 and 7 would have poor-fit. A number of adaptations were attempted in order to encourage convergence (i.e., increasing the maximum number of iterations, co-varying variables that were theoretically and statistically related). However, Models 5 and 7 failed to converge across

attempts. Both the two-factor adaptive and maladaptive (Model 6) and four-factor higher order model (Model 8) had adequate fit based on RMSEA and CFI. Of the two fitted models, Model 8 yielded a statistically significant improvement over Model 6. Thus, in alignment to the replication models, the four-factor higher order structure best represented the sample.

Theoretically speaking, the components captured by the EvsD and PALS were well aligned to the underlying theories that are foundational to the MEW. For instance, goal orientation—captured by the Mastery Goal Orientation and Performance-Approach Goal Orientation subscales in the PALS—aligns to AGT, SCT, and SDT, which were foundational to the conceptualization of the MEW. Additionally, the subscales of the adapted measures were statistically significantly correlated with subscales from the MEW. Thus, it was expected that alternative measures would fit the four-factor structure of Martin’s MEW model; a hypothesis that was supported by current findings (i.e., Model 8 demonstrated superior fit).

The findings from the adaptability models provided insight on the malleability of the MEW, but should be interpreted with caution. Based on these preliminary findings, it appears that the four-factor structure of the MEW is upheld even without the inclusion of the MES measure. This is of interest for a number of reasons. First, the MEW has previously relied solely on the MES measure, which is potentially problematic because MES was developed by Martin’s research team. According to Maruyama (1998), utilizing multiple measures for each construct is the most defensible way in which to create viable theoretical models. Thus, while the MEW is referred to as a theoretical model, it has not previously met the criteria; instead, it is more aligned to a model of the

MES measure. Including measures that are not directly derived from the MEW provided further validation of the MEW as a theoretical model by demonstrating its adaptability across measures of engagement and motivation. Additionally, the adaptability models included multiple sources of information; both student and teacher's responses were captured in the model. Models can be strengthened by utilizing multiple measures and multiple sources to represent latent variables. Thus, these findings could enhance our understanding and application of the MEW, allowing a better understanding of how this theoretical model bridges multiple conceptualizations of engagement and motivation.

Future Research Directions and Limitations

While this study provided additional support for the four-factor higher order MEW model across various measures of motivation and engagement, there are several limitations that must be considered and recommendations for future research. First, the current study ended up with a lower than expected sample size ($n = 270$ for replication and $n = 185$ for adaptability). While this met the threshold of acceptability from some perspectives, it would be considered lower than advisable based on other rules of thumb (Brown, 2014). Hence, findings should not be interpreted outside the context of the sample and methodology used in the current study, especially with the adaptability models. Additional research is necessary to replicate these preliminary findings, ideally with a larger sample size. The current study only included an elementary aged sample. Therefore, there is a need for further replication with secondary students from researchers not associated with Martin. Additionally, despite using a racially diverse sample, the majority of participants were from a low-income background so there is still a need to examine the impact of SES on engagement and motivation.

The current study did not examine the directionality of the relationship between positive and negative engagement and motivation. Future research should utilize longitudinal methods to explore the potential cyclical relationship between these constructs. While other models have explored the impact engagement and motivation have on each other (e.g., DiPerna or Reeve's models), the directionality within the MEW has not yet been explored.

Another limitation was the use of iPads to gather responses across the PALS, MES, and EvsD measures. While these measures are psychometrically sound, they are typically completed in paper-pencil format and have not been validated in an online format. Thus, while measurement equivalence was assumed, it is possible that the use of an online survey completed on an iPad could have impacted the psychometric properties of these measures. The international test commission recommends any new version of a measure, even including a change in format, should be evaluated for psychometrics separately. However, a number of studies have compared online to paper-pencil self-reports and found no statistically significant differences between the formats and that online versions can be used with confidence (e.g., Carlbring et al., 2007; Holländare, Andersson, & Engström, 2010).

Another possible limitation of the current study is the reliance upon self-report to measure student engagement and motivation. The current study attempted to balance this by including teacher-ratings of students' motivation and engagement, however most of the measures were self-report. While self-report forms are the most common measures of both engagement and motivation, there can be developmental issues depending on the age range or cognitive ability of respondents, which can negatively impact validity

(Fulmer & Frijters, 2009). Although, issues like social desirability may impact responses to self-report measures (Devellis, 2003), research has indicated that social desirability bias is not as problematic with low-risk items such as those found in engagement or motivation questionnaires (e.g., Miller, 2012). However, there are still issues of interpretation for both self-report and ratings; it is possible that the individual completing a measure interpreted an item differently from how the researcher or author intended.

While this study replicated and examined the higher order structure of Martin's (2017) analysis, it did not examine the first order factors. Many of the observed variables were strongly correlated. Thus, it is possible that the observed variables could load into different first order factors. This is especially true for the adaptability models. While Martin's research team has extensively researched the first order factor structure, the current study relied on theoretical alignment to categorize the subscales of the different measures into higher-order factors. Measurement models were used to support theoretical alignment, but alternate first-order structures were not explored. Lastly, this study was largely theoretical in nature and lacked explicit alignment to school based interventions. Future research should explore the impacts of these different elements of adaptive and maladaptive engagement and motivation on students' education.

Practical implications

Given the influence engagement and motivation have on academic achievement, it is of particular interest to better understand these constructs and how they relate to one another from both theoretical and applied perspectives. Findings from the current study are of particular interest in practice because it will allow educators to better understand students' specific areas of need. In other words, altering the conceptualization of

engagement and motivation to include adaptive and maladaptive components will allow educators to create more precise and well-matched interventions and strategies for working with students. For instance, it is possible for a student to have high adaptive motivation, but also have high maladaptive motivation. Thus, while many educators might automatically choose an intervention that focuses on increasing motivation in general, a more targeted intervention for decreasing maladaptive motivation could be more efficient and effective for that individual student. Future research should explore this possibility further.

Conclusion

This study was the first replication, outside of the original research team, of Martin and colleagues' (2017) examination of the higher-order structure of the MEW. Overall, results indicated that the four-factor higher order structure, which separated adaptive engagement, adaptive motivation, maladaptive engagement, and maladaptive motivation into individual constructs, demonstrated the best fit for a diverse, American, elementary-aged sample, thus replicating findings from Martin. Secondly, this study aimed to examine the adaptability of the MEW by including additional measures of motivation and engagement. Based on the hypothesized adaptability models, the four-factor higher order structure demonstrated best fit despite not including the MES. This supports the hypothesis that the MEW can be adapted to include alternate components of positive and negative engagement and motivation, thus strengthening the notion that the MEW is a theoretical model. However, there was no way to compare the fit of the replication and adaptability models because of the method of estimation used for the current analysis. It is recommended that future research continues to validate the structure

and adaptability of the MEW and explore the impacts of various interventions on these distinct components of motivation and engagement in order to better understand how this theoretical model can be applied in schools.

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Table 1

Demographic Information for the Sample

Characteristics	Frequency	Percentages
Biological Sex		
Male	158	56%
Female	124	44%
Year in School		
Third	80	28.4%
Fourth	97	34.4%
Fifth	84	29.8%
Sixth	21	7.4%
School		
School 1	135	47.9%
School 2	147	52.1%
Race/Ethnicity		
Asian	16	5.7%
Black/African American	190	67.4%
Caucasian	52	18.4%
Hispanic/Latino	30	10.6%
Other	4	1.4%

Table 2

Comparing Means and Cronbach's alphas for Subscales of MES Across Samples

Factor	Sub-Factor	<i>M (SD)</i>		Cronbach's α	
		Current Sample	Martin's Sample	Current Sample	Martin's Sample
Adaptive	Self-Belief	86 (16.1)	86 (14.0)	.83	.77
Motivation	Learning Focus	84 (16.1)	86 (14.1)	.82	.82
	Valuing	84 (17.4)	89 (12.4)	.79	.75
Adaptive	Persistence	79(16.0)	78 (15.2)	.74	.77
Engagement	Planning	73 (19.5)	74 (18.7)	.79	.85
	Task Management	79 (19.6)	79 (18.5)	.82	.86
Maladaptive	Anxiety	60 (20.8)	61 (18.5)	.73	.66
Motivation	Failure Avoidance	54 (22.7)	56 (23.9)	.77	.85
	Uncertain Control	48 (18.9)	49 (19.3)	.68	.78
Maladaptive	Self-Sabotage	40 (18.1)	41 (19.3)	.74	.79
Engagement	Disengagement	39 (16.6)	36 (15.8)	.64	.70

Note. Average scores from the current sample were transformed from scores out of 5 to converted scores out of 100 (as presented in the user manual).

Table 3

Descriptive Statistics for Subscales of MES, EvsD, and PALS

Factor	Measure	Sub-Factor	<i>M</i>	<i>SD</i>	Skew	Kurtosis	Cronbach's α	
Adaptive Motivation	MES	Self-Belief	4.28	0.80	-1.29	1.45	.83	
		Learning Focus	4.21	0.80	-1.28	1.62	.82	
		Valuing	4.20	0.83	-1.31	1.47	.79	
		<i>Scale Average</i>	4.23	0.73	-1.27	1.44	.91	
	S. EvsD	Emotional Engagement	3.05	0.74	-0.89	0.33	.80	
	T. EvsD	Emotional Engagement	3.18	0.78	-0.76	-0.15	.95	
	PALS	Academic Efficacy	4.05	0.87	-1.09	0.89	.79	
		Mastery Goal Oriented	4.30	0.82	-1.47	2.02	.81	
		<i>Scale Average</i>	3.67	0.68	-0.55	0.88	.86	
Adaptive Engagement	MES	Persistence	3.97	0.80	-0.68	0.08	.74	
		Planning	3.64	0.97	-0.45	-0.51	.79	
		Task Management	3.95	0.98	-0.87	0.03	.82	
		<i>Scale Average</i>	3.85	0.78	-0.57	-0.20	.89	
	S. EvsD	Behavioral Engagement	3.41	0.56	-0.94	0.48	.80	
	T. EvsD	Behavioral Engagement	2.90	0.93	-0.45	-0.89	.95	
	PALS	Academic Pressure	4.01	0.77	-0.86	0.75	.71	
	Maladaptive Motivation	MES	Anxiety	2.98	1.04	-0.08	-0.69	.73
			Failure Avoidance	2.69	1.13	0.39	-0.71	.77
			Uncertain Control	2.40	0.94	0.38	-0.32	.68
<i>Scale Average</i>			2.69	0.81	0.13	-0.14	.82	
S. EvsD		Emotional Disaffection	2.17	0.61	0.19	-0.33	.83	
T. EvsD		Emotional Disaffection	1.73	0.70	0.79	-0.03	.93	
PALS		Performance Avoid	2.56	0.98	0.25	-0.55	.49	
		Avoid Novelty	2.47	0.94	0.33	-0.33	.70	
		Low Achievement	2.11	0.77	0.51	-0.40	.63	
		Skepticism	1.86	0.89	1.17	1.05	.76	
	Performance Approach	2.66	1.07	0.42	-0.61	.77		
	<i>Scale Average</i>	2.25	0.62	0.61	0.46	.83		
Maladaptive Engagement	MES	Self-Sabotage	2.02	1.17	0.84	-0.38	.74	
		Disengagement	1.76	1.07	1.45	1.37	.64	
		<i>Scale Average</i>	1.98	0.75	0.74	0.54	.78	
	S. EvsD	Behavioral Disaffection	2.10	0.66	0.11	-0.63	.67	
	T. EvsD	Behavioral Disaffection	2.12	0.90	0.27	-1.04	.93	
	PALS	Self-Handicapping	2.18	0.95	0.58	-0.60	.77	
		Cheating Behavior	1.57	0.84	1.77	3.16	.79	
		Disruptive Behavior	2.42	1.08	0.46	-0.66	.83	
		<i>Scale Average</i>	2.06	0.73	0.72	0.12	.84	

Note. (S. EvsD) refers to student's self-ratings; (T. EvsD) refers to teacher's ratings of students.

Table 4

Descriptive Statistics for MES Items

Factor	Sub-Factor	Item	Missing	<i>M</i>	<i>SD</i>	Skew	Kurtosis	Frequencies				
								Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Adaptive Motivation	Self-Belief	13	2	4.43	0.91	-1.81	3.09	1.9%	3.0%	8.7%	22.7%	63.6%
		23	5	4.23	1.04	-1.40	1.44	3.4%	3.4%	14.2%	24.1%	54.8%
		33	4	4.19	1.01	-1.37	1.49	3.1%	4.6%	11.5%	32.1%	48.9%
		40	4	4.29	0.98	-1.39	1.40	1.9%	4.2%	13.0%	24.8%	56.1%
	Learning Focus	2	1	4.23	0.94	-1.30	1.51	1.9%	3.8%	12.5%	33.6%	48.3%
		7	1	4.32	1.01	-1.71	2.63	3.8%	2.6%	9.4%	26.4%	57.7%
		25	3	4.18	0.97	-1.31	1.72	3.0%	1.9%	15.2%	33.8%	46.0%
	Valuing	26	4	4.10	1.07	-1.15	0.72	3.4%	5.0%	16.4%	28.3%	46.9%
		4	2	3.88	1.10	-0.82	-0.03	3.8%	8.3%	19.7%	33.0%	35.2%
		14	2	4.48	0.94	-2.00	3.49	1.9%	4.5%	6.1%	18.6%	68.9%
34		2	4.18	1.14	-1.45	1.37	6.1%	2.7%	13.3%	23.5%	54.5%	
Adaptive Engagement	Persistence	41	3	4.31	1.02	-1.60	2.07	3.4%	3.0%	11.8%	22.8%	58.9%
		1	1	4.04	0.99	-1.17	1.31	3.4%	3.8%	15.1%	41.1%	36.6%
		9	1	3.99	1.14	-1.08	0.44	5.3%	5.7%	16.6%	29.8%	42.6%
		28	4	3.93	1.04	-0.82	0.07	2.7%	7.3%	20.2%	34.0%	35.9%
	Planning	36	6	3.93	1.09	-0.73	-0.38	2.3%	9.6%	20.8%	27.7%	39.6%
		21	0	3.56	1.28	-0.54	-0.78	9.0%	13.2%	20.3%	28.2%	29.3%
		27	2	3.95	1.13	-1.10	0.60	5.7%	5.7%	14.8%	36.0%	37.9%
	Task Management	30	3	3.69	1.28	-0.62	-0.71	7.6%	11.4%	21.7%	22.8%	36.5%
		39	4	3.35	1.29	-0.29	-0.95	10.7%	15.3%	26.7%	23.3%	24.0%
		3	2	4.00	1.20	-1.08	0.23	6.1%	6.4%	15.9%	25.0%	46.6%
17		2	3.86	1.19	-0.85	-0.17	5.7%	8.3%	19.3%	28.0%	38.6%	
Maladaptive Motivation	Anxiety	32	3	3.91	1.21	-0.98	0.03	6.5%	7.2%	16.7%	27.8%	41.8%
		44	4	4.05	1.21	-1.19	0.48	6.9%	4.6%	15.6%	22.9%	50.0%
		10	1	2.99	1.35	0.01	-1.18	17.4%	21.5%	23%	20.8%	17.4%
		19	1	3.2	1.45	-0.23	-1.29	18.9%	14.3%	19.6%	21.9%	25.3%

Continued

Factor	Sub-Factor	Item	Missing	<i>M</i>	<i>SD</i>	Skew	Kurtosis	Frequencies					
								Strongly Disagree	Disagree	Neither	Agree	Strongly Agree	
Maladaptive Motivation	Anxiety	37	7	2.91	1.36	0.00	-1.17	22.0%	15.8%	26.6%	20.1%	15.4%	
		43	4	2.78	1.44	0.20	-1.27	27.1%	17.9%	22.5%	14.5%	17.9%	
	Failure Avoidance	11	4	2.48	1.52	0.55	-1.17	39.3%	18.3%	15.3%	9.2%	17.9%	
		20	1	2.55	1.47	0.43	-1.22	35.5%	18.5%	17.4%	13.2%	15.5%	
	Uncertain Control	31	1	3.21	1.47	-0.21	-1.32	19.6%	13.2%	21.9%	17.4%	27.9%	
		38	2	2.51	1.40	0.50	-1.01	33.3%	20.8%	21.6%	10.2%	14.0%	
		6	2	2.63	1.33	0.31	-1.03	26.9%	21.6%	25.0%	15.2%	11.4%	
		12	1	2.66	1.36	0.29	-1.11	27.2%	20.8%	23.8%	15.5%	12.8%	
	Maladaptive Engagement	Self-Sabotage	16	1	2.40	1.34	0.49	-0.96	37.0%	17.4%	23.8%	12.8%	9.1%
			18	6	1.91	1.19	1.13	0.10	52.7%	22.3%	10.0%	11.2%	3.8%
5			1	2.02	1.17	0.84	-0.38	47.5%	19.2%	20.4%	9.4%	3.4%	
24			2	1.94	1.20	1.09	0.14	52.3%	19.3%	15.9%	7.6%	4.9%	
Disengagement		35	3	1.97	1.19	1.11	0.24	47.9%	25.9%	12.5%	8.4%	5.3%	
		42	2	2.06	1.21	0.89	-0.30	45.5%	22.7%	16.7%	10.2%	4.9%	
		8	0	1.76	1.07	1.45	1.37	56.0%	24.4%	10.5%	5.6%	3.4%	
		15	3	1.92	1.19	1.13	0.31	52.5%	19.0%	17.5%	5.7%	5.3%	
22	0	2.11	1.24	0.95	-0.06	42.5%	24.8%	19.2%	6.0%	7.5%			
29	2	1.98	1.22	1.11	0.25	49.6%	22.0%	15.9%	6.1%	6.4%			

Table 5

Descriptive Statistics for Student EvsD Items

Factor	Item	Missing	M	SD	Skew	Kurtosis	Frequencies			
							Not at all True	Not Very True	Sort of True	Very True
Emotional	2	0	3.00	0.92	-0.74	-0.20	9.5%	13.7%	44.1%	32.7%
Engagement	9	4	3.02	0.89	-0.67	-0.26	7.3%	16.6%	42.9%	33.2%
	13	1	2.99	0.98	-0.79	-0.34	12.6%	10.7%	41.6%	35.1%
	22	2	3.21	0.95	-1.05	0.12	8.8%	10.3%	32.2%	48.7%
	24	2	3.34	0.81	-1.09	0.58	3.4%	10.7%	34.5%	51.3%
Behavioral Engagement	1	0	3.66	0.621	-2.13	5.16	1.9%	2.3%	23.6%	72.2%
	8	1	3.57	0.64	-1.37	1.50	0.8%	5.7%	29.4%	64.1%
	15	2	3.25	0.86	-1.09	0.59	6.1%	9.2%	38.3%	46.4%
	18	2	3.36	0.80	-1.27	1.27	4.6%	6.9%	36.8%	51.7%
	23	1	3.19	0.84	-0.81	-0.01	4.2%	14.5%	38.9%	42.4%
Emotional Disaffection	4	1	1.66	0.88	1.02	-0.12	57.3%	22.5%	16.8%	3.4%
	5	2	2.46	1.04	-0.10	-1.18	24.5%	21.8%	36.8%	16.9%
	6	1	2.79	1.06	-0.41	-1.06	16.4%	19.5%	32.4%	31.7%
	7	0	2.41	1.07	0.03	-1.27	26.6%	24.0%	30.8%	18.6%
	11	1	2.06	1.04	0.48	-1.04	40.1%	25.2%	23.7%	11.1%
	12	1	1.87	1.01	0.78	-0.69	49.6%	22.5%	19.1%	8.8%
	16	1	2.18	1.08	0.34	-1.20	35.9%	24.8%	24.8%	14.5%
	17	1	1.87	1.02	0.86	-0.52	49.2%	25.2%	15.3%	10.3%
	19	2	2.62	1.11	-0.16	-1.30	21.5%	23.0%	28.0%	27.6%
	20	1	2.25	1.11	0.30	-1.28	34.0%	25.2%	22.5%	18.3%
Behavioral Disaffection	26	1	2.23	1.06	0.24	-1.22	33.2%	24.4%	28.6%	13.7%
	27	0	1.68	0.97	1.22	0.26	60.1%	20.2%	11.8%	8.0%
	3	2	1.63	0.94	1.26	0.32	63.2%	16.9%	13.8%	6.1%
	10	0	1.47	0.81	1.68	1.95	69.2%	18.3%	8.7%	3.8%
	14	1	2.32	1.14	0.15	-1.41	34.0%	19.5%	26.7%	19.8%
	21	0	2.60	1.01	-0.30	-1.01	20.2%	19.0%	41.8%	19.0%
	25	1	2.47	1.10	-0.06	-1.32	26.7%	20.2%	32.1%	21.0%

Table 6
 Descriptive Statistics for PALS Items

Factor	Sub-Factor	Item	Missing	<i>M</i>	<i>SD</i>	Skew	Kurtosis	Frequencies				
								Not at all True	Somewhat True		Very True	
Adaptive	Academic	1	0	3.98	1.06	-0.96	0.45	3.9%	4.2%	21.2%	30.9%	39.8%
Motivation	Efficacy	11	4	3.57	1.31	-0.50	-0.88	9.4%	12.2%	23.9%	21.2%	33.3%
		52	6	4.10	1.25	-1.21	0.31	6.7%	5.5%	16.2%	13.8%	57.7%
		56	4	4.42	1.00	-1.68	1.86	1.6%	6.7%	8.6%	14.9%	68.2%
		58	6	4.27	1.17	-1.57	1.41	5.5%	4.7%	10.7%	15.0%	64.0%
	Mastery Goal Orientation	9	2	4.33	1.04	-1.39	0.94	1.9%	5.4%	15.2%	12.8%	64.6%
		25	2	4.39	1.11	-1.72	1.89	3.9%	4.7%	11.7%	8.6%	71.2%
		29	4	4.30	1.11	-1.48	1.19	3.5%	5.1%	14.1%	12.2%	65.1%
		38	3	4.00	1.24	-1.00	-0.07	6.3%	6.6%	19.1%	17.2%	50.8%
		49	4	4.47	1.01	-2.02	3.42	3.5%	2.0%	11.0%	10.6%	72.9%
Adaptive Engagement	Academic	6	0	3.83	1.35	-0.87	-0.47	10.0%	6.9%	18.9%	17.8%	46.3%
		10	3	4.02	1.19	-0.99	0.02	5.1%	5.9%	21.1%	18.0%	50.0%
	Pressure	15	1	4.21	1.16	-1.34	0.80	4.7%	4.7%	16.3%	13.6%	60.9%
		17	2	3.98	1.32	-1.05	-0.13	8.6%	7.0%	15.2%	16.7%	52.5%
		19	2	3.98	1.22	-0.97	-0.06	5.8%	6.2%	20.6%	18.3%	49.0%
		53	5	4.04	1.19	-1.03	0.08	5.1%	5.9%	20.1%	18.1%	50.8%
57	5	4.07	1.24	-1.14	0.11	5.9%	7.9%	14.6%	16.1%	55.5%		
Maladaptive Motivation	Performance Avoid Goal	3	1	3.04	1.64	0.01	-1.60	28.7%	12.8%	18.2%	6.6%	33.7%
		33	3	2.08	1.41	1.02	-0.35	53.5%	14.8%	13.7%	6.3%	11.7%
		51	3	2.73	1.59	0.28	-1.45	35.5%	12.1%	20.3%	7.8%	24.2%
	Performance Approach	55	4	2.38	1.50	0.70	-0.95	42.4%	18.0%	16.9%	5.1%	17.6%
		8	1	2.97	1.41	0.06	-1.20	21.3%	15.9%	29.1%	12.4%	21.3%
		26	3	3.19	1.48	-0.17	-1.35	19.5%	14.5%	21.9%	15.6%	28.5%
		41	2	2.38	1.46	0.66	-0.93	41.2%	17.1%	19.5%	7.0%	15.2%
		45	2	2.4	1.49	0.56	-1.12	40.9%	15.6%	18.3%	8.9%	16.3%
		48	5	2.37	1.54	0.66	-1.10	45.7%	14.6%	14.2%	8.3%	17.3%
		7	0	2.54	1.40	0.46	-1.01	32.4%	19.3%	24.3%	9.7%	14.3%
Avoid Novelty	20	4	2.12	1.33	1.00	-0.18	45.9%	22.7%	15.3%	5.9%	10.2%	

Continued

Factor	Sub-Factor	Item	Missing	<i>M</i>	<i>SD</i>	Skew	Kurtosis	Frequencies				
								Not at all True	Somewhat True	Very True		
Maladaptive Motivation	Avoid	23	2	2.62	1.42	0.38	-1.07	31.1%	16.7%	27.6%	8.2%	16.3%
		35	4	2.63	1.35	0.35	-0.98	28.7%	18.4%	29.4%	10.2%	13.7%
	Self Presentation	40	3	2.50	1.42	0.48	-1.05	35.2%	17.6%	23.0%	10.2%	14.1%
		2	0	1.84	1.27	1.33	0.50	61.5%	13.5%	11.2%	6.9%	6.9%
		5	2	2.15	1.46	0.87	-0.74	54.5%	9.7%	14.8%	8.6%	12.5%
	Low Achievement	21	4	1.90	1.37	1.33	0.37	61.6%	12.5%	11.4%	3.1%	11.4%
			24	2	2.76	1.57	0.23	-1.46	33.9%	13.2%	18.7%	11.3%
		27	2	2.13	1.40	0.93	-0.48	51.0%	14.0%	17.5%	5.8%	11.7%
		37	4	1.97	1.27	1.12	0.11	53.7%	16.5%	16.5%	5.9%	7.5%
		46	4	2.04	1.33	1.01	-0.24	52.9%	14.5%	16.9%	6.7%	9%
	Skepticism Relevance	4	1	1.81	1.26	1.44	0.83	62.4%	14.3%	10.5%	5.0%	7.8%
			13	1	1.78	1.22	1.48	1.09	63.2%	13.2%	13.2%	3.5%
		28	2	1.86	1.29	1.33	0.55	61.1%	12.5%	14.0%	3.9%	8.6%
		32	3	1.94	1.32	1.23	0.27	57.8%	13.3%	16.0%	3.1%	9.8%
		36	2	1.91	1.34	1.32	0.41	59.1%	16.0%	10.1%	4.7%	10.1%
Maladaptive Engagement	Academic Self Handicap	43	2	1.74	1.20	1.56	1.35	65.0%	12.8%	12.1%	3.5%	6.6%
		12	1	2.22	1.44	0.76	-0.83	50.0%	10.5%	19.0%	8.5%	12.0%
		16	1	2.34	1.44	0.67	-0.91	42.6%	15.9%	19.8%	7.8%	14.0%
		18	1	2.34	1.51	0.66	-1.05	47.3%	10.9%	18.2%	7.8%	15.9%
		42	2	2.21	1.48	0.85	-0.74	50.2%	13.6%	15.6%	5.8%	14.8%
	Cheating Behavior	44	3	1.95	1.29	1.19	0.26	55.9%	14.8%	16.8%	3.9%	8.6%
		47	3	2.04	1.33	1.09	0.01	51.2%	18.0%	16.8%	3.5%	10.5%
		22	2	1.39	0.85	2.50	6.11	78.2%	10.9%	7.0%	1.9%	1.9%
		31	4	1.61	1.02	1.79	2.67	65.5%	17.3%	11.4%	2.4%	3.5%
		39	2	1.70	1.12	1.63	1.80	63.0%	17.1%	11.3%	3.5%	5.1%
Disruptive Behavior	14	1	2.38	1.40	0.63	-0.84	38.4%	18.6%	22.5%	7.4%	13.2%	
		30	4	2.77	1.48	0.25	-1.28	28.6%	16.9%	23.9%	10.2%	20.4%
	34	2	2.44	1.42	0.57	-0.92	37.4%	16.7%	24.9%	6.2%	14.8%	
	50	4	2.41	1.30	0.54	-0.73	34.1%	19.2%	28.6%	7.8%	10.2%	
	54	5	2.14	1.37	0.92	-0.43	48.4%	17.3%	16.9%	6.3%	11.0%	

Table 7

Descriptive Statistics for Teacher EvsD Items

Factor	Item	Missing	<i>M</i>	<i>SD</i>	Skew	Kurtosis	Frequencies			
							Not at all True	Not Very True	Sort of True	Very True
Emotional	6	0	3.12	0.86	-0.65	-0.41	4.3	18.7	37.4	39.6
Engagement	7	0	3.29	0.78	-0.90	0.30	2.7	11.8	39.6	46.0
	8	0	3.19	0.83	-0.83	0.07	4.3	13.9	40.1	41.7
	9	0	3.12	0.91	-0.81	-0.19	7.0	15.0	36.9	41.2
	10	0	3.15	0.89	-0.85	-0.04	6.4	13.9	38.0	41.7
Behavioral	1	0	3.00	1.01	-0.66	-0.70	11.2	17.1	32.1	39.6
Engagement	2	0	3.15	0.94	-0.86	-0.24	7.5	15.0	32.6	44.9
	3	0	3.00	1.00	-0.59	-0.82	9.6	20.9	29.4	40.1
	4	0	2.52	1.08	0.08	-1.27	19.8	33.7	20.9	25.7
	5	0	2.82	1.05	-0.36	-1.11	13.9	24.1	28.3	33.7
Emotional	16	1	2.01	0.98	0.51	-0.88	38.7	29.6	23.7	8.1
Disaffection	17	0	1.96	0.97	0.62	-0.73	41.2	29.9	20.9	8.0
	18	0	1.60	0.81	1.22	0.76	56.7	29.4	10.7	3.2
	19	0	1.63	0.86	1.21	0.53	58.3	25.1	12.3	4.3
	20	1	1.63	0.89	1.31	0.81	58.1	26.3	9.7	5.9
	21	0	1.51	0.75	1.48	1.73	62.0	27.8	7.5	2.7
	22	0	1.61	0.91	1.37	0.81	62.0	21.4	10.2	6.4
	23	0	1.79	0.95	0.97	-0.16	50.8	27.3	14.4	7.5
	24	0	1.76	0.95	1.02	-0.03	51.9	27.3	13.4	7.5
	25	0	1.82	1.02	0.95	-0.37	51.9	24.1	13.9	10.2
Behavioral	11	0	2.37	1.03	0.01	-1.19	26.7	24.1	34.8	14.4
Disaffection	12	0	1.93	0.98	0.66	-0.71	43.4	28.3	20.3	8.0
	13	0	1.94	1.01	0.66	-0.78	44.4	26.2	20.3	9.1
	14	5	2.25	1.09	0.23	-1.30	34.1	22.5	27.5	15.9
	15	0	2.12	1.03	0.42	-1.04	35.8	28.3	24.1	11.8

Table 8

Pearson's Correlation Coefficients for Subfactors of Adaptive Motivation

	1	2	3	4	5	6	7
1. Self-Belief	–	0.70*	0.73*	0.56*	0.61*	0.52*	0.16*
2. Valuing		–	0.69*	0.40*	0.65*	0.57*	0.15*
3. Learning Focus			–	0.46*	0.60*	0.59*	0.17*
4. Academic Efficacy				–	0.57*	0.38*	0.10
5. Mastery Goal Orientation					–	0.54*	0.11
6. Student Emotional Engagement						–	0.12
7. Teacher Emotional Engagement							–

Note. (*) indicate $p < 0.05$

Table 9

Pearson Correlation Coefficients for Subfactors of Adaptive Engagement

	1	2	3	4	5	6
1. Planning	–	0.63*	0.55*	0.31*	0.51*	0.11
2. Task Management		–	0.63*	0.27*	0.56*	0.12
3. Persistence			–	0.30*	0.61*	0.15*
4. Academic Pressure				–	0.35*	0.06
5. Student Behavioral Engagement					–	0.27*
6. Teacher Behavioral Engagement						–

Note. (*) indicate $p < 0.05$

Table 10

Pearson Correlation Coefficients for Subfactors of Maladaptive Motivation

	1	2	3	4	5	6	7	8	9	10
1. Anxiety	–	0.36*	0.40*	0.12	0.22*	0.18*	0.26*	0.04	0.48*	0.10
2. Failure Avoidance		–	0.46*	0.32*	0.42*	0.20*	0.40*	0.17*	0.39*	0.10
3. Uncertain Control			–	0.17*	0.25*	0.36*	0.48*	0.30*	0.43*	0.27*
4. Performance Approach				–	0.47*	0.10	0.21*	0.12	0.17*	0.06
5. Performance Avoid					–	0.22*	0.34*	0.18*	0.32*	0.08
6. Avoid Novelty						–	0.43*	0.35*	0.31*	0.16*
7. Self Presentation							–	0.41*	0.36*	0.12
8. Relevance Skeptic								–	0.29*	0.33*
9. Student Emotional Disaffection									–	0.25*
10. Teacher Emotional Disaffection										–

Note. (*) indicate $p < 0.05$

Table 11

Pearson's Correlation Coefficients for Subfactors of Maladaptive Engagement

	1	2	3	4	5	6	7
1. Self-Sabotage	–	0.52*	0.40*	0.31*	0.32*	0.45*	0.25*
2. Disengagement		–	0.35*	0.29*	0.36*	0.45*	0.19*
3. Self-Handicapping			–	0.29*	0.39*	0.28*	0.24*
4. Cheating Behavior				–	0.42*	0.36*	0.10
5. Disruptive Behavior					–	0.48*	0.50*
6. Student Behavioral Disaffection						–	0.31*
7. Teacher Behavioral Disaffection							–

Note. (*) indicate $p < 0.05$

Table 12

Standardized Item Factor Loadings and Errors for Model 4

Item	Factors								
	Self-Belief	Learning Focus	Valuing	Persistence	Planning	Task Management	Anxiety	Failure Avoid	Uncertain Control
13	0.80 (0.03)								
23	0.84 (0.03)								
33	0.81 (0.03)								
40	0.86 (0.02)								
2		0.75 (0.03)							
7		0.81 (0.03)							
25		0.84 (0.03)							
26		0.79 (0.03)							
4			0.69 (0.04)						
14			0.82 (0.04)						
34			0.73 (0.04)						
41			0.88 (0.03)						
1				0.59 (0.05)					
9				0.77 (0.03)					
28				0.69 (0.04)					
36				0.82 (0.03)					
21					0.70 (0.04)				
27					0.70 (0.04)				
30					0.84 (0.03)				
39					0.81 (0.03)				
3						0.65 (0.04)			
17						0.81 (0.03)			
32						0.88 (0.03)			
44						0.87 (0.03)			
10							0.70 (0.05)		
19							0.60 (0.05)		

Continued

Table 13

Model 4 First-Order Standardized Factor Loadings and Errors on Higher Order Factors

First-Order Factors	Higher-Order Factors			
	Adaptive Motivation	Adaptive Engagement	Maladaptive Motivation	Maladaptive Engagement
Self-Belief	0.97 (0.02)			
Learning Focus	0.92 (0.02)			
Valuing	0.93 (0.02)			
Persistence		0.96 (0.02)		
Planning		0.81 (0.03)		
Task Management		0.92 (0.02)		
Anxiety			0.47 (0.06)	
Failure Avoidance			0.57 (0.06)	
Uncertain Control			1.24 (0.08)	
Self-Sabotage				0.79 (0.04)
Disengagement				0.95 (0.04)

Table 14

Standardized Item Factor Loadings and Errors for Model 8

Item	Factors							
	Student Emotional Engage	Teacher Emotional Engage	Academic Efficacy	Mastery Goal Orientation	Student Behavioral Engage	Teacher Behavioral Engage	Academic Pressure	Student Emotional Disaffection
Student EvsD2	0.67 (0.05)							
Student EvsD9	0.65 (0.05)							
Student EvsD13	0.74 (0.04)							
Student EvsD22	0.91 (0.04)							
Student EvsD24	0.65 (0.07)							
Teacher EvsD6		0.89 (0.02)						
Teacher EvsD7		0.83 (0.03)						
Teacher EvsD8		0.98 (0.01)						
Teacher EvsD9		0.98 (0.01)						
Teacher EvsD10		0.99 (0.01)						
PALS1			0.69 (0.06)					
PALS11			0.50 (0.07)					
PALS52			0.77 (0.05)					
PALS56			0.85 (0.06)					
PALS58			0.82 (0.05)					
PALS9				0.68 (0.07)				
PALS25				0.87 (0.06)				
PALS29				0.67 (0.06)				
PALS38				0.65 (0.07)				
PALS49				0.90 (0.06)				
Student EvsD1					0.76 (0.05)			
Student EvsD8					0.75 (0.04)			
Student EvsD15					0.60 (0.06)			
Student EvsD18					0.92 (0.03)			
Student EvsD23					0.81 (0.04)			

Continued

Item	Factors								
	Student Behavioral Engage	Teacher Behavioral Engage	Academic Pressure	Student Emotional Disaffection	Teacher Emotional Disaffection	Performance Avoid	Avoid Novelty	Self Presentation	Relevance Skeptic
Teacher EvsD1		0.92 (0.02)							
Teacher EvsD2		0.95 (0.01)							
Teacher EvsD3		0.99 (0.01)							
Teacher EvsD4		0.92 (0.01)							
Teacher EvsD5		0.96 (0.01)							
PALS6			0.37 (0.09)						
PALS10			0.51 (0.09)						
PALS15			0.51 (0.10)						
PALS17			0.87 (0.09)						
PALS19			0.58 (0.10)						
PALS53			0.74 (0.08)						
PALS57			0.38 (0.10)						
Student EvsD4				0.58 (0.07)					
Student EvsD5				0.85 (0.04)					
Student EvsD6				0.33 (0.07)					
Student EvsD7				0.82 (0.04)					
Student EvsD11				0.79 (0.04)					
Student EvsD12				0.44 (0.06)					
Student EvsD16				0.27 (0.07)					
Student EvsD17				0.53 (0.07)					
Student EvsD19				0.53 (0.06)					
Student EvsD20				0.78 (0.05)					
Student EvsD26				0.40 (0.07)					
Student EvsD27				0.67 (0.07)					
Teacher EvsD16					0.96 (0.01)				
Teacher EvsD17					0.95 (0.01)				
Teacher EvsD18					0.69 (0.04)				

Continued

Item	Factors							
	Academic Pressure	Student Emotional Disaffection	Teacher Emotional Disaffection	Performance Avoid	Avoid Novelty	Self Presentation	Relevance Skeptic	Performance Approach
Teacher EvsD19			0.74 (0.04)					
Teacher EvsD20			0.91 (0.02)					
Teacher EvsD21			0.90 (0.02)					
Teacher EvsD22			0.83 (0.03)					
Teacher EvsD23			0.79 (0.03)					
Teacher EvsD24			1.00 (0.01)					
Teacher EvsD25			1.00 (0.01)					
PALS3				0.39 (0.13)				
PALS33				0.47 (0.13)				
PALS51				0.46 (0.11)				
PALS55				0.73 (0.11)				
PALS7					0.50 (0.08)			
PALS20					0.88 (0.08)			
PALS23					0.58 (0.07)			
PALS35					0.56 (0.08)			
PALS40					0.63 (0.07)			
PALS2						0.61 (0.10)		
PALS5						0.58 (0.09)		
PALS21						0.52 (0.10)		
PALS24						0.29 (0.10)		
PALS27						0.34 (0.10)		
PALS37						0.85 (0.09)		
PALS46						0.35 (0.09)		
PALS4							0.60 (0.08)	
PALS13							0.78 (0.08)	
PALS28							0.81 (0.06)	
PALS32							0.60 (0.07)	
PALS36							0.69 (0.06)	
PALS43							0.73 (0.07)	

Continued

Table 15

Model 8 First-Order Standardized Factor Loadings and Errors on Higher Order Factors

First-Order Factors	Higher-Order Factors			
	Adaptive Motivation	Adaptive Engagement	Maladaptive Motivation	Maladaptive Engagement
Student Emotional Engagement	0.58 (0.05)			
Teacher Emotional Engagement	0.88 (0.04)			
Academic Efficacy	0.50 (0.05)			
Mastery Goal Orientation	0.51 (0.05)			
Student Behavioral Engagement		0.57 (0.06)		
Teacher Behavioral Engagement		0.66 (0.06)		
Academic Pressure		0.24 (0.05)		
Student Emotional Disaffection			0.58 (0.04)	
Teacher Emotional Disaffection			0.77 (0.04)	
Performance Avoid			0.39 (0.07)	
Avoid Novelty			0.46 (0.05)	
Self Presentation			0.46 (0.06)	
Relevance Skeptic			0.54 (0.05)	
Performance Approach			0.21 (0.06)	
Student Behavioral Disaffection				0.73 (0.04)
Teacher Behavioral Disaffection				0.92 (0.02)
Self-Handicapping Behavior				0.46 (0.05)
Cheating Behavior				0.43 (0.06)
Disruptive Behaviors				0.68 (0.03)

Figures

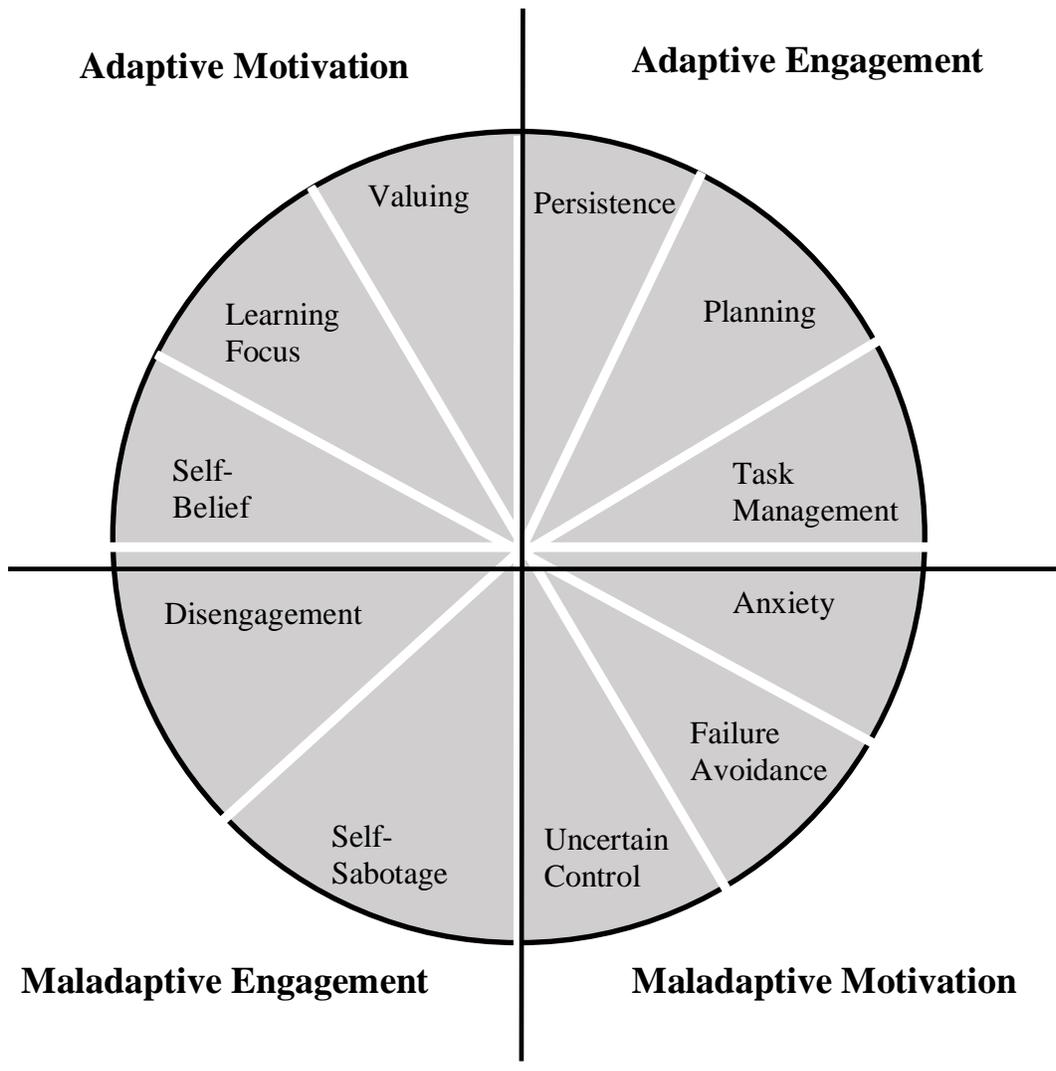


Figure 1. Motivation and Engagement Wheel (reproduced from Martin et al., 2007).

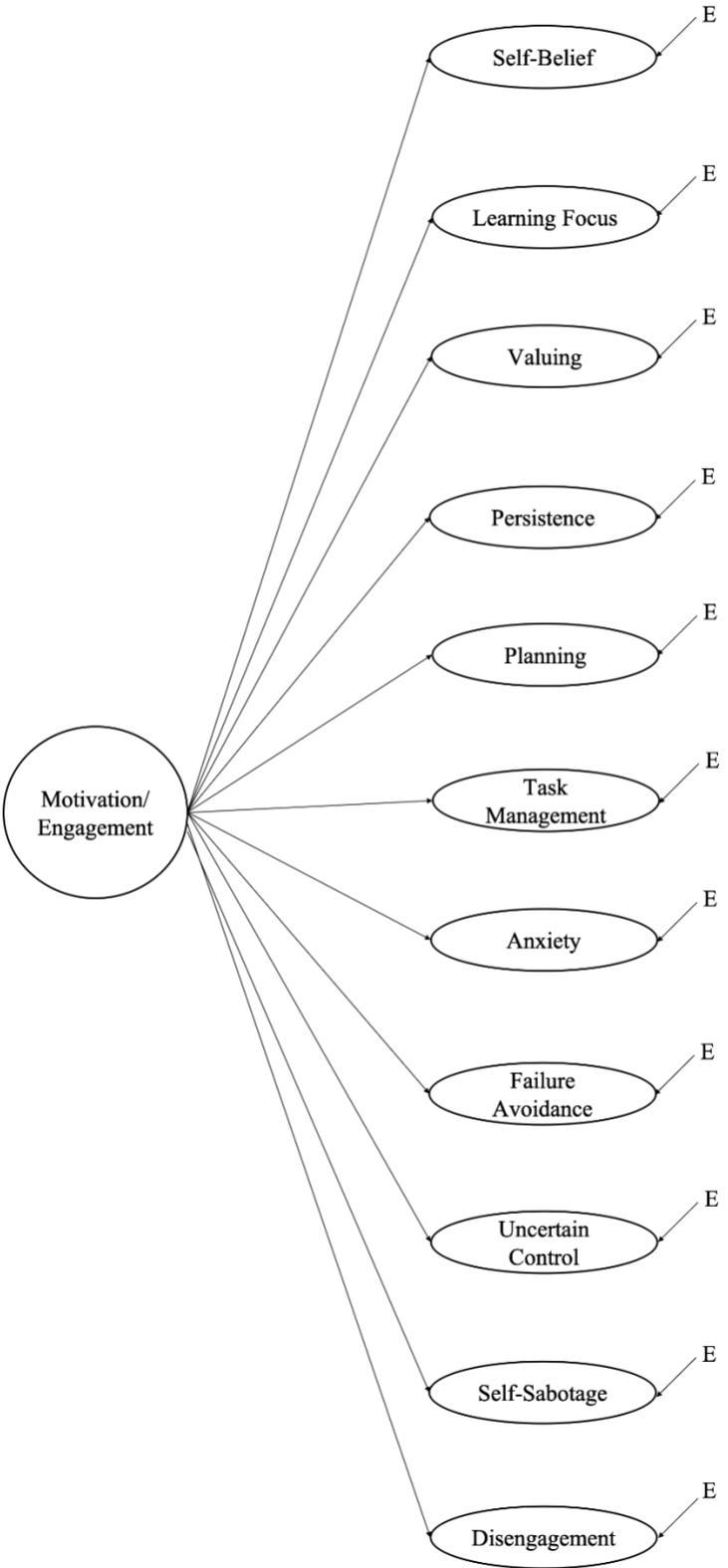


Figure 2. Higher-order single-factor replication model of motivation/engagement.

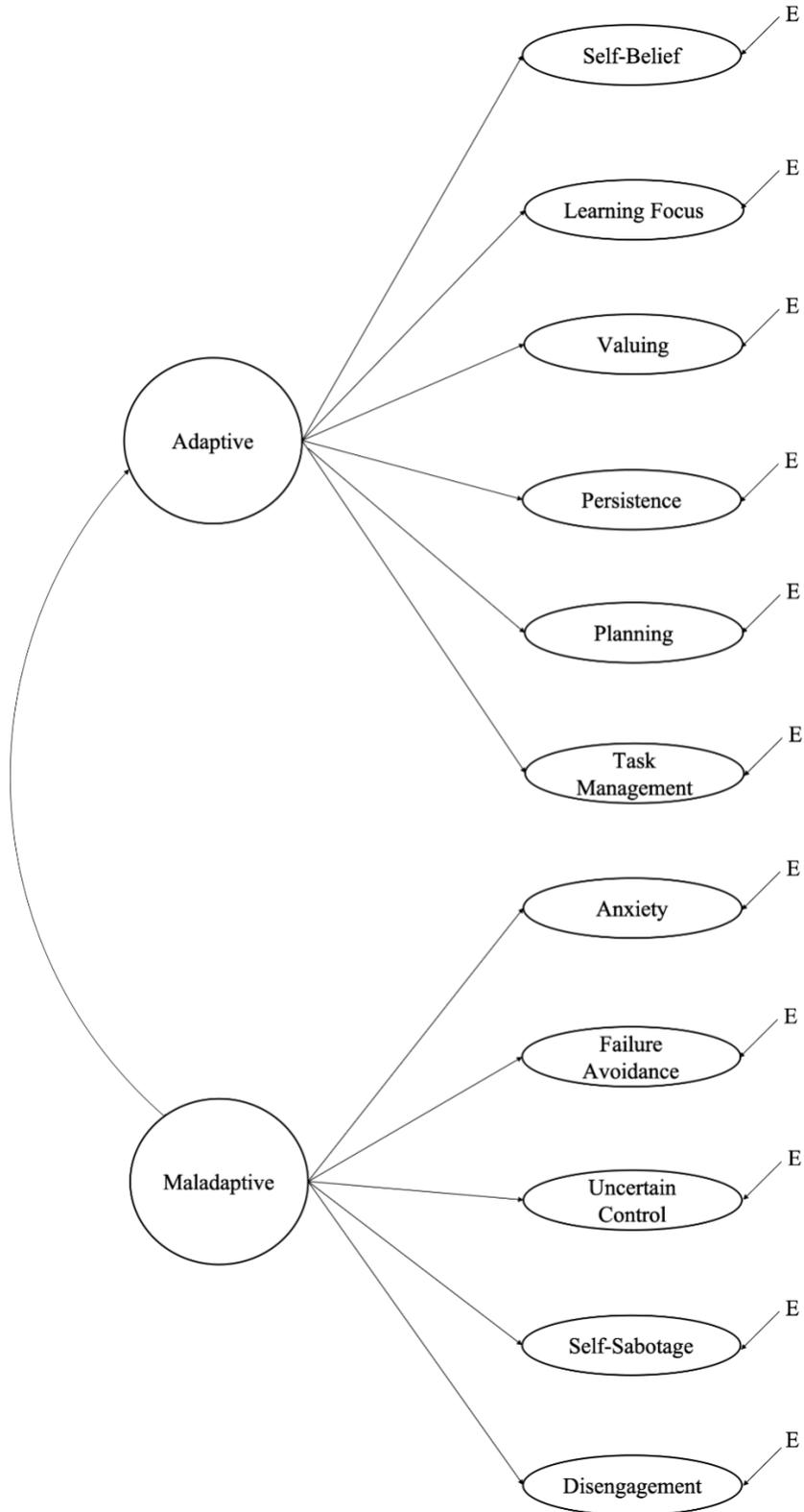


Figure 3. Higher-order two-factor replication model of adaptive and maladaptive traits.

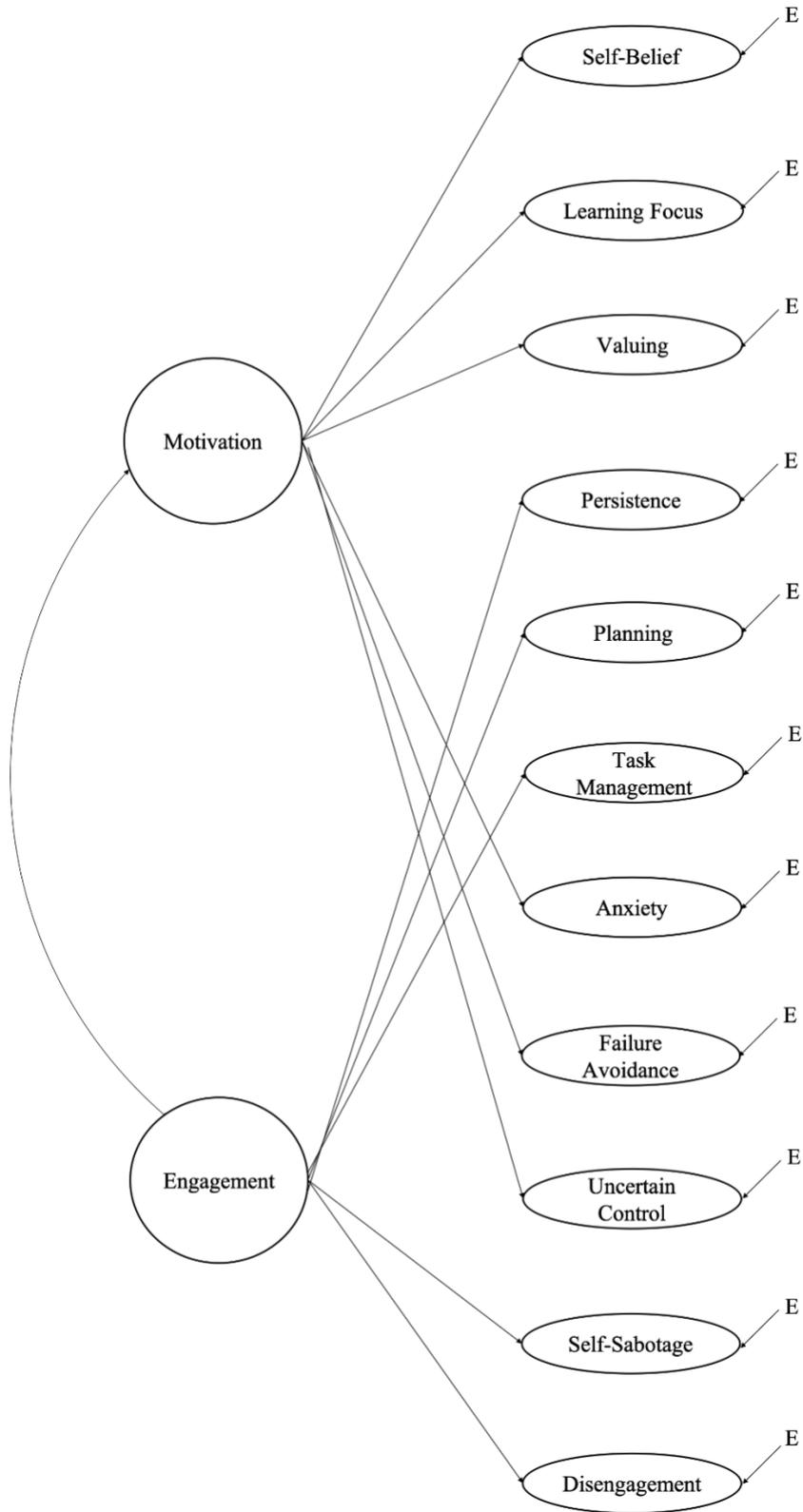


Figure 4. Higher-order two-factor replication model of motivation and engagement.

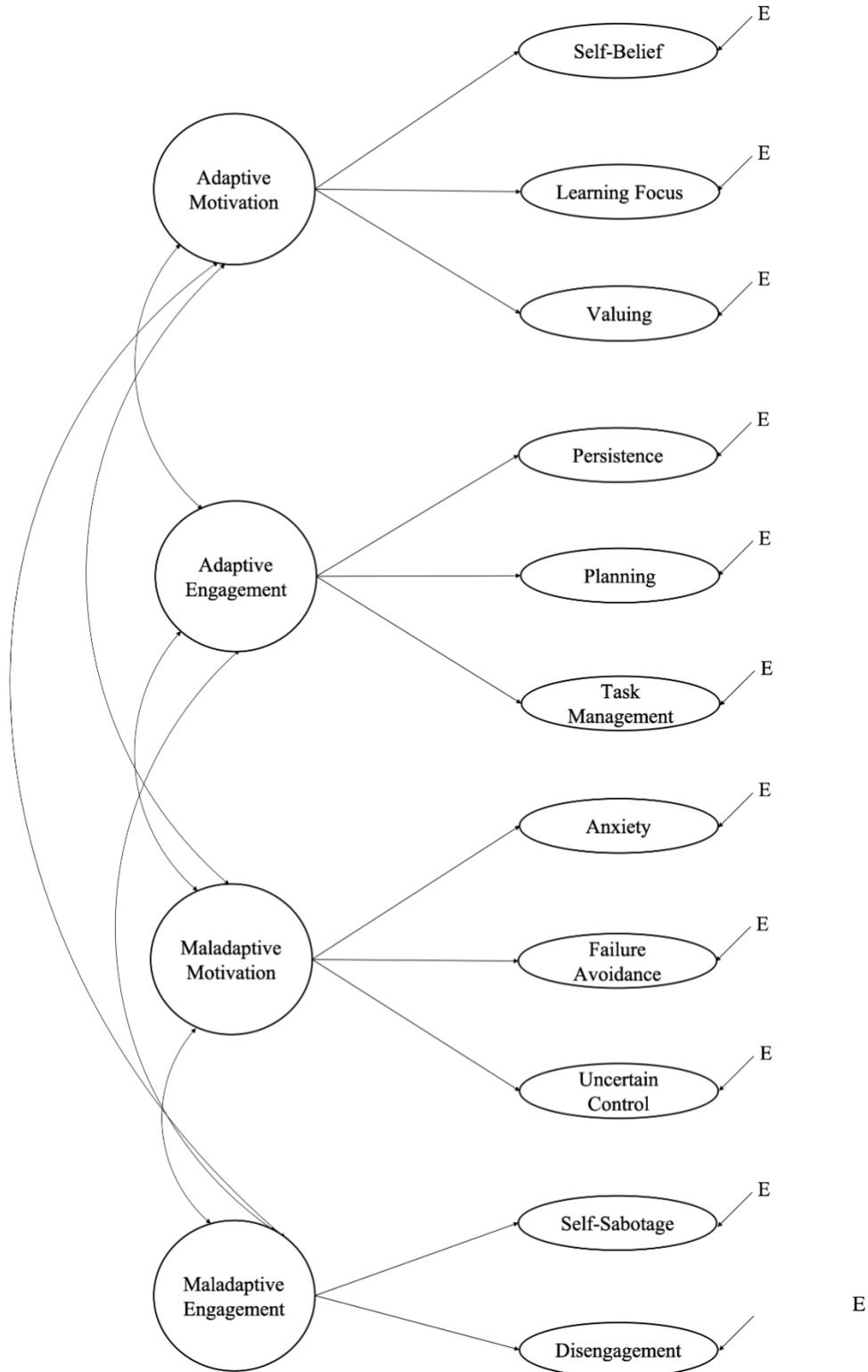


Figure 5. Higher-order four-factor model of adaptive and maladaptive motivation and engagement.

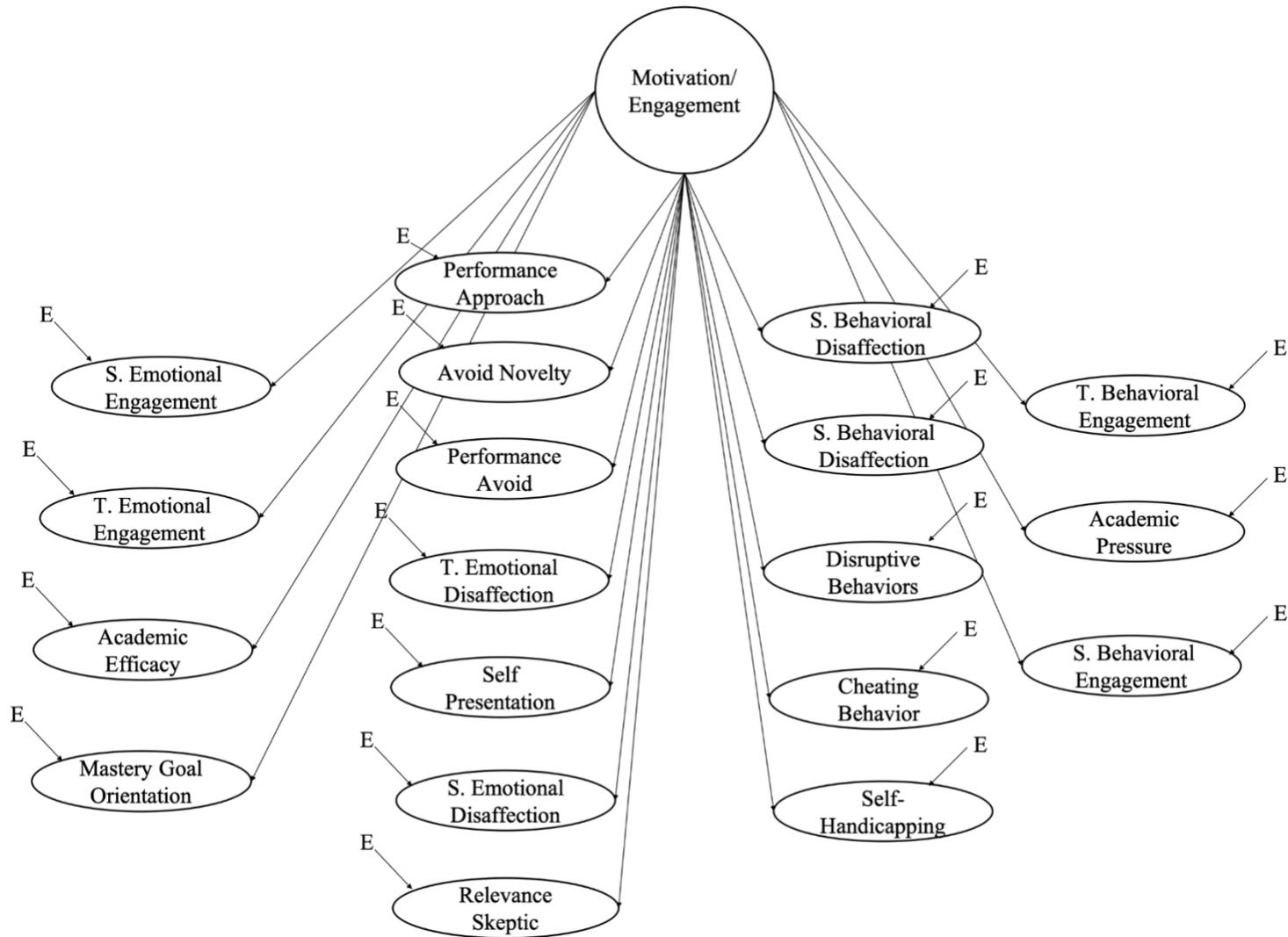


Figure 6. Higher-order single-factor model of motivation/engagement.

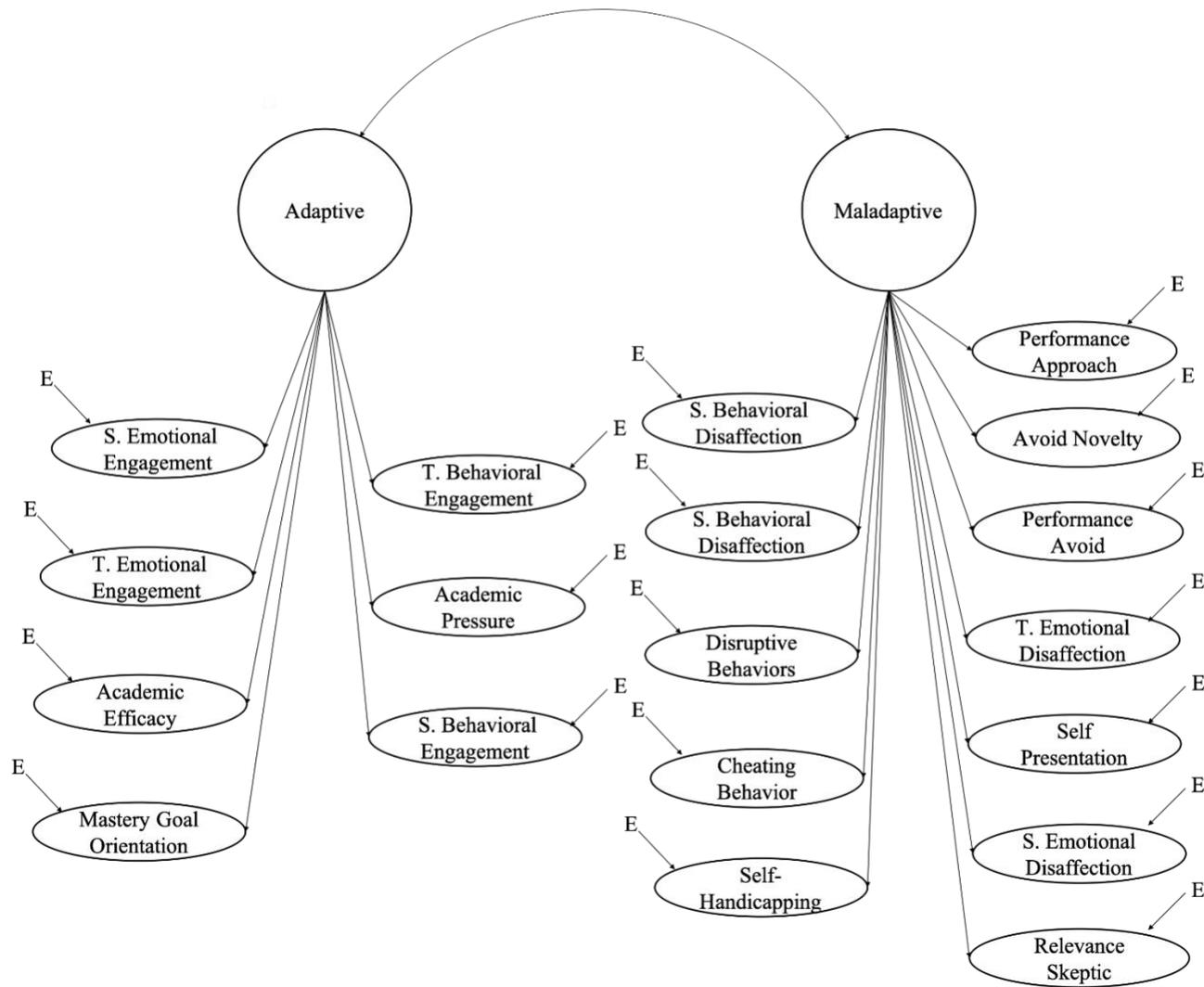


Figure 7. Higher-order two-factor model of adaptive and maladaptive traits.

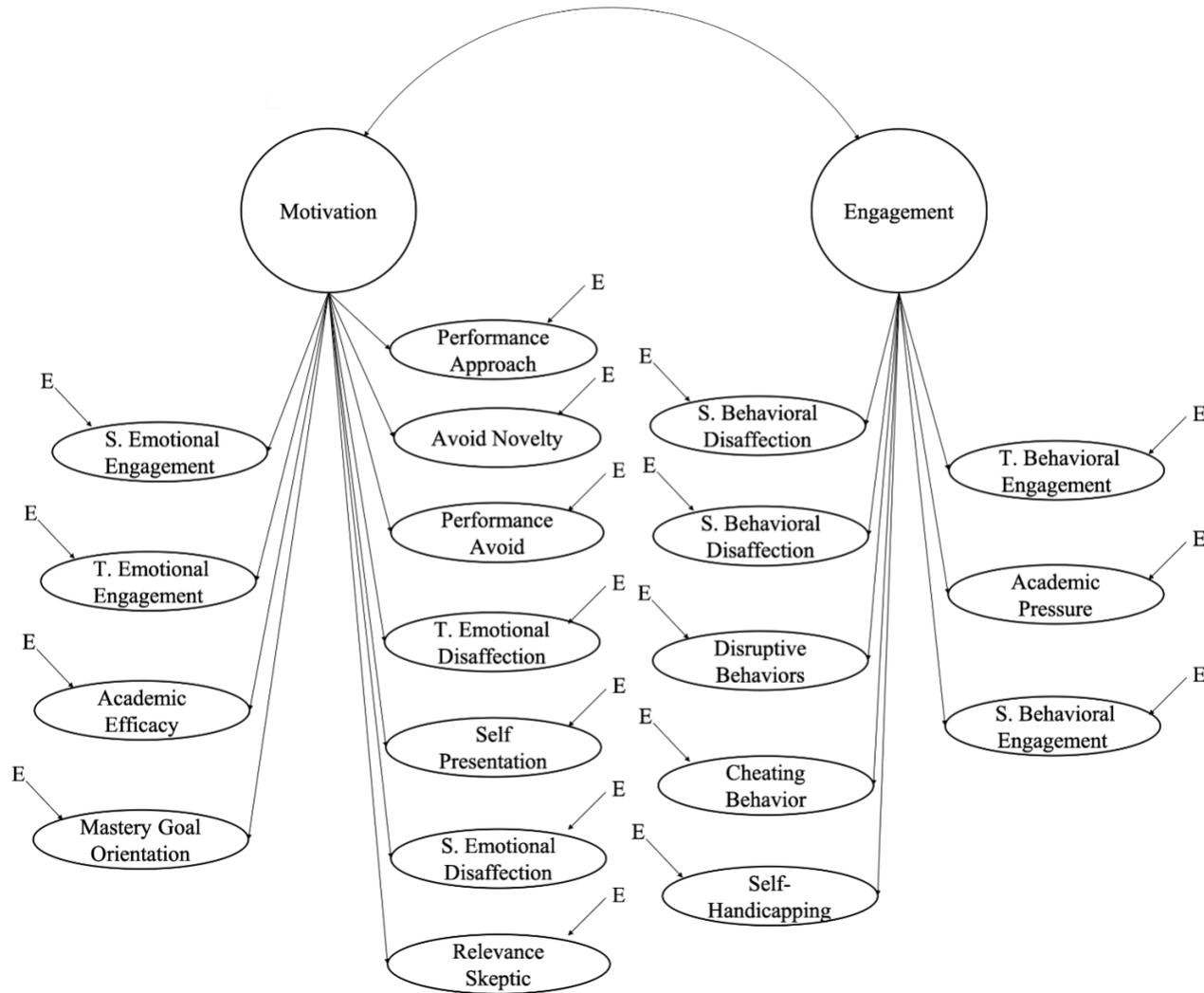


Figure 8. Higher-order two-factor model of motivation and engagement.

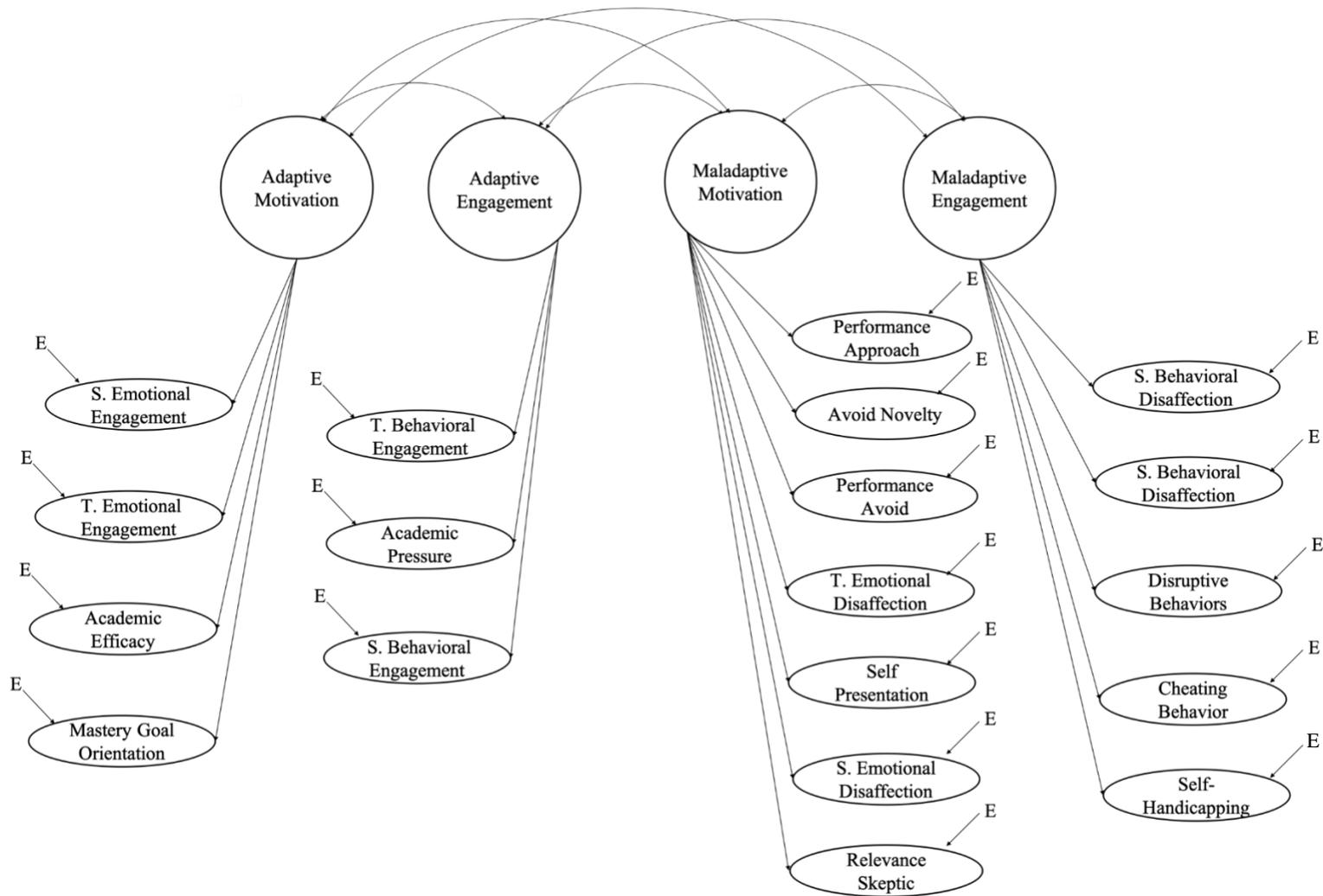


Figure 9. Higher-order four-factor model of adaptive and maladaptive motivation and engagement.

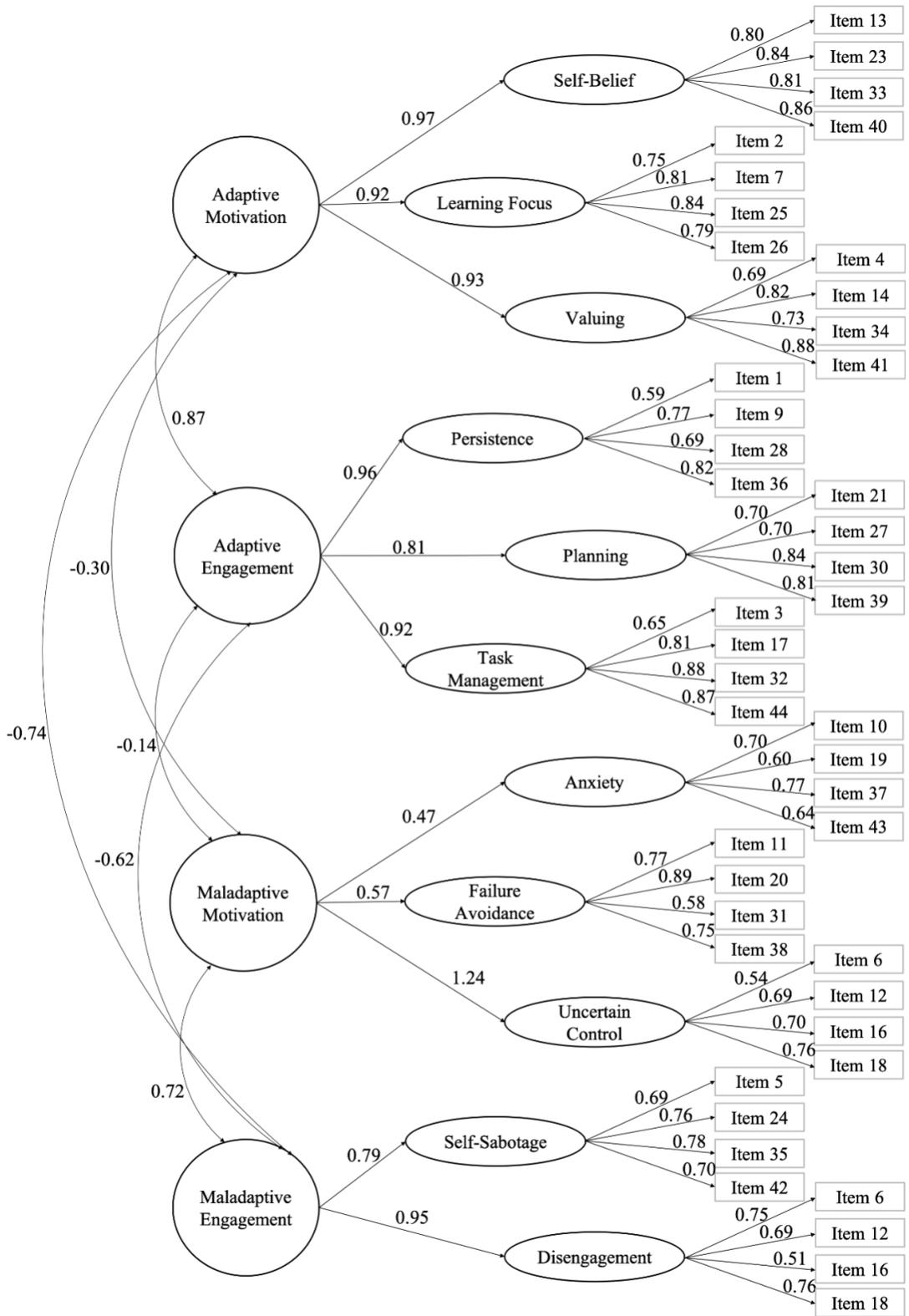


Figure 10. Four-factor replication model (Model 4) with standardized factor loadings

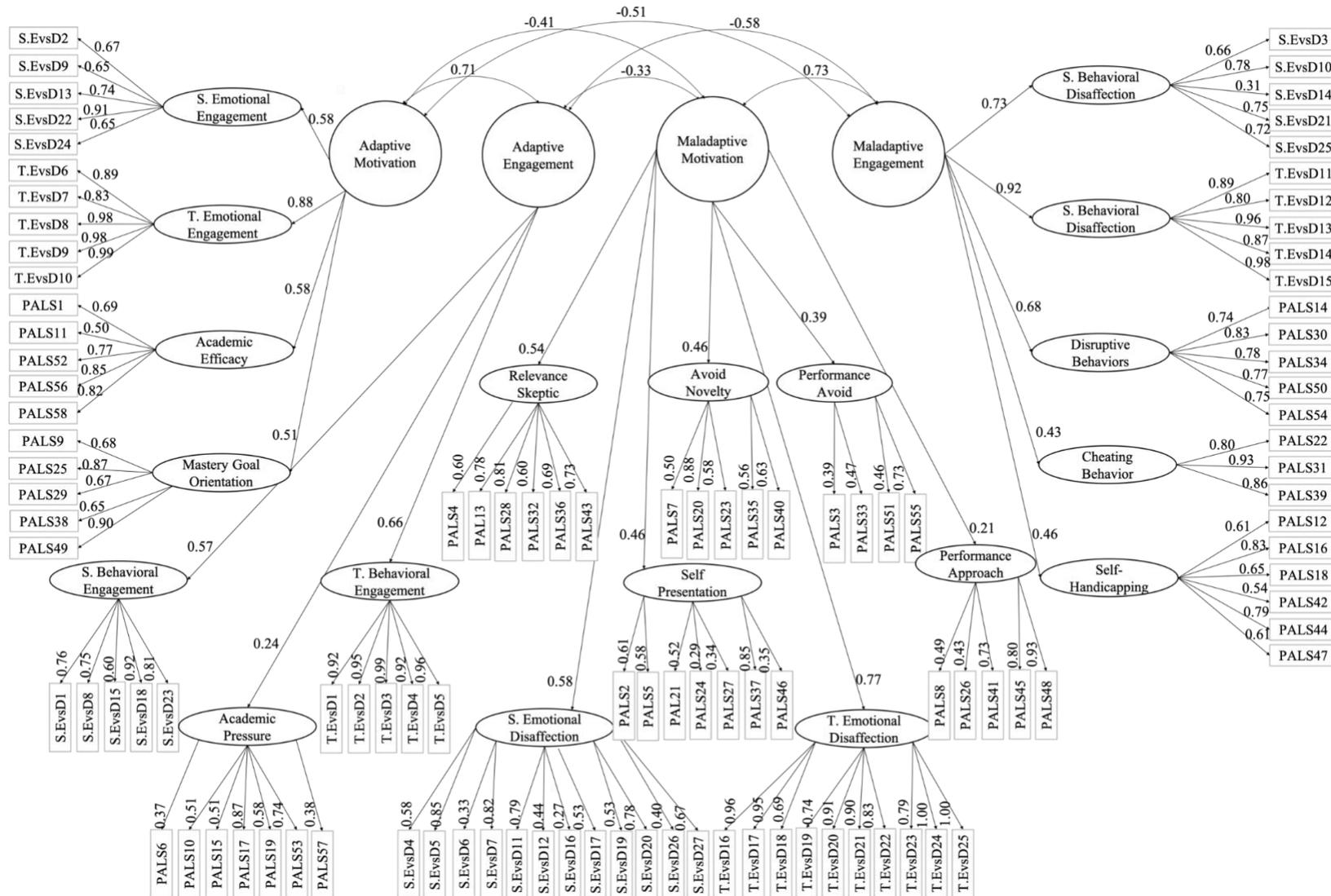


Figure 11. Four-factor adaptability model (Model 8) with standardized factor loadings

Appendices

Appendix A

Theoretical alignment for subscale categorization

Higher Order Factor	Sub Factor	Example Item	Theoretical Orientation
Adaptive Motivation	Self-Belief	If I try hard, I believe I can do my schoolwork well ^a	SCT
	Learning Focus	I feel very pleased with myself when I really understand what I am taught at school ^a	AGT; SDT
	Valuing	Learning at school is important to me ^a	SDT
	Emotional Engagement	When we work on something in class, I feel interested ^b	SDT
	Mastery Goal Orientation	One of my goals in class is to learn as much as I can ^c	AGT; SCT; SDT
	Academic Efficacy	Even if the work is hard, I can learn it ^c	SCT
Adaptive Engagement	Persistence	If I can't understand my schoolwork at first, I keep going over it until I understand it ^a	AGT; SCT
	Planning	Before I start an assignment I plan out how I am going to do it ^a	
	Task Management	When I study, I usually study in places where I can concentrate ^a	
	Behavioral Engagement	I try hard to do well in school ^b	Attribution Theory
	Academic Press	When I've figured out how to do a problem, my teacher gives me more challenging problems to think about ^c	AGT
Maladaptive Motivation	Anxiety	When exams and assignments are coming up, I worry a lot ^a	SCT
	Failure Avoidance	Often the main reason I work at school is because I don't want to disappoint my parents ^a	AGT; SDT
	Uncertain Control	I'm often unsure how I can avoid doing poorly at school ^a	SCT; Attribution Theory
	Emotional Disaffection	When we work on something in class, I feel bored ^b	SDT

	Performance-Avoid Goal Orientation	One of my goals in class is to avoid looking like I have trouble doing the work ^c	AGT; SCT;
	Avoiding Novelty	I would prefer to do class work that is familiar to me, rather than work I would have to learn how to do ^c	AGT; Attribution Theory
	Performance-Approach Goal Orientation	One of my goals is to show others that I'm good at my class work ^c	AGT; SCT; SDT
	Self-Presentation of Low Achievement	I would avoid participating in class if it meant that other students would think I know a lot ^c	AGT; SCT
	Skepticism About Relevance of School for Future Success	Doing well in school doesn't improve my chances of having a good life when I grow up ^c	Attribution Theory
Maladaptive Engagement	Self-Sabotage	I sometimes don't study very hard before exams so I have an excuse if I don't do as well as I hoped ^a	Attribution Theory
	Disengagement	I often feel like giving up at school ^a	SCT
	Behavioral Disaffection	When I'm in class, I just act like I'm working ^b	
	Academic Self-Handicapping Strategies	Some students fool around the night before a test. Then if they don't do well, they can say that is the reason. How true is this of you? ^c	Attribution Theory
	Cheating Behavior	I sometimes copy answers from other students during tests ^c	
	Disruptive Behavior	I sometimes annoy my teacher during class ^c	

Note. (a) indicates MES; (b) indicates EvsD; (c) PALS.

Appendix B

School-Based Professional Demographic Sheet

Please provide the following information about you:

Name: _____ School: _____

Grade: _____ # of Students in Class: _____

Gender: Male
 Female

Race: White
 Black or African-American
 American Indian or Alaska Native
 Asian
 Pacific Islander
 Other: _____

Ethnicity: Non-Hispanic Hispanic

Total years teaching: 1-5
 6-10
 11-15
 16-20
 20+

Years teaching this grade: 1-5
 6-10
 11-15
 16-20
 20+

Highest degree attained: Bachelor's
 Master's
 Master's Plus
 Doctorate
 Other: _____

Area(s) of certification: General Education
 Special Education
 Other: _____

Appendix C

Motivation and Engagement Scale – Junior School Items

1. If I can't understand my schoolwork, I keep trying until I do
2. I feel very happy with myself when I really understand what I'm taught at school
3. I usually do my homework in places where I can concentrate
4. I'm able to use some of the things I learn at school in other parts of my life
5. Sometimes I don't try hard at school so I can have a reason if I don't do well
6. When I don't do well at school I don't know how to avoid that happening next time
7. I feel very happy with myself when I do well at school by working hard
8. Each week I'm trying less and less at school
9. If my homework is difficult, I keep working at it trying to figure it out
10. When I have a project to do, I worry about it a lot
11. The main reason I try at school is because I don't want people to think that I'm dumb
12. When I get a good mark I often don't know how I'm going to get that mark again
13. If I try hard, I believe I can do my schoolwork well
14. Learning at school is important
15. I don't really care about school anymore
16. When I get a bad mark I don't know how to avoid that happening next time
17. When I do homework, I get organized so I can do it well
18. I don't know how to get good marks at school
19. I worry about getting bad marks in tests and projects
20. The main reason I try at school is because I don't want people to think bad things about me

21. I usually have a plan for how to do my homework when I start it
22. I'm not involved in things like class activities and class discussion at school
23. If I don't give up, I believe I can do schoolwork that is hard
24. I sometimes don't work very hard at school so I can have a reason if I don't do well
25. I feel very happy with myself when what I learn at school shows me how something works
26. I feel very happy with myself when I learn new things at school
27. Before I start a project, I plan out how I am going to do it
28. When I'm taught something that doesn't make sense, I spend time to try to understand it
29. I've given up being interested in school
30. I have a plan for how to do my homework or projects when I start them
31. The main reason I try at school is because I don't want to disappoint my parents
32. When I do homework, I try to find a place where I can do it well
33. If I have enough time, I believe I can do well in my schoolwork
34. What I learn at school will be useful in the future
35. I sometimes waste time the night before a test so I can have a reason if I don't do well
36. I'll keep working at difficult schoolwork until I've figured it out
37. When I do tests I don't feel very good
38. The main reason I try at school is because I don't want my teacher to think bad things about me
39. I usually stick to a homework plan
40. If I try hard enough, I believe I can do all my schoolwork

41. It's important to understand what I'm taught at school
42. I sometimes leave homework until the last moment so I can have a reason if I don't do so well
43. I worry about school and schoolwork
44. When I do homework, I usually do it where I can concentrate best

Appendix D

Engagement Versus Disaffection with Learning: Student Report Items

Behavioral Engagement

1. I try hard to do well in school.
2. In class, I work as hard as I can.
3. When I'm in class, I participate in class discussions.
4. I pay attention in class.
5. When I'm in class, I listen very carefully.

Emotional Engagement

1. When I'm in class, I feel good.
2. When we work on something in class, I feel interested.
3. Class is fun.
4. I enjoy learning new things in class.
5. When we work on something in class, I get involved.

Behavioral Disaffection

1. When I'm in class, I just act like I'm working. (–)
2. I don't try very hard at school. (–)
3. In class, I do just enough to get by. (–)
4. When I'm in class, I think about other things. (–)
5. When I'm in class, my mind wanders. (–)

Emotional Disaffection

1. a. When we work on something in class, I feel bored. (–)
b. When I'm doing work in class, I feel bored. (–)

- c. When my teacher first explains new material, I feel bored. (–)
2. a. When I'm in class, I feel worried. (–)
- b. When we start something new in class, I feel nervous. (–)
 - c. When I get stuck on a problem, I feel worried. (–)
3. When we work on something in class, I feel discouraged. (–)
4. Class is not all that fun for me. (–)
5. a. When I'm in class, I feel bad. (–)
- b. When I'm working on my classwork, I feel mad. (–)
 - c. When I get stuck on a problem, it really bothers me. (–)
 - d. When I can't answer a question, I feel frustrated. (–)

Note. Adapted from Wellborn (1991). The items added to the Emotional Disaffection subscale can be used to tap the more differentiated disaffected emotions.

Appendix E

Engagement Versus Disaffection with Learning: Teacher Report Items

Behavioral Engagement

1. In my class, this student works as hard as he/she can.
2. When working on classwork in my class, this student appears involved.
3. When I explain new material, this student listens carefully.
4. In my class, this student does more than required.
5. When this student doesn't do well, he/she works harder.

Emotional Engagement

1. In my class, this student is enthusiastic.
2. In class, this student appears happy.
3. When we start something new in class, this student is interested.
4. When working on classwork, this student seems to enjoy it.
5. For this student, learning seems to be fun.

Behavioral Disaffection

1. When we start something new in class, this student thinks about other things. (–)
2. In my class, this student comes unprepared. (–)
3. When faced with a difficult assignment, this student doesn't even try. (–)
4. In my class, this student does just enough to get by. (–)
5. When we start something new in class, this student doesn't pay attention. (–)

Emotional Disaffection

1. a. When we work on something in class, this student appears to be bored. (–)
b. When doing work in class, this student looks bored. (–)

2. a. When working on classwork, this student seems worried. (–)
b. In my class, this student is anxious. (–)
3. a. In class, this student seems unhappy. (–)
b. In my class, this student appears to be depressed. (–)
4. a. In my class, this student is angry. (–)
b. When working on classwork, this student appears frustrated. (–)
5. a. When I explain new material, this student doesn't seem to care. (–)
b. When working on classwork in my class, this student seems uninterested. (–)

Note. Adapted from Wellborn (1991). The items added to the Emotional Disaffection subscale can be used to tap the more differentiated disaffected emotions.

Appendix F

Patterns of Adaptive Learning Scales: Student Survey Items

1. I'm certain I can master the skills taught in class this year.
2. I would avoid participating in class if it meant that other students would think I know a lot.
3. It's important to me that I don't look stupid in class.
4. Even if I do well in school, it will not help me have the kind of life I want when I grow up.
5. If other students found out I did well on a test, I would tell them it was just luck even if that wasn't the case.
6. When I've figured out how to do a problem, my teacher gives me more challenging problems to think about.
7. I would prefer to do class work that is familiar to me, rather than work I would have to learn how to do.
8. It's important to me that other students in my class think I am good at my class work.
9. It's important to me that I learn a lot of new concepts this year.
10. My teacher presses me to do thoughtful work.
11. I'm certain I can figure out how to do the most difficult class work.
12. Some students fool around the night before a test. Then if they don't do well, they can say that is the reason. How true is this of you?
13. My chances of succeeding later in life don't depend on doing well in school.
14. I sometimes annoy my teacher during class.
15. My teacher asks me to explain how I get my answers.

16. Some students purposely get involved in lots of activities. Then if they don't do well on their class work, they can say it is because they were involved with other things. How true is this of you?
17. When I'm working out a problem, my teacher tells me to keep thinking until I really understand.
18. Some students look for reasons to keep them from studying (not feeling well, having to help their parents, taking care of a brother or sister, etc.). Then if they don't do well on their class work, they can say this is the reason. How true is this of you?
19. My teacher doesn't let me do just easy work, but makes me think.
20. I don't like to learn a lot of new concepts in class.
21. I wouldn't volunteer to answer a question in class if I thought other students would think I was smart.
22. I sometimes copy answers from other students during tests.
23. I prefer to do work as I have always done it, rather than trying something new.
24. If I did well on a school assignment, I wouldn't want other students to see my grade.
25. One of my goals in class is to learn as much as I can.
26. One of my goals is to show others that I'm good at my class work.
27. It's very important to me that I don't look smarter than others in class.
28. Doing well in school doesn't improve my chances of having a good life when I grow up.

29. One of my goals is to master a lot of new skills this year.
30. I sometimes get into trouble with my teacher during class.
31. I sometimes cheat on my class work.
32. Getting good grades in school won't guarantee that I will get a good job when I grow up.
33. One of my goals is to keep others from thinking I'm not smart in class.
34. I sometimes behave in a way during class that annoys my teacher.
35. I like academic concepts that are familiar to me, rather than those I haven't thought about before.
36. Even if I am successful in school, it won't help me fulfill my dreams.
37. If I were good at my class work, I would try to do my work in a way that didn't show it.
38. It's important to me that I thoroughly understand my class work.
39. I sometimes copy answers from other students when I do my class work.
40. I would choose class work I knew I could do, rather than work I haven't done before.
41. One of my goals is to show others that class work is easy for me.
42. Some students let their friends keep them from paying attention in class or from doing their homework. Then if they don't do well, they can say their friends kept them from working. How true is this of you?
43. Doing well in school won't help me have a satisfying career when I grow up.
44. Some students purposely don't try hard in class. Then if they don't do well, they can say
it is because they didn't try. How true is this of you?

45. One of my goals is to look smart in comparison to the other students in my class.
46. One of my goals in class is to avoid looking smarter than other kids.
47. Some students put off doing their class work until the last minute. Then if they don't do well on their work, they can say that is the reason. How true is this of you?
48. It's important to me that I look smart compared to others in my class.
49. It's important to me that I improve my skills this year.
50. I sometimes don't follow my teacher's directions during class.
51. It's important to me that my teacher doesn't think that I know less than others in class.
52. I can do almost all the work in class if I don't give up.
53. My teacher makes sure that the work I do really makes me think.
54. I sometimes disturb the lesson that is going on in class.
55. One of my goals in class is to avoid looking like I have trouble doing the work.
56. Even if the work is hard, I can learn it.
57. My teacher accepts nothing less than my full effort.
58. I can do even the hardest work in this class if I try.