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Exploring the Developmental Dynamics of Motivational Resilience Over the Transition to Middle School

Jennifer Rose Pitzer
Portland State University

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Exploring the Developmental Dynamics of Motivational Resilience
Over the Transition to Middle School

by

Jennifer Rose Pitzer

A dissertation submitted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy
in
Applied Psychology

Dissertation Committee:
Ellen A. Skinner, Chair
Robert W. Roeser
Joel S. Steele
Pat Burk

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Abstract

In recent years students' academic engagement has gained increasing favor as a necessary component of authentic learning experiences. However, less research has focused on what students do when they run into everyday problems in school that allows them to return (or not) to a state of ongoing engagement. Expanding on these ideas, this project explores students' *motivational resilience* in school, that is, the dynamic interactions among their ongoing engagement, emotional reactivity, academic coping, and re-engagement after encounters with difficulties and setbacks in school. Grounded in an established motivational model based on Deci & Ryan's (1985) self-determination theory, and building on earlier studies suggesting that these components of motivational resilience form self-reinforcing internal dynamics (Skinner, Pitzer, & Steele, 2015), this project comprises two free-standing manuscripts that examined key components of this process.

Study 1 explored the external dynamics of motivational resilience within a single school year to identify the extent to which outside forces (e.g., students' experiences of teacher support and self-system processes) can shape students' motivational systems which tend to be self-sustaining. The study used data from 1020 3rd through 6th grade students to examine feedforward and feedback effects between students' composite motivational resilience and a set of hypothesized antecedents and consequences, and also investigated whether teacher support can shift established motivational patterns.

Study 2 looked more closely at motivational resilience and its antecedents and consequences as students made the transition from elementary to middle school. Data following 281 students as they moved from fifth to sixth grade were used to test a structural model examining the extent to which students' ongoing engagement and teacher support act as resources that encourage adaptive coping and re-engagement, which then lead to continued engagement and subsequent achievement. Students' coping was explored as a particularly important mediator between students' resources at the beginning of fifth grade and their subsequent motivational actions and achievement. The study also examined differences in patterns of motivation across the transition for students who had high levels of teacher support and adaptive coping profiles as compared with students who had fewer of such resources.

This project provides a deeper understanding of students' experiences in dealing with everyday challenges and struggles in school, especially during the transition to middle school. Discussion focuses on the utility and potential drawbacks of examining the individual components of students' motivational resilience through this conceptual lens, with suggestions for next steps for future research. Implications of this model for improving students' academic development highlight the important role teachers can play in supporting or undermining students' ability to bounce back after encounters with setbacks.

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Chapter 1

Introduction

In recent years, research targeting students' academic engagement has been substantial. This work has been essential for developing a clear understanding of the construct and identifying its antecedents and consequences. Engagement, defined as students' ongoing, active, enthusiastic participation in learning activities, is well established in its role as a protective factor against negative outcomes such as low school achievement, gang involvement, and school dropout (Appleton, Christenson, & Furlong, 2008; Archambault, Janosz, Morizot, & Pagani, 2009; Christenson, Reschly, & Wylie, 2012; Finn & Rock, 1997; Finn & Zimmer, 2012; Wang & Fredricks, 2014). Conversely, disaffection, marked by boredom, passivity, or apathy, has been shown to exacerbate these risky behaviors (Blondal & Adalbjarnardottir, 2012; Finn, 1989; Henry, Knight, & Thornberry, 2012; Li & Lerner, 2011; Morrison, Robertson, Laurie, & Kelly, 2002).

Engagement is a necessary condition for real learning to take place (Reeve, 2012; Skinner & Pitzer, 2012), and shapes students' everyday experiences in school via its effects on their relationships with teachers and peers. In addition to its influence on students' school experiences, enthusiasm is particularly high for the construct of engagement because of its malleability: Unlike "status" predictors, such as student gender or socio-economic status, engagement can be changed over time (Fredricks, Blumenfeld, & Paris, 2004).

However, engagement itself is only one piece of the puzzle – what happens when students run into the inevitable struggles inherent in their school experience? It is essential to study, too, how students cope with these setbacks. How much distress do they experience? What strategies do they use? Do they ultimately respond by bouncing back from the struggle or by giving up? If engagement is, as posited, a necessary condition for learning, then it is vitally important to understand what leads students to *re-engage* with academic tasks after challenges and setbacks as well.

Until very recently, these processes have been studied relatively independently (e.g., Pitzer, 2010; Skinner, Furrer, Marchand, & Kindermann, 2008; Skinner & Wellborn, 1997). Researchers are just beginning to bring these important processes under the same umbrella, within the conceptualization of *motivational resilience* (Skinner & Pitzer 2012; Skinner, Pitzer, & Brule, 2014; Skinner, Pitzer, & Steele, 2013, 2015), which explores the dynamic interactions among students' ongoing engagement, emotional reactivity, coping, and re-engagement in the face of difficulties and setbacks in school (see Figure 1.1). Specifically, this model posits that students' ongoing engagement in school is an energetic resource, such that students who are more highly engaged in school will be better able to deal with the downward pressure that encounters with problems and obstacles place on their motivation, allowing them to utilize more adaptive coping strategies and ultimately to re-engage with challenging tasks rather than giving up. In contrast, students who are disaffected will be less equipped to deal constructively with such challenges, leading them to use more

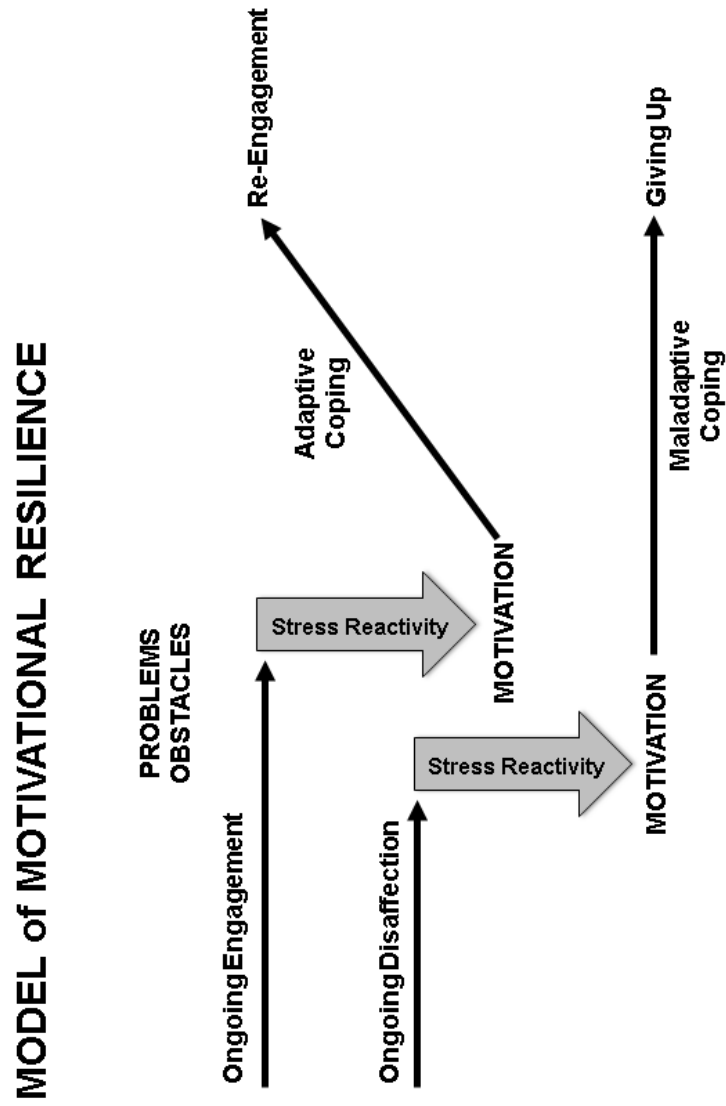


Figure 1.1. Model of Motivational Resilience

maladaptive coping strategies and culminating in an increased likelihood of giving up rather than persevering in the face of difficulty.

Using the same motivational model developed to study the processes of engagement and coping in previous research, known as the Self-System Model of Motivational Development (SSMMD; Connell & Wellborn, 1991; Skinner & Wellborn, 1994; Skinner et al., 2008), current research is attempting to integrate these essential components of students' academic development and understand their links to important interpersonal contexts and scholastic outcomes. The studies contained within this project will expand on preliminary work in this area that has demonstrated the functionality of a new measure of academic coping (Skinner et al., 2013) and its role in motivational resilience (Skinner et al., 2015; see Appendix A).

Specifically, the goals of the current studies are threefold: (1) to look at motivational resilience within the structure of the established motivational model (SSMMD) in an attempt to identify potential levers for intervention (e.g., teacher support) and explore how those supports affect future action; (2) to examine whether students' motivational resilience is connected to their educational outcomes (i.e., achievement); and (3) to investigate whether ongoing engagement helps students to more successfully navigate the transition to middle school – that is, to cope more constructively over time, and re-engage rather than give up when faced with challenges and setbacks in school.

This project is organized as follows: Chapter 2 provides a brief review of the current literature organized around the components of motivational resilience (engagement versus disaffection, emotional reactivity, coping, and re-engagement), as well as their known antecedents and consequences. Chapters 3 and 4 are designed to be developed into free-standing manuscripts; Chapter 3 describes a study that explores the external dynamics of motivational resilience over the course of a single school year, and Chapter 4 describes a study that examines whether students' ongoing engagement and teacher support at the beginning of fifth grade can, via its effects on their coping and re-engagement, help them to maintain their engagement as they make the transition to middle school. Finally, Chapter 5 integrates the findings from the two studies and explores the utility of this conceptualization of motivational resilience, followed by a discussion of the project's strengths and limitations and implications of the studies and their contributions to the field.

Chapter 2

Literature Review

Evidence clearly supports the importance of students' academic engagement to important educational outcomes, making it a key player in their ongoing school success (Fredricks, Blumenfeld, & Paris, 2004). However, students also daily encounter challenges and struggles that can place strains on their motivation in school: they run into problems on homework or tests that they do not understand, have disagreements with teachers or peers, or make embarrassing mistakes in front of their classmates. These everyday experiences suggest that engagement alone is not sufficient to describe the range of motivational processes that students need to successfully navigate their school experiences. Certainly, students' ongoing engagement is crucial to their learning and other educational outcomes, but how they respond to challenges and setbacks is also vital.

Martin and Marsh (2008, 2009) refer to this important process of bouncing back after encounters with obstacles and setbacks in school as *academic buoyancy*, citing it as a key component of students' lives in school that is essential to both their more immediate school experiences and likely as a necessary condition for overall life resilience as well. It is important to note that this successful navigation of the daily ups and downs of school life is different from what is typically studied as *academic resilience*: The study of academic resilience focuses on students' recovery from overwhelming, ongoing challenges such as chronic school failure, truancy, or serious

daily anxiety, whereas Martin & Marsh's (2009) concept examines the day to day challenges that all students experience from time to time.

More recently, a similar construct has appeared in the arena of educational research. In an effort to increase student achievement in community college math courses, the Carnegie Foundation for the Advancement of Teaching has begun investigating what they call *productive persistence*, which focuses directly on students' abilities to bounce back from academic setbacks rather than becoming overwhelmed by them (Yeager, 2011). They define productive persistence as the combination of students' tenacity and their use of good strategies. That is, simple tenacity is not enough to achieve scholastic success: students must be adapting and integrating effective strategies as well. This ability to flexibly respond to challenges as they arise is essential for students' academic achievement.

Research suggests that these processes of everyday resilience might be particularly important for students as they undergo school transitions, such as the transition from elementary to middle school (Roeser, Urdan, & Stephens, 2009; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). This transition between fifth and sixth grade is a normative experience, as middle schools are currently the most common educational pathway for students (US Department of Education, 2014), but it is also typically a stressful time for students, given their parallel experiences of changes in themselves (i.e., puberty) coupled with the significant changes in their environments. However, not all students experience detrimental effects on their motivation during this

time. Individual differences in personal and social resources can help to explain the facility with which some students make this transition.

A prominent theoretical explanation for the students' differential experiences during this vulnerable transition is *stage-environment fit* (Eccles & Midgley, 1989; Eccles et al., 1993; Eccles & Roeser, 2009). The key idea is that as students move from one educational context to another, mismatch between the new contexts (e.g., with differences in classroom structure, teaching styles, or expectations) and students' current developmental needs will result in motivational declines. Conversely, to the extent that students' schools and classrooms provide supports that are congruent with their changing needs (e.g., for increased autonomy and continued closeness with teachers and peers), the negative impacts of the middle school transition will be mitigated. Thus, effective support of students' overall academic success, including their abilities to navigate the daily stresses of school life, must include continued attention to the alignment of students' needs and the contextual supports offered to them, particularly across the transition to middle school.

Model of Motivational Resilience

Together, students' ongoing engagement, emotional reactivity, constructive coping, and re-engagement after encounters with setbacks have been combined to form a model of *motivational resilience* (Skinner & Pitzer, 2012; Skinner, Pitzer, & Steele, 2013, 2015). This model describes students' ongoing engagement in school as an energetic resource that can reduce the effects of the downward pressure that is placed on

their motivation when they encounter obstacles and setbacks in school, propelling them toward more constructive ways of coping with those challenges and thus leading students to persevere rather than give up (see Figure 1.1). In contrast, students who are disaffected from school may be more likely to be hindered by challenging experiences, utilizing more maladaptive coping strategies that compel them to give up rather than to re-engage after encountering obstacles in school. Each component of the model is discussed below.

Engagement. In the quest to provide all students with an excellent education and to prepare them to be lifelong learners, much attention has been given to the study of motivation in learning. Focusing on more than simply school completion or standardized test scores, in recent decades considerable attention has converged on students' academic engagement versus disaffection as the key to their ultimate success in and enjoyment of school (Christenson, Reschly, & Wylie, 2012). Engagement is a dynamic, multidimensional construct that encompasses the cognitive, behavioral, and emotional components of students' interactions with learning activities – the process of their ongoing, active, attentive, and energized involvement in the learning task (Jimerson, Campos, & Greif, 2003; Marks, 2000; Skinner, Furrer, Marchand, & Kindermann, 2008). Engaged students show consistent participation in the task at hand, are excited and intrinsically motivated to participate, and show positive emotions such as curiosity, interest, and enjoyment. In contrast, disaffected students may demonstrate apathy, boredom, or passivity, indicating more than simply the absence of engagement:

Both are dynamic motivational states in their own right (Skinner, Kindermann, Connell, & Wellborn, 2009).

Engagement has been demonstrated to be a strong predictor of essential educational outcomes such as achievement, retention, and learning (e.g., Appleton, Christenson, & Furlong, 2008; Christenson et al., 2012; Finn & Rock, 1997; Finn & Zimmer 2012; Janosz, Archambault, Morizot, & Pagani, 2008; Klem & Connell, 2004; Ullah & Wilson, 2007). In contrast, disaffection is a risk factor for negative outcomes such as school drop-out, gang involvement, substance use, and other risky behaviors, whereas engagement plays a protective role against such outcomes (e.g., Blondal & Adalbjarnardottir, 2012; Finn, 1989; Li & Lerner, 2011; Morrison et al., 2002).

If the goal is for all children to obtain an excellent education, it is clear that their engagement in school is a vital component to achieving that outcome. However, disheartening disparities across race and socioeconomic status (SES) in educational opportunities and quality exist, such that individuals who begin in disadvantaged populations are unlikely to make up the lost ground without some sort of intervention. Thus, engagement is alluring for its malleability: Unlike “status predictors” such as race or SES, students’ levels of engagement have been shown to be changeable, and thus amenable to intervention (Fredricks et al., 2004; Holt, Bry, & Johnson, 2008; Martin, 2008; Stormshak, Fosco, & Dishion, 2010). This flexibility makes engagement of key interest to researchers and educators looking for practical levers with which to bolster important educational outcomes for all students.

Unfortunately, however, the relatively high levels of intrinsic motivation and engagement present when students begin school quickly and steadily decline (Anderman & Maehr, 1994; Fredricks & Eccles, 2002; Gottfried, Fleming, & Gottfried, 2001; Wigfield et al., 2006). From the moment students enter kindergarten and with marked decreases during school transitions (e.g., the transition to middle or high school), their levels of motivation for school decrease and disaffection increases, particularly for at-risk youth such as boys or students coming from low SES and ethnic minority backgrounds, who generally start lower and lose ground faster than their peers (Finn, 1989; Spencer, 2006; Wigfield et al., 2006). The study of engagement is vital to the study of education, because understanding its antecedents and predictors can help identify practical pathways for curbing and even potentially reversing these observed decreases in motivation, ultimately facilitating students' learning and achievement.

Emotional Reactivity. Students' initial negative emotional reactions to stressful experiences in school (i.e., their emotional reactivity) can vary in severity from student to student (Compas, 2009). To the extent that students respond to stressors in intense, highly negative ways (e.g., with increased anxiety, anger, or fear), the distress of the objective stressor that prompted the reaction can be amplified. Such strong emotional responses can compel individuals to respond in maladaptive ways and consume precious mental processing capacity (Hagger, Wood, & Stiff, 2010). In contrast, students can respond to a stressful event with relative equanimity, prompting little if any additional emotional distress and calmly paving a path toward adaptive

coping strategies (Weinstein, Brown, & Ryan, 2009). Rothbart (1994) emphasizes both this *reactivity* (i.e., the affective negative responses to the stressful event) and the corresponding *regulation* that is used to modulate the negative reactions.

In the proposed model of motivational resilience, it is suggested that students' ongoing engagement will help to curb emotional reactivity, therefore leaving more mental energy to be allocated to what the student will actually *do* to deal with the stressful event (i.e., coping), rather than requiring that energy to be used for controlling their emotional reactions (Hagger et al., 2010). However, according to preliminary research, it seems that students' engagement may not help them to modulate their negative emotional reactions. That is, although disaffection does seem to spur increases in emotional reactivity (Skinner et al., 2015; see Appendix A), highly engaged students can still respond to problems and setbacks with negative reactions like fear or anxiety and still manage to cope effectively and bounce back following the stressful encounter (see Luthar, 1991). Regardless, students' emotional reactivity was shown to undermine their use of adaptive coping strategies (e.g., strategizing, commitment) and to increase their reliance on maladaptive strategies (e.g., rumination, confusion) over the school year (Skinner et al., 2015). Additionally, the contribution of emotional reactivity to this process may be especially critical to consider for students as they transition from elementary to middle school, as adolescence is in general a time of heightened reactivity (Arnett, 1999; Dahl & Gunnar, 2009; Gunnar, Wewerka, Frenn, Long, & Griggs, 2009; Quevedo, Benning, Gunnar, & Dahl, 2009; Spear, 2009).

Academic Coping. The majority of research on young people's coping has investigated their attempts to deal with major life events or crises that only a relatively small (though very significant) portion of children face, such as divorce, parental bereavement, major illness, war, or natural disasters (Garmezy, 1983; Wolchik & Sandler, 1997). However, youth's ability to successfully navigate the day-to-day challenges that they encounter has also been shown to be essential to their wellbeing (Band & Weisz, 1988; Compas, 1987; Seiffge-Krenke, 2000). Indeed, one of the main contexts in which children spend their time, school, is consistently reported to be among the top stressors they report, in addition to interpersonal problems with parents, siblings, and peers (Boekaerts, 2002; Spirito, Stark, Grace, & Stamoulis, 1991). Moreover, children's development of adaptive coping strategies to deal with everyday stressors may help to buffer them from the effects of more major life events (Eisenberg, Fabes, & Guthrie, 1997).

Students' encounters with challenges and setbacks in school require them to employ everyday coping strategies. According to Lazarus and Folkman (1984), coping is part of a transactional process that includes individuals' appraisals of the situation as taxing their available resources (i.e., identifying the situation as stressful) and their subsequent actions (i.e., the coping itself). In other words, coping is "action regulation under stress" (Skinner & Zimmer-Gembeck, 2007, p. 122), or what people *do* in the face of challenge or threat. This regulation is essential to individuals' healthy adaptation (Eisenberg et al., 1997). In the academic context, then, the study of coping

focuses on the actions students take in their attempts to deal with the challenges and struggles they encounter in the classroom. This is important because it is these actions that shape whether students can recover successfully from the difficult experience and emerge ready and willing to learn.

Just as within the larger domain of coping, where there is no consensus about which particular strategies to include as part of the construct (Skinner, Edge, Altman, & Sherwood, 2003), there is also no agreement about which ways to measure for academic coping. However, within the broader coping literature, reviews have identified 12 key “families” of coping strategies, including six adaptive families (i.e., problem-solving, information-seeking, self-reliance, support-seeking, accommodation, and negotiation) and six maladaptive families (i.e., helplessness, escape, social isolation, delegation, submission, and opposition), each of which can encompass multiple ways of coping (Skinner et al., 2003). These families can also be helpful in organizing and understanding how children and adolescents deal with the everyday struggles they encounter, articulating a “menu” of possible coping responses that could be utilized in the face of stress. Table 2.1 outlines multiple ways of coping that are contained within each family.

Among the measures that have been used to capture students’ coping with everyday academic stressors, almost all of the strategies measured can be found to be a member of one of these families put forth by Skinner and her colleagues (2003). For example, Causey & Dubow (1992) measured four styles of students’ coping strategies:

Table 2.1

Links between 12 higher-order families of coping and adaptive processes

Family of Coping	Ways of Coping	Family Function
1. Problem-solving	Strategizing Instrumental action Planning	Adjust actions to be effective
2. Information seeking	Reading Observation Asking others	Find additional contingencies
3. Helplessness	Confusion Cognitive interference Cognitive exhaustion	Find limits of actions
4. Escape	Behavioral avoidance Mental withdrawal Denial Wishful thinking	Escape non-contingent environment
5. Self-reliance	Emotion regulation Behavior regulation Emotional expression Emotion approach	Protect available social resources
6. Support-seeking	Contact seeking Comfort seeking Instrumental aid Social referencing	Use available social resources
7. Delegation	Maladaptive help-seeking Complaining Whining Self-pity	Find limits of resources
8. Social Isolation	Social withdrawal Concealment Avoiding others	Withdraw from unsupportive context
9. Accommodation	Distraction Cognitive restructuring Minimization Acceptance	Flexibly adjust preferences to options
10. Negotiation	Bargaining Persuasion Priority-setting	Find new options
11. Submission	Rumination Rigid perseveration Intrusive thoughts	Give up preferences
12. Opposition	Other-blame Projection Aggression	Remove constraints

Note. Adapted from Zimmer-Gembeck & Skinner (2011)

seeking social support, problem-solving, distancing, and emotional reaction. Both Support-seeking and Problem-solving are prototypical members of adaptive coping families, distancing is a form of Escape, and emotional reaction included both internalizing and externalizing reactions from students, which would be encompassed by the Submission and Opposition families, respectively. Table 2.2 outlines a number of the most frequently used academic coping scales, identifying the ways of coping encompassed by each measure and illustrating their positions within the proposed families of coping. As can be seen, with few exceptions, each of the ways of coping typically measured in academic settings are encompassed within these families of coping. Notably, several of these ways of coping have been reported by students cross-culturally and across age and gender (Gelhaar et al., 2007).

Together, these ways of coping form a menu of possible responses when students encounter obstacles and setbacks in school. Evidence suggests that the selection of adaptive ways of coping (i.e., strategizing, comfort-seeking, help-seeking, self-encouragement, commitment, or negotiation) results in more positive outcomes, both in academic settings and in life more generally (Frydenberg & Lewis, 1999). For example, students who utilized positive, action-oriented strategies such as finding out what they did wrong or asking for help showed higher levels of academic achievement, perceived competence, and self-concept (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Mantzicopoulos, 1990, 1997; Marchand & Skinner, 2007). In contrast, students who used maladaptive coping strategies (i.e., confusion, escape,

Table 2.2

Most frequently used measures of academic coping

Study	Ways of Coping	Brief Definition/Example Items	Family
Ayers et al. (1996)	1. Cognitive decision making	Planning, thinking of various ways to solve the problem	Problem-solving
	2. Problem-focused support	Seeking instrumental aid from others (e.g., advice, information)	Information-seeking
	3. Seeking understanding	Attempts to better understand & find meaning in the situation	Information-seeking
	4. Expressing feelings	Overt expression of feelings (e.g., verbal expression, action, release of emotions)	Self-reliance
	5. Distracting actions	Behavioral ways to avoid thinking about the stressful situation (e.g., doing a distracting activity)	Accommodation
	6. Cognitive avoidance	Cognitive ways to avoid thinking about the stressful situation (e.g., wishful thinking, fantasy)	Escape
	7. Direct problem-solving	Attempts to change the problem situation by changing self or environment	Problem-solving
	8. Positive cognitive restructuring	Thinking about the problem situation in a more positive way (e.g., optimistic thinking, acceptance)	Accommodation
	9. Emotion-focused support	Turning to others for support (e.g., to listen, provide understanding)	Comfort-seeking
	10. Physical release of emotion	Using physical activity to work off emotions (e.g., sports, play, physical relaxation)	Self-reliance
	11. Avoidant actions	Behavioral ways to avoid the stressful situation (e.g., leaving, avoiding it)	Escape

Study	Ways of Coping	Brief Definition/Example Items	Family
Causey & Dubow (1992, 1993)	1. Seeking social support	"Talk to the teacher about it"	Support-seeking
	1. Self-reliance/ Problem-solving	"Try to think of different ways to solve it"	Problem-solving
	3. Distancing	"Tell myself it didn't matter", "Refuse to think about it"	Escape
	4. Emotional reaction – Internalizing	"Go off by myself" "Worry too much about it" "Just feel sorry for myself"	Isolation Submission Delegation
	5. Emotional reaction – Externalizing	"Take it out on others because I feel sad or angry", "Get mad and throw or hit something"	Opposition
Ebata & Moos (1994)	1. Positive Reappraisal	Construe the problem in a positive way while still accepting the reality of the situation	Accommodation
	2. Logical Analysis	Understand the problem and mentally prepare for stressor and its consequences	Information-seeking Problem-solving
	3. Guidance/Support	Seek information, guidance, or support	Support-seeking
	4. Problem Solving	Take action and deal directly with the problem	Problem-solving
	5. Cognitive Avoidance	Avoid thinking realistically about a problem	Escape
	6. Resigned Acceptance	React to a problem by passively accepting it	Helplessness
	7. Alternative Rewards	Get involved in substitute activities and create alternative sources of satisfaction	Accommodation
	8. Emotional Discharge	Reduce tension by expressing negative feelings	Self-reliance

Study	Ways of Coping	Brief Definition/Example Items	Family
Lewis & Frydenberg (2002)	1. Seek Social Support	Share problem with others, get support	Support-seeking
	2. Focus on Solving the Problem	Tackle problem systematically, evaluate options	Problem-solving
	3. Work Hard and Achieve	Commitment, ambition, industry	Accommodation
	4. Worry	Concern about the future	Submission
	5. Invest in Close Friends	Spend time with intimate relationships	Support-seeking
	6. Seek to Belong	Concern about what others think	Submission
	7. Wishful Thinking	Optimism, hope for a positive outcome	Escape
	8. Social Action	Enlisting support from others with same concern	Support-seeking
	9. Tension Reduction	Feel better by releasing tension (drugs, alcohol)	Escape
	10. Not Cope	Inability to deal with the problem	Helplessness
	11. Ignore the Problem	Consciously not addressing the problem	Escape
	12. Self-Blame	View self as responsible for problem's existence	Submission
	13. Keep to Self	Withdraw, Keep others from finding out	Isolation
	14. Seek Spiritual Support	Prayer, belief in a spiritual leader	Support-seeking
	15. Focus on the Positive	Maintain positive and cheerful outlook	Self-reliance Accommodation
	16. Seek Professional Help	Go to teacher or counselor for assistance	Support-seeking
	17. Seek Relaxing Diversions	Pursue leisure activities	Accommodation
	18. Physical Recreation	Play sports and keep fit	Accommodation

Study	Ways of Coping	Brief Definition/Example Items	Family
Roth & Cohen (1986)	1. Seeking Social Support	"Talk to someone about how you feel"	Support-seeking
	2. Self-reliance	"Believe that you can work through the situation"	Self-reliance
	3. Distancing	"Go on as if nothing has happened"	Escape
	4. Wishful thinking	"Wish the situation would go away"	Escape
Seiffge-Krenke (1995)	1. Active coping	Seeking information or advice	Information-seeking
	2. Internal coping	Appraisal of the situation & internal reflection about possible solutions	Accommodation
	3. Withdrawal	Defenses such as denial, regression, or withdrawal	Problem-solving Escape
Skinner & Wellborn (1994)	1. Support-seeking (Help-seeking)	Turning to others for instrumental aid in learning	Information-seeking
	2. Isolation (Concealment)	Active attempts to conceal the stressful event and to prevent others from finding out about it	Isolation
	3. Problem-solving (Mastery)	Employing strategies to make the situation better, such as strategizing, planning, increasing effort	Problem-solving
	4. Helplessness (Confusion)	Difficulty figuring out what's happening & what to do next	Helplessness
	5. Accommodation (Cognitive Restructuring)	Reminding oneself of the personal value and worth of the stressful activity	Accommodation
	6. Opposition (Projection)	Blaming the teacher or exam for poor performance	Opposition

Study	Ways of Coping	Brief Definition/Example Items	Family
Spirito, Stark, Grace, & Stamoulis (1991)	1. Distraction	"I just tried to forget it"	Escape
	2. Wishful thinking	"I wished the problem had never happened"	Escape
	3. Blaming others	"I blamed someone else for causing the problem"	Opposition
	4. Emotional Regulation	"I yelled, screamed, or got mad", "I tried to calm myself down"	Self-reliance
	5. Social Support	"I tried to feel better by spending time with others like family, grownups, or friends"	Support-seeking
	6. Social Withdrawal	"I kept quiet about the problem", "I stayed by myself"	Isolation
	7. Self-criticism	"I blamed myself for causing the problem"	Submission
	8. Problem solving	"I tried to fix the problem by doing something or talking to someone"	Problem-solving
	9. Cognitive restructuring	"I tried to see the good side of things"	Accommodation
	10. Resignation	"I didn't do anything because the problem couldn't be fixed"	Helplessness
Stöber (2004)	1. Task Orientation and Preparation	"I think about how I can best prepare for my exams"	Strategizing
	2. Seeking Social Support	"I ask people who have had similar experiences that they did/would do in this situation"	Information-seeking
	3. Avoidance	"I put thoughts of the exams out of my mind"	Escape

Study	Ways of Coping	Brief Definition/Example Items	Family
Tero & Connell (1984)	1. Positive Coping	Actively seeking to remedy the causes of the perceived poor performance, ask for help	Problem-solving
	2. Projection	Blaming the teacher or other for the perceived failure	Opposition
	3. Denial	Denying the significance of the failure	Escape
	4. Anxiety amplification	Worrying, Self-denigration	Submission

concealment, self-pity, rumination, or projection) experienced more negative outcomes. For example, utilization of strategies such as withdrawing from social partners, concealment, or rumination was associated with less positive adjustment outcomes such as increases in internalizing and externalizing symptoms (Compas, Malcarne, & Fondacaro, 1988; Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000) and decreases in engagement over the school year (Marchand & Skinner, 2007). Moreover, Lewis and Frydenberg (2002) suggest that students' ineffective coping triggers additional coping of all kinds – both adaptive and maladaptive – and that an over-reliance on maladaptive strategies can inhibit their ability to use the adaptive strategies effectively.

The investigation of students' employment of coping strategies may be especially crucial to study as they transition to middle school, given the myriad of stressors that students are encountering during that period (Eccles et al., 1993). A few studies have looked at students' strategies during this transition, identifying positive outcomes (e.g., higher levels of general adaptation, decreases in depression and aggression) for students who utilize adaptive ways of coping, and more negative outcomes (e.g., psychological and somatic symptoms) for those who utilize maladaptive strategies (Causey & Dubow, 1993; Lohaus, Elben, Ball, & Klein-Hessbling, 2004; VanLede, Little, & Card, 2006).

The study of how students cope with challenges and setbacks in school is essential for understanding the process of motivational resilience, because it is what

students actually *do* in the face of stress that determines whether they will ultimately bounce back (i.e., re-engage) or give up, and it is this return to engagement that can propel students toward scholastic success. Encouragingly, strategies can be taught, and interventions to help students learn to cope more effectively can be implemented successfully in classroom settings (Pincus & Friedman, 2004). By better understanding how to bolster students' adaptive coping skills and the likelihood that they will use them (instead of relying on maladaptive strategies), educators can create classroom contexts that are conducive to students' re-engagement.

Re-engagement. In the effort to keep students involved and interested in school, the process of re-engagement is of primary importance. All students will encounter stressors and problems in school; re-engagement is the process that leads them to try again rather than to give up when those challenges are encountered. Importantly, this ability to bounce back following those setbacks has been shown to be important in its own right, over and above the effects of academic coping (Putwain, Connors, Symes, & Douglas-Osborn, 2012).

Paralleling the recent constructs of academic buoyancy (Martin & Marsh, 2008; 2009), productive persistence (Yeager, 2011), and grit (Duckworth, Peterson, Matthews, & Kelly, 2007), the importance of re-engagement to students' ongoing school success is not new or surprising. For decades, researchers have investigated differences in individuals' responses to challenges and failure. For example, beginning in the 1970s Martin Seligman's work on learned helplessness explored typical responses to exposure

to non-contingent and uncontrollable events (Maier & Seligman, 1976; Abramson, Seligman, & Teasdale, 1978). They found that as individuals learned that their actions had little to no effect on future outcomes, they would become increasingly likely to cease trying and give up altogether. This process culminates in a cycle of helpless behavior that continues to be manifest even in contingent environments (Nolen-Hoeksema, Girgus, & Seligman, 1986).

In the academic domain, Carol Dweck and her colleagues have explored students' actions in the face of failure. Based on classifications of students' goal orientations as either *mastery-oriented*, in which students attributed failure to lack of effort, or *helpless-oriented*, in which students attributed failure to lack of ability, this program of research began with an examination of elementary school students' reactions as they attempted to solve unsolvable puzzles (Diener & Dweck, 1978). In general, students who were classified as helpless focused on the causes of their failure, giving up quickly and blaming themselves and their abilities for their struggles in solving the puzzles. On the other hand, students who exhibited a mastery-orientation placed their focus on finding solutions to the problem, increasing their effort exertion and persevering with increasingly sophisticated strategies to find the solution. This delineation between students' mastery-oriented and helpless responses to challenge spurred decades of research exploring the antecedents and consequences of students' reactions to failure (Dweck, 1999, 2006).

In recent work, Martin (2011) found that students who persevered following encounters with academic challenges but were not overcome with anxiety about them exhibited the most positive scholastic and motivational outcomes, but that even for students who did struggle with fear and anxiety during these encounters, successfully persisting and regulating those negative emotions was a more adaptive response than those exhibited by students who showed helpless or avoidant tendencies.

Importantly, this work corroborates the Carnegie Foundation's work on productive persistence (Yeager, 2011), highlighting the necessity of constructive action (i.e., adaptive coping) when challenges are encountered while emphasizing many malleable factors that contribute to students' eventual re-engagement with the challenging material. For example, they identified five key "drivers" of students' productive persistence: (1) students' interest in the material and its relevance to their lives; (2) students' self-regulatory skills; (3) students' beliefs about their potential to grow and improve (i.e., their academic mindsets); (4) students' experiences of belongingness; and (5) instructors' abilities to engage their students and their beliefs about the students' abilities to improve (Carnegie Alpha Lab Research Network, 2012). These drivers can thus all assist in fostering a virtuous feedback cycle that can propel students toward learning and achievement. Additionally, it is promising that many successful interventions have been implemented to help students to respond more adaptively to failure (e.g., Blackwell, Trzesniewski, & Dweck, 2007), many of which

have targeted students during the transition to middle school, a crucial time in their educational trajectories.

This area of research emphasizes the importance of students' patterns of action following episodes of coping with challenges and setbacks in school. If engagement is a necessary condition for learning, then it is of primary importance whether students ultimately do re-engage after encounters with academic difficulties, maintaining motivation for school, or whether they instead give up, blocking them from the motivational states that have been demonstrated to propel students to success. Identifying potential levers with which to support students' re-engagement (and thus return them to the energized, enthusiastic motivational states that characterize engaged students with all the concomitant benefits) throughout their academic pathways is an essential task for all people who desire to positively impact young people's development.

Self-System Model of Motivational Development

A dynamic model of motivational development has been helpful in organizing and understanding complex constructs such as motivational resilience as well as their antecedents and consequences (e.g., Connell & Wellborn, 1991; Skinner & Wellborn, 1994; Skinner et al., 2008). Known as the self-system model of motivational development (SSMMD), this model describes the dynamic processes that give rise to individuals' motivated actions and their consequences (see Figure 2.1). Grounded in organismic models of intrinsic motivation such as Deci & Ryan's (1985, 2000) self-

determination theory (SDT), the model asserts that all humans have innate psychological needs that, when met by individuals' social contexts, will optimize their motivational outcomes. That is, having one's needs met will encourage interest and willing participation in the task at hand (e.g., to be actively engaged, to cope adaptively, or to re-engage after setbacks), whereas when these needs are thwarted individuals will be likely to withdraw, become frustrated, or act out (i.e., to become disaffected, to utilize maladaptive coping strategies, or to give up following challenging experiences). The SSMMD assumes that the quality of these actions (i.e., engagement versus disaffection, adaptive versus maladaptive coping, and re-engagement versus giving up) are observable markers of the individual's internal motivational states.

The three primary needs suggested by SDT include the need for *competence*, or the need to feel effective and in control with respect to one's environment; for *relatedness*, or the need to experience a sense of belonging and to have meaningful connections with significant social partners; and for *autonomy*, or the need to experience one's actions as originating from one's true and authentic self (Deci & Ryan, 1985). Based on ongoing dialectical interactions between these needs and individuals' experiences with their environments, over time people cumulatively construct views of themselves, known as self-system processes (SSPs), about whether they are competent to succeed, related to important others, and autonomous (Connell & Wellborn, 1991). These views of self are persistent beliefs about the world that consequently influence people's actions, as well as their interactions with social partners and contexts.

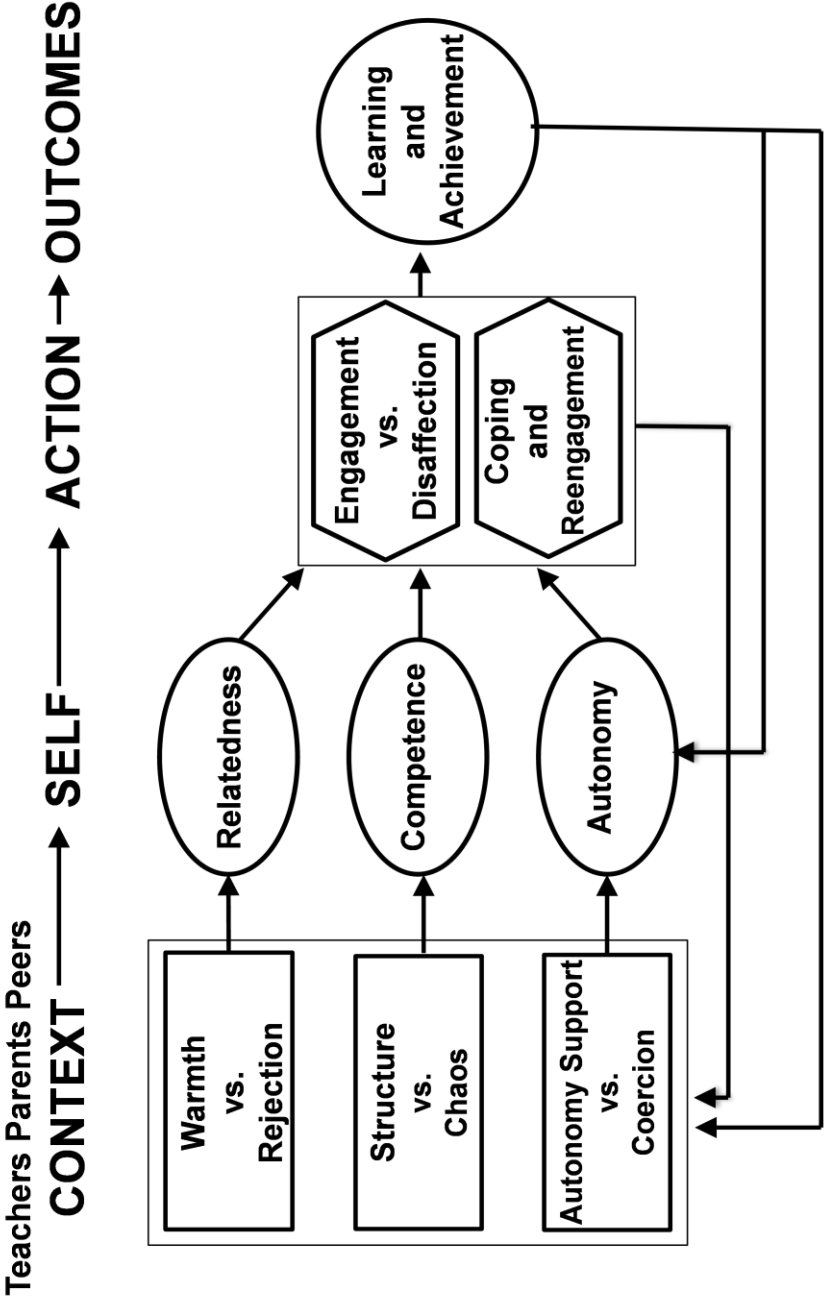


Figure 2.1. Self-System Model of Motivational Development

In turn, individuals' interactions with social partners such as parents, teachers, or peers make strong contributions to the fulfillment of these innate psychological needs. Without questioning the key roles of parents and peers in students' development (Wentzel, 1998), this project will look most closely at the effects of teacher-student interactions within the school context, specifically teachers' provision of *warmth versus rejection*, *structure versus chaos*, and *autonomy support versus coercion* to their students.

Supporting Motivational Resilience

Within the frameworks that have considered components of motivational resilience, there exists clear evidence for the importance of contextual supports and the SSPs that they cultivate. Teachers daily interact with students in ways that will either facilitate or hinder the satisfaction of their innate psychological needs and thus influence students' motivational resilience (Guay, Ratelle, & Chanal, 2008).

Self-system processes. A central assertion of the SSMMMD is that individuals' well-being is optimized when their contexts support (rather than thwart) their innate psychological needs for *relatedness*, *competence*, and *autonomy* (Connell & Wellborn, 1991; Deci & Ryan, 1985, 2000; Skinner et al., 2008). Students' appraisals of the extent to which they feel they belong at school, are competent to succeed, and are self-determined result from the ongoing history of dialectical interactions between their innate psychological needs and their social contexts. In contrast, students can also appraise stressful events that they encounter at school as having devastating effects on

their ability to meet these needs for relatedness, competence, and autonomy. These “catastrophizing” appraisals, which magnify the negative consequences of the stressful event (e.g., “nobody will like me,” “I’ll never learn how to do it,” or “It’ll never be the same for me again”), make students’ emotional reactions more intense and can increase their reliance on maladaptive coping strategies. Students’ SSPs can act as protectors from these negative catastrophizing appraisals and are key contributors to their motivational resilience in school.

Relatedness. Humans’ need for relatedness or belongingness has long been acknowledged as central to their development and motivation. Rooted in attachment theory, this need is based on the assertion that all humans come at birth with the desire to seek out positive connections with their caregivers (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969). This fundamental propensity for seeking out close relationships with others has been suggested to be essential for all people across the lifespan (Baumeister & Leary, 1995), and has been demonstrated to be important within multiple contexts, including schools.

Students’ motivated actions in school are directly influenced by their perceptions of relatedness to their teachers and peers, that is, of feeling like an accepted member of their school community or classroom where people care about their well-being and can be depended upon for help when needed. For example, students’ sense of connectedness has been demonstrated to support students’ ongoing engagement (Decker, Dona, & Christenson, 2007; Furrer & Skinner, 2003; Lynch & Cicchetti,

1997), achievement (Goodenow, 1993; Gutman & Midgley, 2000), and intrinsic motivation (Ryan, Stiller, & Lynch, 1994; Solomon, Watson, Battistich, Schaps, & Delucchi, 1996). Additionally, students' sense of relatedness also impacts the effectiveness of their coping and re-engagement, such that their feelings of connectedness with teachers and peers are related to increased effort and persistence in the face of failure (Cunningham, Werner, & Firth, 2004; Osterman, 2000).

Competence. Individuals also have an innate need to feel that they are effective in their interactions with their environments (White, 1959). Closely linked to work in self-efficacy (Bandura, 1977) and perceived control (Skinner, Zimmer-Gembeck, & Connell, 1998), this is the conception of oneself as having the ability to achieve desired outcomes and also to prevent those that are unwanted.

In schools, students' perceptions of competence have been shown to be an important predictor of their motivation, engagement, and reactions to challenge. Skinner and colleagues (1990) demonstrated that students' perceived control spurred increases in engagement and achievement across the school year, and numerous other studies have also shown students' competence-beliefs to be important to their achievement outcomes and motivation for school, including their effort and determination to persist at challenging tasks (Elliot & Dweck, 2005; Guay, Marsh, & Boivin, 2003; Wigfield & Eccles, 2000). Moreover, research has identified negative consequences for individuals when they do not feel like their actions lead to contingent reactions from the environment, namely, feelings of helplessness which can ultimately

result in students giving up after setbacks (Abramson et al., 1978)

Autonomy. Finally, individuals also need to experience their actions as self-determined, or originating and emanating from their own core self and desires, rather than feeling pressured or coerced into action (DeCharms, 1968; Deci & Ryan, 1985). Even for tasks that are not inherently intrinsically motivating, the extent to which individuals feel they are participating for reasons that are personally important to them (i.e., that they have internalized or integrated the value of the task) has been shown to provide increased energy for accomplishing the task (Deci & Ryan, 2000). It is important to note, however, that experiencing oneself as autonomous is not the same thing as being independent from others (Chirkov, Ryan, Kim, & Kaplan, 2003), but rather represents a wholehearted endorsement or assent to the task at hand.

Students' experiences of autonomy are essential to their motivation in school, though unfortunately the nature of school demands are not always naturally set up to support this need (Reeve, 2009). Students who report high levels of autonomously motivated actions show higher levels of academic achievement and engagement as well as increases in interest and enjoyment, and decreased anxiety (Black & Deci, 2000; Grolnick & Ryan, 1987; Hafen et al., 2012; Miserandino, 1996). Additionally, autonomously motivated students are more likely than their extrinsically motivated peers to choose optimally challenging tasks rather than easy ones (Boggiano, Main, & Katz, 1988), and to use more adaptive strategies in the face of challenges (Perry, 1998).

Contextual supports. The SSMMMD focuses on three facets of teacher-student relationships that can directly support or undermine students' needs for relatedness, competence, and autonomy: *Warmth vs. rejection*, *structure vs. chaos*, and *autonomy support vs. coercion*. These classroom interactions are strong predictors of both students' SSPs and their motivational states (e.g., Klem & Connell, 2004; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Reyes, Brackett, Rivers, White, & Salovey, 2012; Niemiec & Ryan, 2009; Skinner & Belmont, 1993; Skinner et al., 2008).

Teacher warmth vs. rejection. One of the primary contextual supports within the classroom environment involves the interpersonal relationships between the teachers and students (National Research Council, 2004; Wentzel, 2009). Often referenced in the literature as warmth, pedagogical caring (Wentzel, 1997), or teacher sensitivity (Pianta, Hamre, & Allen, 2012), this provision of attentive and kind involvement with students (i.e., spending time with them, being consistently available, knowledgeable, and affectionate) can foster the kinds of positive relationships that promote students' needs for relatedness and afford them the feelings of freedom and security that allow for authentic exploration and learning.

The positive effects of these high-quality teacher-student relationships on the components of students' motivational resilience are well documented (Pianta, 2006; Pianta et al., 2012). Students who report strong connections to their teachers have evinced more positive academic outcomes and motivation for school, including higher GPAs (Crosnoe, Johnson, & Elder, 2004; Hughes, Wu, Kwok, Villarreal, & Johnson,

2012), increases in school engagement (Anderson, Christenson, Sinclair, & Lehr, 2004; Woolley & Bowen, 2007), more interest in school (Wentzel, 1998), fewer disciplinary problems (Crosnoe et al., 2004), and higher motivation and self-esteem (Harter, 1996; Martin, Marsh, McInerney, Green, & Dowson, 2007). Students who lack these high-quality relationships with teachers also tend to be more at risk for negative outcomes such as dropping out of school (Wehlage & Rutter, 1986), not following rules (Wentzel & Asher, 1995), or experiencing decreases in academic growth (Spilt, Hughes, Wu, & Kwok, 2012).

These positive and protective effects of student-teacher relationships have been found to reach beyond students' ongoing academic achievement and motivation, to shape their ability to bounce back from everyday struggles in school. For example, in their work on academic buoyancy, Martin and Marsh (2009) highlight the importance of students' relationships with their teachers as crucial to students' persistence in the face of everyday obstacles and setbacks in school. Additionally, in the larger field of resilience work (see Luthar, 2006 for a review), the importance of even just one such close relationship with a caring adult (often a teacher) to at-risk students' development has been demonstrated consistently (Gambone, Klem, & Connell, 2002; Pianta, Hamre, & Stuhlman, 2003).

Clearly, close relationships with teachers are essential to the development of students' motivational resilience. However, Guay and his colleagues (2008) also emphasize the importance of teachers' involvement being offered in a structured and

autonomy supportive way. Thus, without questioning importance of warmth, it is also necessary to consider the influence of other contextual influences suggested by the SSMMD.

Structure vs. chaos. The extent to which teachers provide optimal structure to their students is also important for the support of students' motivational resilience. By providing students with clear explanations of what is expected of them and creating classroom contexts that are predictable and consistent, teachers can help to bolster students' feelings of competence and self-efficacy (Bandura, 1977; Skinner et al., 1998). Additionally, it is important for teachers to set high standards for their students that, in addition to being clearly communicated to the students, are developmentally calibrated such that the tasks are challenging but attainable with adequate help and support (Niemi & Ryan, 2009). In contrast, classroom contexts in which students are unclear about what is expected of them, receive little or no feedback about how to improve, or in which teachers are inconsistent or fail to follow through with stated consequences will negatively impact students' motivation in the classroom (Skinner et al., 1998).

The positive effects of teachers' provision of structure on students' engagement and motivation have been clearly demonstrated. Teachers who provide adequate structure and support to their students facilitate increases in self-regulated learning (Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009), school engagement (Skinner & Belmont, 1993; Tucker et al., 2002), and self-determined motivation (Seidel, Rimmele, & Prenzel, 2005). Moreover, students in well-structured environments report

lower levels of negative affect and depression (Mouratidis, Vansteenkiste, Michou, & Lens, 2013).

Positive effects of structure on coping and re-engagement have also been documented. Particularly, Alfi and his colleagues (2004) emphasized the importance of teachers structuring lessons in ways that allow for “temporary failure” – that is, that it is essential for students to have the possibility to falter when completing academic tasks, but for them to be confident that their teacher will be there to offer support and suggestions for strategies if needed. This type of well-structured environment helps students to learn new adaptive coping skills and to maintain their motivation for learning as they attempt new challenging tasks with the confidence they have the support needed to achieve them. Additionally, students who report well-structured (as opposed to chaotic) classroom environments demonstrate less use of avoidant strategies (Patrick, Turner, Meyer, & Midgley, 2003) and increases in their use of positive learning strategies over time, such as their reactions to challenging learning material (Mouratidis et al., 2013).

It is important to note that the positive effects of structure are enhanced by, and sometimes even dependent upon, the structure being offered in an autonomy supportive manner (Guay et al., 2008; Jang, Reeve, & Deci, 2010; Sierens et al., 2009). Rules and classroom policies that are enacted without explanation of their relevance to students’ well-being or without acknowledgement of their opinions can be interpreted as coercive rather than supportive. However, taken together, it is clear that teachers’ provision of

structure in the classroom is clearly beneficial to students' motivational resilience if provided in a caring manner that considers students' needs and desires.

Autonomy support vs. coercion. The importance of autonomy support to students' motivation and achievement outcomes has been receiving increasing attention over the past decade. Autonomy supportive contexts are those in which teachers provide students with the ability to have a say in their educational experiences: This can be accomplished via opportunities for shared decision-making, provision of choices about schoolwork, and explanations of the relevance of classroom activities to students' lives and interests. In contrast, students' autonomy is not supported by teaching strategies are experienced as being controlling or coercive, such as a strong reliance on external motivating factors for participation in learning activities (e.g., a focus on grades or rewards), or use of controlling language such as *should* or *must* (Reeve, 2009). Having the opportunity to express their true opinions and desires supports students' feelings of autonomy in the classroom (Reeve, 2002, 2006; Reeve & Jang, 2006; Taylor & Ntoumanis, 2007).

The effects of teachers' instructional styles on students' motivational and educational outcomes are well-documented. Students whose teachers utilize an autonomy-supportive teaching style show increases in intrinsic motivation and engagement (Hafen et al., 2012; Reeve et al., 2004; Reeve, Nix, & Hamm, 2003; Vallerand, Fortier, & Guay, 1997), higher achievement (Boggiano, Flink, Shields, Seelbach, & Barrett, 1993), deeper learning (Vansteenkiste, Simons, Lens, Sheldon, &

Deci, 2004; Grolnick & Ryan, 1987; Su & Reeve, 2011), more creativity (Koestner, Ryan, Bernieri, & Holt, 1984), higher interest and enjoyment (Black & Deci, 2000), and preference for challenging tasks (Boggiano et al., 1988). In contrast, students whose teachers utilized a more controlling or coercive teacher style were more likely to show decreases in intrinsic motivation (Ryan, Mims, & Koestner, 1983), experience increases in anxiety (Noels, Clément, & Pelletier, 1999), or drop out of school altogether (Vallerand et al., 1997).

Autonomy supportive contexts have also been shown to positively influence students' coping strategies and ability to re-engage after encounters with obstacles and setbacks. For example, Boggiano (1998) demonstrated that teachers' instructional styles (controlling vs. autonomy-supportive) impacted whether students' responses to stressful events would involve increased persistence to solve the problem (i.e., exhibiting a mastery-oriented rather than helpless response to the stressor). Moreover, students in this study who were taught in an autonomy supportive way were more likely than their peers to increase the sophistication of the strategies being used (an adaptive coping style), whereas the students being taught in a controlling manner tended to experience deterioration of their strategies after encounters with setbacks (a more maladaptive response). Similarly, Ryan and Grolnick (1986) showed that children who perceived their classrooms to be autonomy-supportive (rather than controlling) were more likely to exhibit an internal locus of control and to report increased curiosity, preference for challenge, and mastery motivation. Additionally, students who reported

their teachers to be autonomy-supportive showed decreases in anxiety across the school year (Black & Deci, 2000).

It is clear that the importance of autonomy support does not diminish the value of close and caring relationships or optimally structured environments, but is essential to motivational resilience in its own right. However, just as it is important for structure to be provided in an autonomy supportive manner, it is also crucial that the autonomy support offered to students be well-structured (Jang et al., 2010; Koestner & Losier, 2002). For example, there is a vast difference between a teacher who gives her students wide latitude for how to do their assignments, but without ample scaffolding, versus another who offers clearly structured but relevant choices to the students. Without careful navigation of the line between too much chaos and too much control, the motivational and educational benefits may not be realized.

These studies emphasize the importance of teachers' provision of autonomy-supportive environments for their students' motivational resilience. Autonomy support is essential to students' abilities to bounce back from everyday struggles they encounter in school, because it affords students a moment of pause in which they can reorganize their thinking and figure out what strategies to employ next in order to realize their own personal goals. Autonomy supportive environments foster intrinsic motivation, accountability, and ownership, each of which can give students access to additional energy during a crucial moment of challenge and help propel them to persist in the face of obstacles and setbacks in school.

Summary

The SSMMMD is a useful tool for organizing the complex constructs that make up students' motivational resilience that take place within dynamic systems such as schools over time. Particularly for individuals who are attempting to identify practical and tangible levers with which to raise students' engagement in and enjoyment of school, to promote their ability to cope constructively and to bounce back from obstacles and setbacks, this model allows researchers to tease apart the individual components of students' contexts and self-beliefs that may be influencing their motivation and its consequences in school, as well to identify how those actions and motivational states might reciprocally influence students' SSPs and the quality of support that is offered to them in the future. These ideas are the foundation upon which the two empirical studies described in Chapters 3 and 4 rest.

Chapter 3

External Dynamics of Motivational Resilience: Feedforward and Feedback Effects of Teacher Support and Self-systems on Students' Motivational Resilience

In recent years, research targeting academic engagement has established the role of students' ongoing, active, enthusiastic participation in learning activities as an important driver of learning, retention, and academic performance, as well as a protective factor against negative outcomes such as gang involvement and school dropout (Appleton, Christenson, & Furlong, 2008; Christenson, Reschly, & Wylie, 2012; Finn & Rock, 1997; Fredricks, Blumenfeld, & Paris, 2004; Janosz, Archambault, Morizot, & Pagani, 2008). In contrast, the boredom, passivity, apathy, or disruption marking students' disaffection from school has been shown to exacerbate these risky behaviors and contribute to underachievement (Blondal & Adalbjarnardottir, 2012; Finn, 1989; Henry, Knight, & Thornberry, 2012; Li & Lerner, 2011; Morrison, Robertson, Laurie, & Kelly, 2002).

Engagement has been lauded as a necessary condition for real learning to occur (Reeve, 2012; Skinner & Pitzer, 2012), and is considered important because it also shapes students' everyday experiences in school via effects on their relationships with teachers and peers (Kindermann, 2007; Skinner & Belmont, 1993). However, engagement itself is only one piece of the motivational puzzle – what happens when students encounter the inevitable struggles in school? It is essential to study, too, how students cope with these setbacks. If engagement is, as posited, a necessary condition

for learning, then it is also vitally important to understand what leads students to *re-engage* with academic tasks in the face of challenges and difficulties.

Model of Motivational Resilience

Although processes of engagement, coping, and re-engagement have typically been studied relatively independently (Boekaerts, 2002), in recent years these constructs have been brought together under the same umbrella, within the conceptualization of *motivational resilience* (Skinner, Pitzer, & Steele, 2013, 2015; Skinner & Pitzer, 2012), which explores the dynamic interactions among students' ongoing engagement, emotional reactivity, coping, and re-engagement in the face of difficulties and setbacks in school. As depicted in Figure 3.1, this model posits that students' ongoing engagement in school serves as an energetic resource, such that students who are more highly engaged in school are better able to utilize adaptive coping strategies and ultimately to re-engage with challenging tasks. In contrast, students who are disaffected are less equipped to deal constructively with such challenges, leading them to use more maladaptive coping strategies and culminating in an increased likelihood of giving up rather than persevering. Research suggests that the positive feedback loops among the components of the motivational system create a self-perpetuating *internal* dynamic over time that can sustain resilience for students who are initially high in engagement, but can also amplify motivational vulnerability for students initially high in disaffection (Skinner, Furrer, Marchand, & Kindermann, 2008; Skinner et al., 2015).

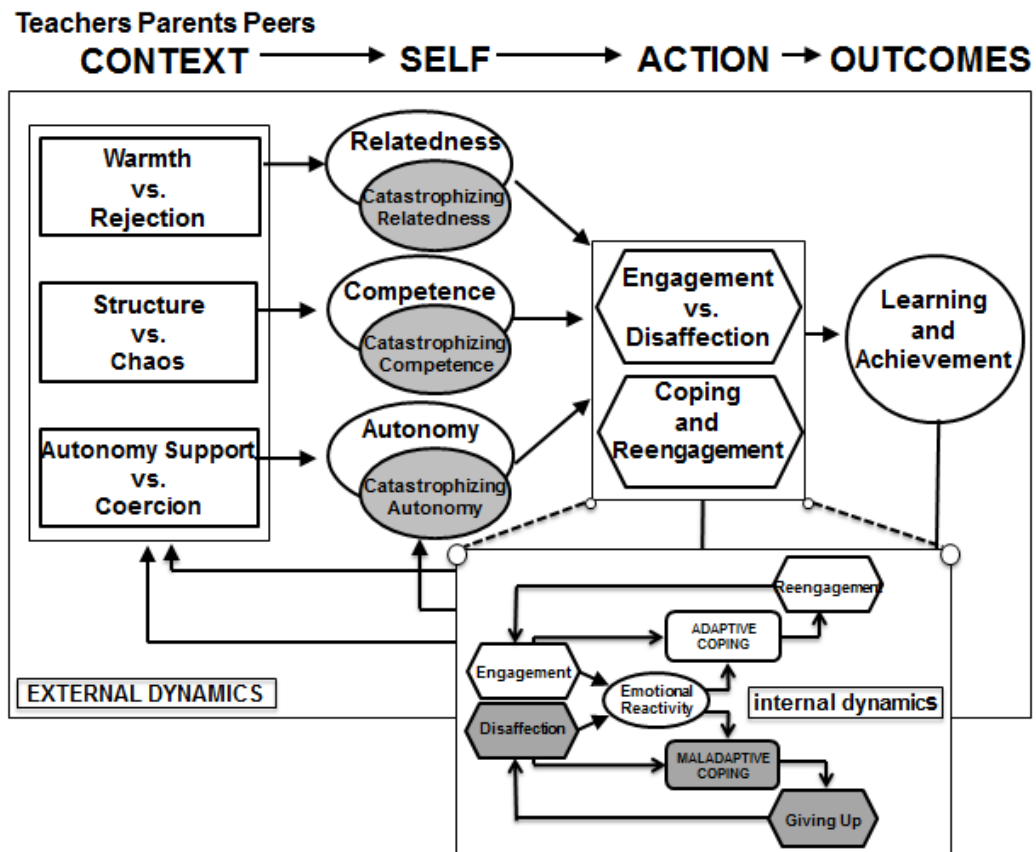


Figure 3.1. Model of internal and external dynamics of motivational resilience. Internal dynamics describe a self-reinforcing cycle wherein students’ ongoing engagement vs. disaffection in school influences their emotional reactions, coping strategies, and actions following challenges and setbacks. External dynamics demonstrate how students’ personal and interpersonal resources can either support or hinder their motivational resilience, which in turn influences their academic outcomes.

Purpose of the Current Study

Expanding on this work, the purpose of the current study was to examine the *external dynamics* of students' everyday motivational resilience: That is, to explore whether outside forces can re-shape students' otherwise self-sustaining systems of motivational resilience. Grounded in self-determination theory (SDT; Connell & Wellborn, 1991; Deci & Ryan, 1985), this study examined the links between students' motivational resilience and a set of antecedents and consequences suggested by the motivational model (see Figure 3.1). Utilizing data from 3rd – 6th grade students collected in fall and spring of the same school year, this study investigated external dynamics in three steps: First, it explored the relationship between students' motivational resilience and an important potential consequence, namely their school achievement, examining whether motivational resilience predicted changes in achievement across the school year, as well as whether evidence for the reciprocal relationship could be found. Second, proposed antecedents were examined in more depth, to determine whether students' experiences of *teacher support* and *self-appraisals* contributed to changes in their motivational resilience over the school year, and whether feedback effects from motivational resilience to teachers' support and students' self-appraisals were also present. Third, a special focus was the investigation of whether teacher support can, over time, shift already established motivational systems, exploring (1) whether, with high levels of teacher support, at-risk students caught in existing vicious cycles could begin to participate in more virtuous feedback

loops, and (2) whether low levels of teacher support could contribute to the emergence of motivational vulnerabilities, even for students who began the year with few indicators of risk.

Motivational Resilience and Academic Achievement

The study's first goal was to investigate the hypothesized reciprocal link between students' motivational resilience and their academic achievement. Because engagement is a necessary condition for learning and is well-established as a significant contributor to students' academic outcomes (Ladd & Dinella, 2009; Skinner & Pitzer, 2012), it follows that motivational resilience, which brings students back to this essential engaged state, would be related to students' learning and achievement. Therefore, we expected that each component of motivational resilience would be positively correlated with achievement at each time point (except Emotional Reactivity, which was expected to be negatively related). In addition, we expected motivational resilience to predict *changes* in students' academic achievement across the school year, such that students who began the year highly motivationally resilient would show improvements in their grades, whereas achievement would decline for those who were more motivationally vulnerable. Moreover, we expected to see a feedback effect of students' achievement on changes in their subsequent motivational resilience, based on the notion that, when a student learns and achieves more, this will add fuel to their ongoing engagement and persistence in the face of challenges, whereas continued academic struggles and failure add discouragement and frustration to disaffection,

increasing motivational vulnerability.

Supporting Motivational Resilience

The second goal of the study was to determine whether students' personal and interpersonal resources can shape their motivational resilience over time. According to SDT, the core idea is that students who perceive their interactions with teachers to be supportive and well-calibrated to their current needs will show more resilient responses in the face of setbacks and challenges, whereas students who lack this support will be at greater risk for developing motivational liabilities over time. For each type of resource, we were interested in whether higher levels of resources in fall predicted improvements in motivational resilience from fall to spring, whereas lower initial levels would predict decreases over the school year. We also examined whether these dynamics were invariant across grade and gender.

Personal resources. A central assertion of SDT is that individuals' well-being is optimized when their contexts support (rather than thwart) their innate psychological needs for *relatedness*, *competence*, and *autonomy* (Connell & Wellborn, 1991; Deci & Ryan, 1985). That is, students will best thrive when they feel they belong and are cared for, are effective in their interactions with their environments, and view their actions as originating from their own authentic core self and desires. Over time, a history of such experiences should cumulatively shape students' self-appraisals of competence, autonomy, and relatedness. Consistent with this notion, long histories of research in the areas of perceived control, self-determination, and attachment show that students'

positive self-appraisals predict multiple favorable motivational and academic outcomes (Niemic & Ryan, 2009; Roeser, Midgley, & Urdan, 1996; Ryan & Deci, 2000, 2009; Skinner, Zimmer-Gembeck, & Connell, 1998). In contrast, some students show a pattern of appraisals in which they interpret the stressful events they encounter at school as having devastating implications for their ability to meet their needs for relatedness, competence, and autonomy. These “catastrophizing” appraisals (e.g., “nobody will like me,” “I’ll never learn how to do it,” or “it’ll never be the same for me again”), because they magnify the negative consequences of stressful events, can intensify students’ emotional reactions and increase their reliance on maladaptive coping strategies (Skinner et al., 2013).

Interpersonal resources. In school, teachers are the social partners who have the greatest capacity to intentionally change the dynamics in the classroom. The motivational model focuses on three facets of teacher-student relationships that can directly support or undermine students’ needs for relatedness, competence, and autonomy. Supportive classroom interactions include *warmth* (i.e., caring interpersonal interactions, as opposed to *rejecting* relationships; Wentzel, 2009), *structure* (i.e., predictable and consistent classroom contexts, in contrast to *chaotic* environments; Skinner et al., 1998), and *autonomy support* (i.e., providing choice and explanations of relevance, versus *coercive* interactions; Reeve, 2009). These contextual supports are strong predictors of students’ personal resources as well as their motivational states and academic success (e.g., Hughes & Kwok, 2007; Klem & Connell, 2004; Niemic &

Ryan, 2009; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Reyes, Brackett, Rivers, White, & Salovey, 2012; Skinner et al., 2008).

Feedback from Motivational Resilience to Teacher Support and Self-system

Processes

As part of the proposed links between external supports and motivational resilience, this study also examined whether students' motivational resilience exerted reciprocal effects on teachers' provision of support across the school year and on their own self-system processes. When students are highly engaged and respond to challenges with increased effort, teachers' own engagement and enjoyment of teaching is bolstered (Klassen, Perry, & Frenzel, 2012; Spilt, Koomen, & Thijs, 2011), providing teachers with additional energy to invest in supporting their students. However, when students are disruptive, apathetic, or otherwise disaffected, teachers are more likely to struggle with providing ideal supports to their students, as teachers' natural inclinations are to pull back, become more controlling, and restrict students' privileges (Furrer, Skinner, & Pitzer, 2014). Thus, student-teacher relationships may exist in a dynamic feedback loop, such that students who are highly engaged tend to elicit teacher more support which in turn leads to further increases in motivation, whereas disaffected students attract more unsupportive teacher behaviors over time and consequently exacerbate their own motivational vulnerabilities (Skinner & Belmont, 1993; Van Ryzin, 2011). Moreover, higher levels of motivational resilience were also predicted to contribute to improvements in students' feelings of competence, autonomy, and

relatedness over time (Van Ryzin, Gravely, & Roseth, 2009).

Emotional Reactivity

In examining external dynamics, this study also investigated more closely the role of emotional reactivity, or the extent to which students become upset when they encounter academic setbacks. In previous research on the internal dynamics of this process (Skinner et al., 2015), the only exceptions to the directions of effects hypothesized by the model (see Figure 3.1) were found for emotional reactivity: It was *not* significantly related to students' re-engagement (although, as predicted, it did show positive connections with both disaffection and giving up), and students' engagement did not predict *changes* in emotional reactivity over the school year. These findings suggest that, although responding to stressors in a highly reactive manner cannot be considered adaptive, it is nevertheless possible for students who are actively engaged in school to respond to obstacles and setbacks by becoming upset. Likewise, students who become upset after encounters with setbacks, if distress is short-lived and followed by adaptive coping, can still successfully re-engage with the challenging material. Indeed, it seems likely that becoming emotionally upset after performing poorly has disadvantages, in that it disrupts subsequent performance, but it may also signal something positive, namely, caring about doing well on academic tasks. Thus, in the current study, we examined the role of emotional reactivity more closely to determine how it operates in the external dynamics of the system. For each analysis involving motivational resilience, we looked at its composite score both with and without the

inclusion of emotional reactivity to determine whether results differed based on its functioning in the process.

Motivational Vulnerability and Teacher Support

Finally, a special focus of the study was the empirical examination of the extent to which teachers can influence the motivational dynamics of the classroom by interrupting existing detrimental feedback loops and reestablishing positive motivational pathways. We expected that, even for students who began the year high in motivational vulnerabilities (as marked by high levels of catastrophizing), high teacher support would nonetheless be able to lift students off their expected downward motivational trajectories. In contrast, we expected that students who were *not* at-risk at the beginning of the school year (i.e., who reported low levels of catastrophizing) would nevertheless lose their motivational advantage if they experienced low levels of teacher support across the year.

Summary of Hypotheses

In summary, in order to investigate the external dynamics of students' motivational resilience across the school year, this study examined: (1) whether motivational resilience predicts changes in students' achievement scores across the school year, and whether achievement in turn predicts changes in motivational resilience over time; (2) whether proposed antecedents (i.e., interpersonal resources, personal resources, and catastrophizing appraisals) predict changes in students' motivational resilience over the school year; and whether motivational resilience

reciprocally affects students' personal and interpersonal resources; and (3) whether teacher support is a particularly important factor – one that can help students break out of vicious motivational cycles or, when lacking, one that can put students at risk for the development of motivational vulnerabilities. Throughout, the strength of each link in the model was examined to see whether including (or excluding) emotional reactivity seemed to affect the functioning of the construct of motivational resilience, as well as whether any of these links differed as a function of grade or gender.

Method

Participants

Data for this study were drawn from an existing longitudinal dataset that was part of a large, district-wide evaluation of a rural-suburban school district in upstate New York in which 1608 elementary and middle school students (grades 3 through 7) completed surveys about their engagement and coping in school. Fifty-three of their teachers also participated by completing questionnaires about their observations of and interactions with students. Data were collected using a cohort-sequential design, with data collected in fall (October) and spring (May) for four consecutive years.

Achievement scores were also obtained from school records for a subset of the participants. For a complete description of the larger study, see Skinner et al. (1998).

Information from a subset of these students from the third year of the project ($n = 1020$) was used for this study. Participants were a sample of 3rd through 6th grade students, including 138 3rd grade students (66 boys and 72 girls), 342 4th grade students

(172 boys and 170 girls), 170 5th grade students (78 boys and 92 girls), and 368 6th grade students (192 boys and 176 girls); two students were missing grade and/or gender data. The majority of students were Caucasian, with less than 5% identifying as non-white, and their families' socioeconomic status (determined by parent occupation and education level) were primarily working to middle class.

Procedures

Pairs of trained interviewers administered questionnaires to students during three 40-minute class sessions. In each session, one interviewer read the questions aloud to students as they marked their answers on the questionnaire, while the second circulated around the classroom to answer students' questions. The students' teachers were not present in the classroom during the data collection; most used the time to complete their own questionnaires.

Measures

Students completed sets of items tapping their experiences of *interpersonal resources*, appraisals of their *personal resources* (both self-system processes and catastrophizing appraisals); and of *motivational resilience*. Students rated all items using a 4-point Likert scale to indicate whether each item was (1) Not at all true for me, (2) Not very true for me, (3) Sort of true for me, or (4) Very true for me. All negatively worded items were reverse coded, and items were averaged within constructs to create composite scale scores. These scale scores could range from 1 to 4, with higher numbers indicating more of the respective construct.

Interpersonal resources: Teacher support. Students completed measures tapping their experiences of support from their classroom teachers along three dimensions (Skinner & Belmont, 1993): (1) *warmth versus rejection*, measured via 16 items tapping whether teachers spent time with students, showed them affection, and were available, knowledgeable, and dependable (e.g., “My teacher is always there for me”); (2) *structure versus chaos*, captured by 29 items tapping whether teachers offered clear expectations, contingent responses, help and support, and attuned teaching strategies (e.g., “Every time I do something wrong, my teacher acts differently,” reverse coded); and (3) *autonomy support versus coercion*, assessed using 21 items tapping the extent to which teachers provided students with choices, exerted control over them, offered respect for their ideas and opinions, and explained the relevance of learning activities (e.g., “My teacher gives me a lot of choices about how I do my schoolwork”).

Personal resources: Self-system processes. Students also responded to measures of their perceptions of relatedness, competence, and autonomy, as well as catastrophizing appraisals corresponding with each of those self-systems.

Self-system processes. Students’ sense of *relatedness* was measured using 20 items that described their feelings of connectedness and belonging to their teachers, mothers, fathers, friends, and classmates (Furrer & Skinner, 2003) via four items for each social partner (e.g., “When I am with my teacher, I feel accepted”). Perceived *competence* was measured using 27 items from the Student Perceptions of Control Questionnaire (Skinner, Wellborn, & Connell, 1990; e.g., “If I decide to learn something

hard, I can"). Perceptions of *autonomy* were measured using 17 items depicting reasons for participating in academic activities (Ryan & Connell, 1989), that varied on a continuum of self-regulation from external (e.g., "Because the teacher says we have to"), introjected (e.g., "Because I'll feel bad about myself if I don't do it"), identified (e.g., "Because I want to learn new things"), to intrinsic (e.g., "Because it's fun"). Summary scores averaged the four autonomy subscales, with external and introjected reverse coded.

Catastrophizing appraisals. Students also reported on three kinds of catastrophizing appraisals (Skinner et al., 2013). Nine items tapped *catastrophizing of relatedness*, in which appraisals of stressful events magnified their negative implications for interpersonal relationships (e.g., "When something bad happens to me in school (like not doing well on a test or not being able to answer an important question in class), I feel like I let everybody down."). Nine items targeted *catastrophizing of competence*, in which appraisals focused on negative events as demonstrating low ability and forecasting future problems (e.g., "I worry that I won't do well on anything."). Finally, nine items measured *catastrophizing of autonomy*, in which appraisals emphasized guilt, self-blame, or loss of self-worth (e.g., "I feel like it's all my fault.").

Motivational resilience. Students responded to measures of motivational resilience, including their engagement in school, emotional reactivity, academic coping, and re-engagement (Skinner, Kindermann, & Furrer, 2009; Skinner et al., 2013, 2015).

The four components were combined to form a summary score, with negative items (including the emotional reactivity subscale) reverse coded. An additional summary score was also calculated which excluded the emotional reactivity scale.

Engagement versus disaffection. Students responded to 25 items tapping their ongoing engagement versus disaffection in the classroom (Skinner et al., 2009): (1) five items measured behavioral engagement (e.g., “I work hard when we start something new in class”); (2) five tapped behavioral disaffection (e.g., “When I’m in class, I just act like I’m working”); (3) six measured emotional engagement (e.g., “When we start something new in school, I feel interested”); and (4) nine items tapped emotional disaffection, including boredom, frustration, or anxiety (e.g., “When I’m doing my work in class, I feel worried”).

Emotional reactivity. Students reported on 11 items measuring the extent to which they experience negative emotional responses when they encounter obstacles and setbacks in school (Skinner et al., 2013; e.g., “I get really upset when something bad happens in school”).

Academic coping. Students responded to 55 items tapping their academic coping in school (Skinner et al., 2013). Items were divided into 11 subscales consisting of five items each. Each subscale prompted students to describe their responses to stressful events in school, utilizing one of four different item stems (e.g., “When I have difficulty learning something...”). Five of the subscales measured students’ adaptive ways of coping, including (1) *Strategizing* (e.g., “I try to figure out what I did wrong so

that it won't happen again"); (2) *Help-Seeking* (e.g., "I ask the teacher to explain what I didn't understand"); (3) *Comfort-seeking* (e.g., "I discuss it with someone who will help me feel better about it"); (4) *Self-encouragement* (e.g., "I tell myself I'll do better next time"); and (5) *Commitment* (e.g., "I remind myself that it's something that I really want to do"). The six *maladaptive ways of coping* included (1) *Confusion* (e.g., "It's difficult for me to think"); (2) *Escape* or avoidance (e.g., "I say I didn't care about it"); (3) *Concealment* (e.g., "I don't tell anyone about it"); (4) *Self-pity* (e.g., "I ask myself, 'Why is this always happening to me?'"); (5) *Rumination* (e.g., "I can't get it out of my head"); and (6) *Projection*, or blaming others (e.g., "I say it was the teacher's fault"). *Profile scores* were computed which averaged the sets of adaptive and maladaptive coping scores, with the maladaptive scores reverse coded, indicating the balance of overall coping that was adaptive versus maladaptive (Skinner et al., 2013).

Re-engagement vs. giving up. Students reported on nine items tapping their reactions to encounters with challenges in school (Pitzer & Skinner, 2011). Four items tapped persistence or *re-engagement* (e.g., "If a problem is really hard, I keep working at it"), and five items tapped *giving up* (e.g., "If I don't understand something right away, I stop trying"). Items were averaged to form a summary score, with giving up items reverse coded.

Outcomes: Achievement. For a subset of students ($n = 365$), achievement data were available, including students' report card grades for reading, language arts, spelling, and math. Scores were converted from letter grades to numbers ranging from

1 (F or U-) to 12 (A or V), and composite scores were calculated by averaging students' grades across these subjects.

Results

Descriptive Information

All analyses were conducted using SPSS 22.0 (IBM Corp., 2013). Means, standard deviations, and internal consistencies for each variable at each time point are presented in Table 3.1. In general, students reported high levels of personal and interpersonal resources, and relatively low levels of catastrophizing appraisals. They were actively engaged in classroom activities, and reported moderate levels of emotional reactivity. When faced with challenges, they tended to utilize more adaptive than maladaptive coping strategies, and to persist after encounters with obstacles or setbacks. In school, students earned above-average marks, typically between a B and B-.

Correlations among all variables at both time points and their cross-time stabilities are presented in Table 3.2. As expected, engagement, coping, and re-engagement were positively and significantly related to one another, while emotional reactivity was negatively correlated with these constructs at both time points. Likewise, students' interpersonal resources, personal resources, and catastrophizing appraisals were all significantly related in both fall and spring as expected. For all constructs, as expected, cross-time stabilities were high, making it difficult to predict change over time due to the limited variance remaining after controlling for students' scores in fall.

Table 3.1

Summary of Descriptive Statistics for Each Construct in Fall and Spring.

<i>Construct</i>	No. of Items	<i>Fall</i>			<i>Spring</i>		
		<i>α</i>	<i>Mean</i>	<i>SD</i>	<i>α</i>	<i>Mean</i>	<i>SD</i>
Interpersonal Resources:							
Teacher Support	66	.95	2.98	.43	.96	2.93	.46
<i>Warmth (SR)</i>	16	.86	3.01	.50	.88	2.92	.53
<i>Structure (SR)</i>	29	.87	3.04	.42	.89	3.01	.44
<i>Autonomy Support (SR)</i>	21	.86	2.90	.47	.88	2.87	.49
Personal Resources: Self-System Processes	64	.89	3.15	.38	.90	3.09	.38
<i>Relatedness</i>	20	.85	3.33	.44	.88	3.34	.44
<i>Competence</i>	27	.79	3.14	.34	.81	3.09	.34
<i>Autonomy</i>	17	.78	2.98	.67	.78	2.83	.69
<i>External</i>	4	.74	2.79	.76	.76	2.72	.74
<i>Introjected</i>	4	.70	2.70	.73	.71	2.70	.67
<i>Identified</i>	5	.75	3.29	.60	.78	3.17	.62
<i>Intrinsic</i>	4	.85	2.67	.90	.87	2.48	.89
Catastrophizing Appraisals	27	.94	2.02	.59	.94	2.00	.58
<i>Cat of Relatedness</i>	9	.88	1.88	.65	.89	1.86	.64
<i>Cat of Competence</i>	9	.84	2.11	.65	.86	2.09	.64
<i>Cat of Autonomy</i>	9	.79	2.07	.59	.81	2.05	.58
Motivational Resilience	100	.78	3.03	.37	.81	3.01	.38
(Mot. Res. Sans Reactivity)	89	.82	3.19	.38	.84	3.13	.40
<i>Engagement vs. Disaffection</i>	25	.88	3.17	.44	.90	3.14	.45
<i>Emotional Reactivity</i>	11	.86	2.45	.63	.87	2.35	.61
<i>Coping Profile</i>	55	.86	2.98	.35	.87	2.94	.38
<i>Re-engagement vs. Giving Up</i>	9	.81	3.43	.48	.82	3.33	.49

Note. $N = 1020$ students in 3rd through 6th grade.

Table 3.2

Intercorrelations among Components of Motivational Resilience, among Personal Resources, among Interpersonal Resources, and among Catastrophizing Appraisals in Fall and Spring.

Motivational Resilience				
	<i>Engagement vs. Disaffection</i>	<i>Emotional Reactivity</i>	<i>Coping Profile</i>	<i>Re-engagement vs. Giving Up</i>
<i>Engagement vs. Disaffection</i>	.69	-.42	.77	.69
<i>Emotional Reactivity</i>	-.40	.56	-.39	-.21
<i>Coping Profile</i>	.77	-.37	.68	.72
<i>Re-engagement vs. Giving Up</i>	.74	-.21	.72	.61
Interpersonal Resources				
	<i>Warmth</i>	<i>Structure</i>	<i>Autonomy Support</i>	
<i>Warmth</i>	.59	.79	.80	
<i>Structure</i>	.81	.64	.82	
<i>Autonomy Support</i>	.83	.84	.59	
Personal Resources				
	<i>Relatedness</i>	<i>Competence</i>	<i>Autonomy</i>	
<i>Relatedness</i>	.61	.55	.30	
<i>Competence</i>	.57	.63	.41	
<i>Autonomy</i>	.32	.38	.64	
Catastrophizing Appraisals				
	<i>Cat. of Relatedness</i>	<i>Cat. of Competence</i>	<i>Cat. of Autonomy</i>	
<i>Cat. of Relatedness</i>	.62	.82	.80	
<i>Cat. of Competence</i>	.82	.63	.80	
<i>Cat. of Autonomy</i>	.80	.82	.61	

Note. $N = 1020$. Correlations for fall are above the diagonals. Correlations for spring are below the diagonals. Cross-time stabilities are reported on the diagonals. All correlations are significant at $p < .001$.

As explained in the Introduction, to learn more about the role of emotional reactivity, we decided to run all analyses that included motivational resilience twice, once with the construct including emotional reactivity and once excluding it; few differences were found.¹ Additionally, all analyses were examined for grade and gender interactions, which, with two exceptions, were not significant.²

Reciprocal Relationship Between Motivational Resilience and Academic Achievement

The first research question explored the relationships between students' motivational resilience and their academic achievement. We began by examining correlations among students' report card grades and components of their motivational resilience at both time points for the subset of students for whom achievement data were available ($n = 365$; see Table 3.3). As expected, motivational resilience was positively and significantly related to academic performance both in fall and in spring, slightly higher in spring (average $r = .20$) than in fall (average $r = .15$). The one exception was emotional reactivity, which was negatively correlated with the other components of motivational resilience as predicted, but not significantly related to achievement at either time point, which indicated that in addition to students who are high or low on both emotional reactivity and achievement, there also exist students who do well academically but still have strong negative reactions to problems and failures, as well as

¹ Findings for motivational resilience scores calculated without emotional reactivity were stronger only for analyses examining relationships with students' achievement scores.

² Only feed-forward effects for structure and relatedness were moderated by grade; for feedback effects, only overall catastrophizing and catastrophizing of relatedness were moderated by gender.

students who earn low grades but do not get upset about it. Because of this, we expected that the composite motivational resilience variable that excluded emotional reactivity would show stronger connections to achievement; in fact, this was the only area where inclusion or exclusion of emotional reactivity made a difference to the results.

Table 3.3

Correlations Among Components of Motivational Resilience and Achievement Scores.

<i>Construct</i>	Achievement	
	<i>Fall</i>	<i>Spring</i>
Motivational Resilience	.18 (.19)	.24 (.29)
<i>Engagement vs. Disaffection</i>	.17	.25
<i>Emotional Reactivity</i>	-.09 ^{ns}	-.02 ^{ns}
<i>Coping Profile</i>	.16**	.22
<i>Re-engagement vs. Giving Up</i>	.17	.31

Note. $n = 365$. Correlations in parentheses are for the motivational resilience construct sans emotional reactivity. All correlations are significant at $p < .001$ except as noted.

** $p < .01$. ^{ns} = not significant.

Of greatest interest were multiple regressions examining whether students' motivational resilience in fall predicted *changes* in their academic achievement from fall to spring. As expected, despite the high stability in achievement from fall to spring ($r = .75$), motivational resilience in fall (without emotional reactivity included) did

predict students' achievement in spring, even when controlling for fall achievement scores ($\beta = .10, p < .01$). Additionally, we examined whether reciprocal effects on students' motivational resilience were evident, in a second multiple regression analysis in which academic achievement was used as a predictor of students' motivational resilience in spring, controlling for their previous levels of motivational resilience; this regression also approached significance in the predicted direction ($\beta = .06, p = .06$), despite the high stability in motivational resilience from fall to spring ($r = .71$).³

Antecedents of Motivational Resilience

We also examined correlations between students' motivational resilience and each of the proposed antecedents from the model (see Table 3.4). As expected, in both fall and spring, motivational resilience was positively and significantly related to interpersonal and personal resources (average $r = .62$), whereas it was negatively and significantly related to catastrophizing appraisals (average $r = -.75$). Of all the antecedents, catastrophizing appraisals and perceptions of *competence* seemed to have the strongest concurrent relationships with motivational resilience.

³ With emotional reactivity included in the motivational resilience composite, motivational resilience in fall only marginally predicted changes in students' achievement from fall to spring ($\beta = .07, p = .07$), and the reciprocal effect of achievement on changes in students' motivational resilience did not reach significance ($\beta = .04, p = .24$).

Table 3.4
Correlations Among Components of Motivational Resilience and Students' Personal and Interpersonal Resources in Fall and Spring.

	Motivational Resilience		Engagement vs. Disaffection		Emotional Reactivity		Coping Profile		Re-engagement vs. Giving Up	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
Interpersonal Resources	.67 (.73)	.67 (.72)	.69	.70	-.25	-.24	.70	.69	.61	.60
<i>Warmth</i>	.60 (.67)	.59 (.64)	.63	.63	-.22	-.21	.64	.61	.55	.52
<i>Structure</i>	.65 (.73)	.66 (.73)	.66	.68	-.21	-.22	.69	.69	.63	.64
<i>Autonomy Support</i>	.62 (.66)	.64 (.68)	.63	.67	-.27	-.26	.64	.65	.54	.55
Personal Resources	.73 (.81)	.75 (.82)	.79	.81	-.28	-.26	.73	.74	.67	.69
<i>Relatedness</i>	.60 (.63)	.61 (.64)	.62	.63	-.28	-.28	.60	.58	.50	.53
<i>Competence</i>	.73 (.75)	.77 (.79)	.68	.73	-.37	-.36	.69	.70	.67	.73
<i>Autonomy</i>	.48 (.57)	.48 (.47)	.58	.59	-.10**	-.08*	.50	.52	.46	.45
<i>External</i>	-.34 (-.26)	-.32 (-.26)	-.29	-.28	.33	.30	-.29	-.25	-.16	-.18
<i>Introjected</i>	-.29 (-.10)	-.20 (-.02 ^{ns})	-.15	-.07*	.50	.45	-.13	-.03 ^{ns}	-.00 ^{ns}	.03 ^{ns}
<i>Identified</i>	.53 (.66)	.52 (.65)	.62	.63	-.06 [^]	-.00 ^{ns}	.59	.58	.58	.57
<i>Intrinsic</i>	.36 (.41)	.37 (.42)	.45	.47	-.11	-.11	.35	.38	.30	.30
Catastrophizing Appraisals	-.80 (-.67)	-.80 (-.66)	-.65	-.64	.67	.70	-.68	-.66	-.51	-.52
<i>Cat. of Relatedness</i>	-.72 (-.63)	-.72 (-.63)	-.60	-.59	.56	.57	-.64	-.63	-.49	-.51
<i>Cat. of Competence</i>	-.75 (-.60)	-.75 (-.60)	-.59	-.60	.69	.72	-.62	-.60	-.44	-.45
<i>Cat. of Autonomy</i>	-.77 (-.65)	-.77 (-.64)	-.62	-.62	.64	.67	-.66	-.63	-.51	-.50

Note. *N* = 1020. Correlations in parentheses are for the motivational resilience construct sans emotional reactivity.

All correlations are significant at *p* < .001 except as noted. ** *p* < .01. * *p* < .05.

Table 3.5
Multiple Regressions in which Students' Personal and Interpersonal Resources in Fall Predict Changes in Motivational Resilience from Fall to Spring.

<i>Predictor in Fall</i>	<i>Changes from Fall to Spring in</i>					
	Motivational Resilience	Engagement vs. Disaffection	Emotional Reactivity	Coping Profile	Re-engagement vs. Giving Up	
Personal Resources	$\beta = .12$ ($\beta = .16$)	$\beta = .24$	$\beta = -.06^*$	$\beta = .15$	$\beta = .20$	
<i>Relatedness</i>	$\beta = .063^*$ ($\beta = .03^{ns}$)	$\beta = .10^{**}$	$\beta = -.09^{**}$	$\beta = .06^\wedge$	$\beta = .07^*$	
<i>Competence</i>	$\beta = .079^*$ ($\beta = .09^{**}$)	$\beta = .13$	$\beta = -.06^*$	$\beta = .10^{**}$	$\beta = .19$	
<i>Autonomy</i>	$\beta = .06^*$ ($\beta = .09^{**}$)	$\beta = .12$	$\beta = -.01^{ns}$	$\beta = .09^{**}$	$\beta = .12$	
<i>External</i>	$\beta = -.05^*$ ($\beta = -.07^{**}$)	$\beta = -.06^{**}$	$\beta = .03^{ns}$	$\beta = -.10$	$\beta = -.08^{**}$	
<i>Introjected</i>	$\beta = -.04^\wedge$ ($\beta = -.05^*$)	$\beta = -.04^\wedge$	$\beta = .13$	$\beta = -.05^*$	$\beta = -.04^{ns}$	
<i>Identified</i>	$\beta = .06^*$ ($\beta = .08^*$)	$\beta = .10$	$\beta = -.01^{ns}$	$\beta = .10$	$\beta = .14$	
<i>Intrinsic</i>	$\beta = .05^*$ ($\beta = .07^{**}$)	$\beta = .10$	$\beta = .00^{ns}$	$\beta = .07^{**}$	$\beta = .09^{**}$	
Catastrophizing Appraisals	$\beta = -.163$ ($\beta = -.09^{**}$)	$\beta = -.12$	$\beta = .28$	$\beta = -.11^{**}$	$\beta = -.14$	
<i>Cat. of Relatedness</i>	$\beta = -.118$ ($\beta = -.07^*$)	$\beta = -.09^{**}$	$\beta = .21$	$\beta = -.08^{**}$	$\beta = -.12$	
<i>Cat. of Competence</i>	$\beta = -.138$ ($\beta = -.09^{**}$)	$\beta = -.11$	$\beta = .29$	$\beta = -.09^{**}$	$\beta = -.13$	
<i>Cat. of Autonomy</i>	$\beta = -.119^{**}$ ($\beta = -.08^{**}$)	$\beta = -.11$	$\beta = .21$	$\beta = -.10^{**}$	$\beta = -.13$	
Interpersonal Resources	$\beta = .074^*$ ($\beta = .09^{**}$)	$\beta = .11$	$\beta = -.04^{ns}$	$\beta = .14$	$\beta = .15$	
<i>Warmth</i>	$\beta = .059^*$ ($\beta = .07^*$)	$\beta = .08^{**}$	$\beta = -.03^{ns}$	$\beta = .12$	$\beta = .12$	
<i>Structure</i>	$\beta = .054^\wedge$ ($\beta = .07^*$)	$\beta = .09^{**}$	$\beta = -.03^{ns}$	$\beta = .11^{**}$	$\beta = .15$	
<i>Autonomy Support</i>	$\beta = .074^{**}$ ($\beta = .08^{**}$)	$\beta = .11$	$\beta = -.05^*$	$\beta = .12$	$\beta = .12$	

Note. N = 1020 students in grades three through six. Correlations in parentheses are for the motivational resilience construct

sans emotional reactivity. All regressions were significant at $p < .001$ except as noted, $** p < .01$. $* p < .05$. $^\wedge p < .10$.

Most interesting were analyses examining whether these proposed antecedents, both individually and in combination, could predict *changes* in students' motivational resilience over the school year. Despite the high stability of motivational resilience, multiple regression analyses revealed support for each of these antecedents and their sub-components as significant predictors of changes in students' motivational resilience (see Table 3.5). Students who were high in personal or interpersonal resources in fall showed increases in their motivational resilience across time, whereas students who reported high initial levels of catastrophizing appraisals tended to decrease in motivational resilience from fall to spring. There appeared to be some specificity in the feedforward effects; students' personal resources primarily predicted their engagement and re-engagement, catastrophizing appraisals predicted changes in emotional reactivity, while interpersonal resources most strongly predicted changes in coping profiles and re-engagement. At the same time, however, teacher support did not predict changes in emotional reactivity, indicating that students' interpersonal resources did not protect them from feeling bad when things went wrong.

Reciprocal Effects of Motivational Resilience on Changes in Personal and Interpersonal Resources

Because of the dynamic relationship between teachers and students in the classroom, we expected to find feedback effects from students' motivational resilience to changes in their personal and interpersonal resources: Despite high stabilities in the dependent variables, multiple regression analyses showed that motivational resilience

did predict *changes* in both students' personal and interpersonal resources from fall to spring (see Table 3.6). Students who began the school year high in motivational resilience experienced increases in their personal resources over time, including higher levels of perceived relatedness, competence, and autonomy (and decreases in their “catastrophizing” counterparts), while their more motivationally vulnerable peers showed the opposite pattern. Likewise, students who reported high levels of motivational resilience in fall experienced increased warmth, structure, and autonomy support from their teachers as the year progressed, whereas students low in motivational resilience attracted fewer of these interpersonal resources.

There appeared to be some specificity in these feedback loops indicating that motivational resilience seemed to pull students back out of catastrophizing, particularly of autonomy, and that students who took more initiative and bounced back were in turn granted additional freedoms by teachers (i.e., autonomy support). Moreover, students' motivational resilience in fall had a particularly strong effect on changes in their feelings of competence as the school year progressed; students who showed a greater capacity to rebound from struggles in the fall subsequently experienced higher perceptions of control, whereas students who were initially less motivationally resilient reported experiencing increases in helplessness.

Table 3.6
Multiple Regressions in which Motivational Resilience in Fall Predicts Changes in Students' Personal and Interpersonal Resources from Fall to Spring.

Predictor in Fall	Changes from Fall to Spring in:		
	Overall Personal Resources	Relatedness	Competence
Motivational Resilience	$\beta = .17^{***}$ ($\beta = .16^{***}$)	$\beta = .18^{***}$ ($\beta = .18^{***}$)	$\beta = .28^{***}$ ($\beta = .29^{***}$)
			Autonomy $\beta = .08^*$ ($\beta = .06^\wedge$)

Predictor in Fall	Changes from Fall to Spring in:		
	Overall Catastrophizing Appraisals	Catastrophizing of Relatedness	Catastrophizing of Competence
Motivational Resilience	$\beta = -.10^*$ ($\beta = -.05^{ns}$)	$\beta = -.14^{***}$ ($\beta = -.10^{***}$)	$\beta = -.13^{**}$ ($\beta = -.06^*$)
			Catastrophizing of Autonomy $\beta = -.21^{***}$ ($\beta = -.12^{***}$)

Predictor in Fall	Changes from Fall to Spring in:		
	Overall Interpersonal Resources	Warmth	Structure
Motivational Resilience	$\beta = .11^{**}$ ($\beta = .09^*$)	$\beta = .12^{***}$ ($\beta = .11^{**}$)	$\beta = .13^{***}$ ($\beta = .13^{***}$)
			Autonomy Support $\beta = .16^{***}$ ($\beta = .16^{***}$)

Note. $N = 1020$ students in grades three through six. Correlations in parentheses are for the motivational resilience Construct sans emotional reactivity. *** $p < .001$. ** $p < .01$. * $p < .01$. $^\wedge p < .10$. ns = not significant.

Gender and grade differences in feedforward or feedback effects. Of the 24 feedforward interaction analyses examined, only two were found to be significant: The effects of *structure* on changes in students' motivational resilience were moderated by student grade, such that teacher provision of structure was more important for 4th graders ($\beta = .15, p < .01$) than for either 3rd graders ($\beta = .03, ns$) or 6th graders ($\beta = .02, ns$). Additionally, *relatedness* appeared to be slightly more important to 4th graders' motivational resilience ($\beta = .15, p < .01$) than it was for students who were in 6th grade ($\beta = .04, ns$). Likewise, of the 24 feedback interaction analyses examined, only two were significant: The effects of students' motivational resilience on *changes* in their overall catastrophizing and catastrophizing of relatedness were moderated by student gender. Specifically, motivational resilience predicted decreased overall catastrophizing and catastrophizing of relatedness for boys ($\beta = -.16, p < .01$ and $\beta = -.20, p < .001$, respectively) but not for girls ($\beta = .003, ns$ and $\beta = .06, ns$). No other grade or gender interactions were found in this sample.

Effects of Teacher Support on At-risk Motivational Systems

In order to examine the effects of teacher support on students' established motivational systems, we compared the subset of students who began the school year with existing motivational risk factors (i.e., who reported high – that is, above median – levels of catastrophizing appraisals in fall) with those who were less motivationally at risk (i.e., who reported low – below median – levels of catastrophizing), to see whether changes in students' motivational resilience over the school year differed as a function

of the level of teacher support they received. Specifically, for students who were motivationally at-risk at the beginning of the year, we looked to see whether those who received consistently high or increasing levels of teacher support (i.e., who had supportive teachers) would be able to recover their motivational resilience, whereas those who received low or decreasing levels of support (i.e., who had unsupportive teachers) would stay caught in the negative motivational space. Conversely, for students who began the school year without such motivational vulnerability, we examined whether those with unsupportive teachers would become increasingly more vulnerable, while those with supportive teachers would maintain their motivational resilience. Ultimately, we wondered if teacher support could intervene in these self-amplifying systems to help pull students out of detrimental feedback loops.

As can be seen in Figure 3.2, students who began the year motivationally at-risk (i.e., high in catastrophizing) reported significantly lower levels of motivational resilience than their less vulnerable peers in fall, $t(1018) = 15.01, p < .001$. Repeated measures analyses of variance (ANOVAs) showed significant interaction effects between level of teacher support (supportive vs. unsupportive) and time point (fall vs. spring) for each vulnerability group, ($F(1, 523) = 49.29, p < .001$ for the low catastrophizing group, and $F(1, 493) = 54.26, p < .001$ for the high catastrophizing group), indicating that changes in students' motivational resilience across time depended on which type of teacher support was experienced. Specifically, for the high risk (i.e., high catastrophizing) students ($n = 495$), those with supportive teachers

increased in motivational resilience from fall to spring (paired $t(163) = 7.83, p < .001$), whereas those who reported unsupportive teachers remained low in motivational resilience (paired $t(330) = 1.71, ns$). For the low risk (i.e., low catastrophizing) students ($n = 525$), also consistent with expectations, those with supportive teachers stayed high in motivational resilience across the school year (paired $t(345) = .82, ns$), whereas those who reported unsupportive teachers decreased from fall to spring (paired $t(178) = 8.09, p < .001$). Moreover, by the end of the school year, students who reported high catastrophizing appraisals in fall but received consistently high or increasing levels of teacher support from fall to spring actually reported significantly higher levels of motivational resilience than their classmates who began the school year with few risk factors but received consistently low or decreasing levels of teacher support, $t(341) = 2.76, p < .01$.

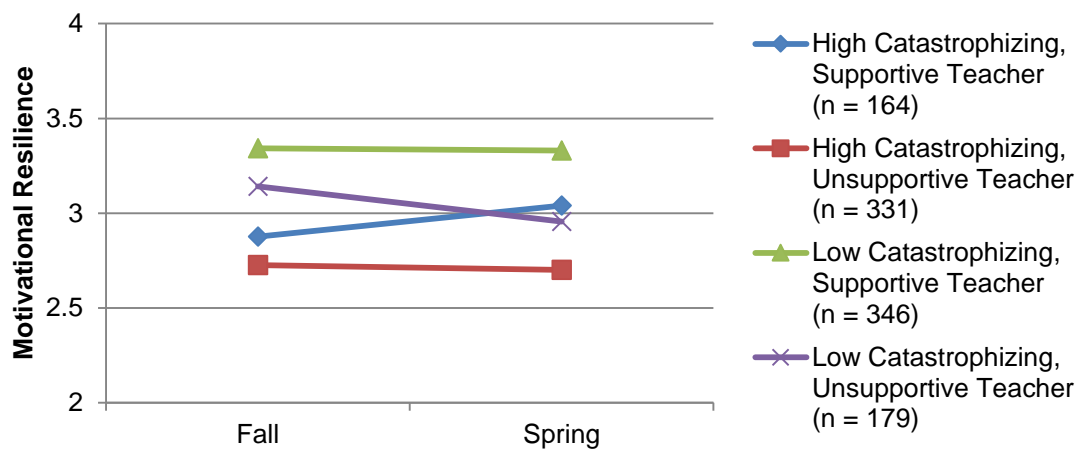


Figure 3.2. Mean levels of students' motivational resilience across the school year according to initial vulnerability status and level of teacher support over the school year.

Responses could range from (1) Not at all true for me to (4) Very true for me.

Discussion

Consistent with extant research examining the proposed motivational model (e.g., Connell & Wellborn, 1991; Klem & Connell, 2004; Skinner et al., 2008), the findings of this study document the dynamic relationships that exist among students' motivational resilience and their social contexts, personal resources, and achievement outcomes. This study found the typical feedforward effects from students' self-system processes (i.e., personal resources) and also documented strong effects of teacher support (i.e., interpersonal resources) on changes in their motivational resilience. Students' motivational resilience, in turn, predicted changes in their academic achievement over the school year. Perhaps surprisingly, feedback effects were also found for each link in the proposed model. Students who evinced high motivational resilience in fall showed small improvements in their achievement as the year progressed along with increasing feelings of relatedness, autonomy, and especially competence, and decreases in the associated catastrophizing appraisals, particularly of autonomy. They also reported experiencing increases in warmth, structure, and especially autonomy support from their teachers. In contrast, students who began the year with greater motivational vulnerabilities were likely to show small declines in their achievement from fall to spring accompanied by decreases in their positive self-perceptions and increases in catastrophizing. They also experienced their teachers as withdrawing from them and becoming more controlling over time.

Together, these feedforward and feedback effects may form dynamic, potentially

self-perpetuating cycles, such that students who start the school year high in personal and interpersonal resources are likely to exhibit higher levels of motivational resilience, which in turn elicits increases in those resources. In contrast, students who are initially low in motivational resilience tend to experience erosion of their existing resources over time, which has ever increasing deleterious effects. Taken together with evidence that the internal dynamics of motivational resilience are also self-sustaining, it seems that, without outside intervention, these virtuous and vicious feedback cycles are likely to persist, in the classic “rich get richer, poor get poorer” dynamic.

However, a key interest of this study was to examine whether teacher support can reshape these otherwise self-reinforcing motivational systems. Comparisons of students with motivationally vulnerable profiles (as marked by high levels of catastrophizing appraisals) with their less vulnerable peers demonstrated that students who began the school year high in catastrophizing appraisals but received high levels of teacher support were able to bounce back such that they ended the year with higher levels of motivational resilience than even students who began with less risky profiles but received low levels of teacher support.

With few exceptions, all of these effects were consistent across grade and gender, for both types of motivational resilience composite scores. All but a few of the hypothesized feedforward and feedback effects were operating as predicted, regardless of which type of motivational resilience score was utilized. The only exceptions involved emotional reactivity. First, it did not show the predicted negative correlations

with academic achievement, indicating that emotional reactivity did not necessarily interfere with achievement and that even high achieving students can become upset when they encounter failures and setbacks. Second, interpersonal resources did not predict declines in emotional reactivity – high teacher support did not protect students from becoming upset. And third, students’ perceptions of relatedness were predictive of changes in their motivational resilience across the school year when the composite included emotional reactivity, but not when it was excluded. We also looked for grade and gender interaction effects, of which four were significant, but did not seem to be very substantively important: The effects for structure were more important for 4th graders than for 3rd or 6th graders, and the effects for relatedness were more important for 4th than for 6th graders. As for gender interactions, the effects for catastrophizing of relatedness (and, by extension, overall catastrophizing) were slightly more pronounced for boys than for girls.

Study Strengths and Limitations

Of course, these findings must be interpreted in light of the study’s strengths and limitations. Although it is a significant strength of this study that it is embedded in the larger SDT framework, the conceptualization does not encompass all the constructs that potentially are relevant to motivational resilience. For example, students’ goal orientations and mindsets (Dweck, 2006) likely play key roles in how they appraise and respond to challenges and setbacks in school, as would their self-regulatory strategies (Schunk & Zimmerman, 2012) and other factors important to academic buoyancy, such

as high levels of planning or support from parents and the community (Martin & Marsh, 2008).

In terms of measures, all of the information in the current study was acquired via surveys, relying on students' own self-reports of their experiences. Although students' perspectives are crucial to access internal processes, many constructs are also observable in the classroom, and future studies would benefit from the inclusion of observational methods and other reporters' perspectives on student engagement and teacher-student interactions. Moreover, in terms of design, it will be important in future studies to examine how motivational resilience and its reciprocal relationships with students' personal and interpersonal resources operate over longer periods, potentially accumulating in their effects as self-amplifying cycles play out over time. Experimental designs will also be essential to assess issues of causality more directly.

In terms of sampling, having the participation of an entire school district is a significant strength of this study. However, the district consisted of predominantly working-class, Caucasian families. The age of the data is notable, as technological innovations such as the integration of the Internet or iPads into classroom environments and educational policies like No Child Left Behind have had an appreciable impact on educational systems' priorities in recent years. According to SDT, these should be universal motivational principles (Deci & Ryan, 1985), and thus much can still be learned from this sample; but, it will be necessary to replicate this study on more recent and diverse samples in order to assess their generalizability over time and populations.

Implications and Future Research

This study adds to a growing understanding of how the dynamics of motivational resilience function. Previous research provided initial evidence suggesting that students' ongoing engagement fuels their reactions to challenges: Students who are enthusiastic and actively involved in academic tasks tend to use adaptive coping strategies to bounce back from difficulties, contributing to a virtuous feedback loop that sustains engagement. In contrast, students who begin the school year relatively more disaffected show increasing emotional reactivity, maladaptive coping, and eventually, giving up, which together form a detrimental self-reinforcing cycle that can be difficult to escape (Skinner et al., 2015). Building on this earlier work, the current study focuses on how these internal dynamics can be influenced by *external* contributors such as students' own self-system processes and supports from their classroom teachers. Taken together, these studies provide evidence for almost all of the links in the proposed model (see Figure 1); and although findings suggest that neither students' engagement nor their close relationships with teachers protect them from emotional reactivity (Skinner et al., 2015), results from the current study reveal that internal dynamics, which are otherwise self-amplifying, can be reduced, and in some cases reversed, by factors external to this system.

Emotional reactivity. In early iterations of the model of motivational resilience, we assumed that high levels of emotional reactivity signaled a motivational vulnerability, and would interfere with students' capacities to cope adaptively and

bounce back after failure. However, research suggests that the role of emotional reactivity is more complex than expected. Based on students' reports of how upset they become following setbacks in school, we discovered that students who were disaffected from and doing poorly in school could indeed be highly emotionally reactive, but so too could students who were highly engaged and doing well. Likewise, students who reported close relationships with their teachers were just as likely to report being upset by difficulties as students who reported less supportive relationships. And, although emotional reactivity did not prevent students from re-engaging with challenging academic tasks, it did make them more likely to give up. Thus, emotional reactivity, at least as measured in this study, seems to contain not only elements of risk, but also elements of how much students care: If things are going well, emotional reactivity seems to be a marker for commitment or investment, but if things are going poorly it can exacerbate ongoing negative cycles and undermine students' motivational resources.

Because it provides observable information to teachers, emotional reactivity is a particularly important target for future study. Structurally, at any moment, snapshot correlations show that students who are engaged tend to be less emotionally reactive, students who are highly reactive tend to cope more maladaptively, and so on. All of the concurrent links hypothesized by the motivational model (with the exception of the connection to achievement), although not always strong, were found in this study. However, in terms of determining how emotional reactivity *functions* over time, more

empirical work is needed. Future studies should probably continue to utilize composite motivational resilience scores that include emotional reactivity, but, particularly when examining change over time, it would be instructive to compare the functioning of motivational resilience using such scores to markers that exclude reactivity.

Most importantly, future investigations may benefit from the use of person-centered analysis to identify different profiles of motivational resilience, distinguishing students who are high versus low on emotional reactivity and on the other components of resilience (engagement, coping, and re-engagement) in order to better elucidate how these features function in combination. Ideally, students would be motivationally resilient and exhibit low levels of emotional reactivity, bouncing back from setbacks without being derailed by their emotions, and instead just busily learning from each experience. Indeed, such students may display very different patterns of functioning than students who are generally motivationally resilient but also highly reactive. In the same vein, students who are low in motivational resilience but who nevertheless get very upset when they run into difficulties may at least still show the “spark” of caring about their academic work, and so their enthusiasm may be more easily re-ignited with well-calibrated support. The toughest combination to rekindle may be a profile that is low on motivational resilience *and* low in emotional reactivity, perhaps manifest as apathy or amotivation, which is particularly detrimental (Ratelle, Guay, Vallerand, Larose, & Senécal, 2007). Future studies could also examine profiles that incorporate students’ achievement – emotional reactivity may play a different role in motivational

resilience for students with consistently high achievement compared to those with persistent academic difficulties.

It is also possible that, compared to emotional reactivity, a more important element to incorporate into the model of motivational resilience would be *recovery* from emotional distress. It seems plausible that it may not be whether (or how far) students fall emotionally, but rather how quickly they recover or bounce back that truly matters to their motivational resilience. To more thoroughly investigate this idea, future studies would benefit from the inclusion of a measure of emotional bounceback, or what Davidson (1998) refers to as *affective chronometry*.

Reciprocal effects. In research on coping and resilience, examination of feedforward effects is standard practice. Researchers typically attempt to determine the kinds of supports from students' school or family contexts that encourage them to try hard, cope well, and bounce back. However, the findings from this study underscore the importance of looking for *both* feedforward *and* feedback effects: Both directions of effects were evident for every link in the proposed model. It seems that when students perform well in school, this learning and success naturally feed back into their motivational resilience. In the same vein, motivational resilience contributes to their personal resources and even influences the availability of their interpersonal resources. To more thoroughly elucidate the functioning of such complex dynamics over time, future studies would benefit from designs that allow researchers to measure these constructs on time scales more closely aligned with the actual timing of how these

reciprocal loops likely play out and stabilize (i.e., across days or weeks, or even moment by moment, rather than months).

Importance of teacher support. Findings from the current study underscore the crucial role played by teachers in the dynamics of students' motivational resilience. For students who are already doing well, the self-reinforcing feedback loop seen within the internal dynamics of motivational resilience is beneficial, but that same cyclical dynamic can also prevent students from escaping an existing adverse feedback loop organized around motivational vulnerability. Importantly, however, these typically self-sustaining dynamics should not be taken as a message that the system is fixed or impervious to intervention. In fact, the present study demonstrates that this system is indeed open to influence – the compensatory part comes, potentially, through well-calibrated teacher support. Next steps for examining this process may include studies that are more longitudinal in nature, where researchers could observe students as they encounter new teachers across different school years and note the extent to which motivational resilience is either preserved or undermined by the kinds of support they subsequently receive.

Certainly, supporting students' motivational resilience is not an easy task. Without mindful intention to positively intervene in these processes, it is all too easy for teachers to participate in ways that just sustain or amplify existing negative motivational dynamics. It is understandable that the default for teachers is to reciprocate – providing more support for motivated students while at the same time withdrawing their support

and increasing pressure on students who are actively disaffected in class, emotionally reactive, cope maladaptively, or give up in the face of challenges. After all, teachers too have needs to feel related, competent, and autonomous, and dealing with demands such as student disruption, emotional outbursts, or helpless behaviors can directly undermine each of these needs (Furrer et al., 2014). However, the knowledge that these vulnerabilities will otherwise multiply over time can motivate the urgency of early intervention efforts.

Teachers will themselves need support if they are to participate in these dynamics in ways that counteract vulnerability and sustain resilience. Educators may need training to be able to simultaneously monitor all the components of the complex motivational system, vigilantly watching for multiple indicators of vulnerability and attempting to provide students with appropriately well-tuned support. It is essential for schools and administrators to recognize the important role students' social contexts play both in bringing students out of vulnerability and in helping those who are already doing well to maintain their momentum. Facilitating teachers' capacities to provide students with optimally calibrated support can have powerful effects on students' motivational systems. The present study demonstrated that teachers can indeed provide compensatory dynamics within this motivational system, which encouragingly, once recalibrated, can become fueled by its own self-sustaining nature. Teachers are in a unique position to intentionally intervene in this process, and their support has the capacity to have a lasting impact on students' profiles of motivational resilience.

Chapter 4

Engagement and Teacher Support as Resources for Academic Coping and Re-engagement: Maintaining Momentum Across the Transition to Middle School

The transition from elementary to middle school is often a stressful time for students, given their experiences of concurrent changes in themselves (i.e., puberty) coupled with significant changes in their environments. As students move from one educational context to the next, mismatch between students' current developmental needs and the new context (e.g., differences in classroom structure, teaching styles, or expectations) can result in motivational declines (Eccles & Midgley, 1989; Eccles et al., 1993; Eccles & Roeser, 2009). Middle schools are typically larger, more competitive, and more academically demanding than elementary schools, often with an increasing focus on performance (vs. mastery) goals (Anderman & Midgley, 1997; Anderman & Mueller, 2010). At the same time, having multiple teachers each day allows less opportunity to build quality relationships (Simmons & Blyth, 1987), and students' friendship networks can be disrupted by the move to a new school (Hardy, Bukowski, & Sippola, 2002; Juvonen, 2007).

In recent years, evidence of normative declines in student outcomes, such as achievement, academic adjustment, and achievement motivation, as students make their way across this transition has continued to accumulate (Akos, Rose, & Orthner, 2015; Anderman & Mueller, 2010; Ryan, Shim, & Makara, 2013; Zanobini & Usai, 2002). However, not all students experience detrimental effects during this time; individual

differences in personal and social resources may help explain the facility with which some students make this transition. To the extent that students' schools and classrooms provide supports that are congruent with their changing needs (e.g., for increased autonomy and continued closeness with teachers and peers), the negative impacts of the middle school transition can be mitigated.

Although studies have identified numerous self-perceptions and character strengths that seem to make a difference to how this transition is accomplished (Harter, Whitesell, & Kowalski, 1992; Lord, Eccles, & McCarthy, 1994; Shoshani & Slone, 2013), less research has focused on what resources students have access to as they approach this transition and what they actually *do* in response to stressors. Have they had adequate levels of teacher support to help them acquire the coping skills they'll need? Do they have enough ongoing engagement to maintain momentum across the transition? Do they have an established repertoire of coping strategies to turn to as new difficult scenarios are encountered?

With these issues in mind, this study focuses on the resources students accumulate as they approach the transition to middle school that may serve them in dealing effectively with the new challenges they face. Using structural equation modeling (SEM) within an established model of *motivational resilience* (see Figure 4.1), we explored relationships among students' social and motivational resources and their academic achievement as they navigate this transition. Specifically, we examined whether student engagement and teacher support prepare students to cope successfully

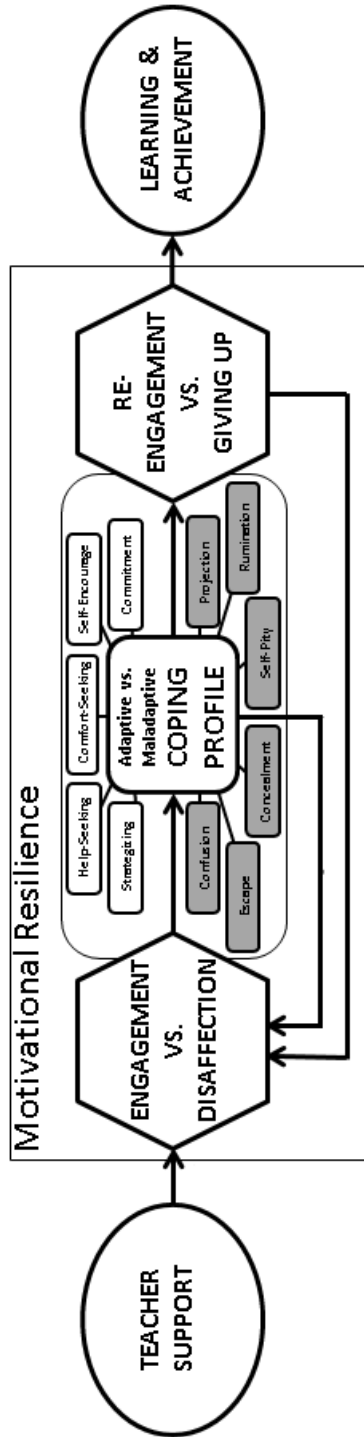


Figure 4.1. Conceptual model of motivational resilience and its antecedents and consequences examined in this study.

and to re-engage following encounters with setbacks, therefore allowing students to maintain their engagement across the middle school transition and subsequently succeed academically. Moreover, we examined differences in motivational outcomes across the transition for students who had accrued high levels of resources (i.e., teacher support and adaptive coping profiles) compared to those who had particularly low levels of support and/ or less adaptive coping strategies.

Engagement as an Academic Asset

Engagement is well established as an important driver of students' academic success (Christenson, Reschly, & Wylie, 2012; Fredricks, Blumenfeld, & Paris, 2004). Students' active, sustained, enthusiastic involvement in learning activities not only leads to higher levels of academic performance, persistence, retention, and graduation (Jang Kim, & Reeve, 2012; Klem & Connell, 2004; Ladd & Dinella, 2009; Reyes, Brackett, Rivers, White, & Salovey, 2012), but also protects students from harmful outcomes such as school dropout and gang involvement (Archambault, Janosz, Morizot, & Pagani, 2009; Li & Lerner, 2011; Wang & Fredricks, 2014). In contrast, when students are *disaffected*, that is, bored, apathetic, passive, disruptive, or otherwise disconnected from the learning process, they are more vulnerable to these risky behaviors and suboptimal school outcomes (Finn & Rock, 1997; Henry, Knight, & Thornberry, 2012). Engagement has gained particular currency in recent years due to its malleability, which makes it a compelling candidate for interventions seeking to improve student outcomes and a natural focus for efforts to influence student learning (Appleton, Christenson,

Kim, & Reschly, 2006; Fredricks et al., 2004; Jimerson, Campos, & Greif, 2003; Wang & Holcombe, 2010).

Process Model of Motivational Resilience

Engagement is an essential component of student success, but it is not sufficient to protect students from the inevitable challenges and struggles they will face. It is also crucial to consider whether and how students return to a state of engagement after encounters with problems and setbacks (Boekaerts, 2002; Martin & Marsh, 2009). How ongoing engagement is related to processes of coping and re-engagement has been the focus of recent studies of *motivational resilience* (Reschly, Huebner, Appleton, & Antaramian, 2008; Skinner et al., 2015).

Coping. Academic coping refers to how students actually deal with particular stressful events (Skinner & Zimmer-Gembeck, 2007). Adaptive coping strategies (such as trying to figure out what went wrong, getting help from the teacher, or seeking comfort from others) provide a route back to learning, whereas maladaptive strategies (such as withdrawal, rumination, or blaming others) can divert students from the path to persistence. Together, these individual ways of coping form a profile of possible responses when students encounter obstacles and setbacks in school. Importantly, it is extremely valuable to have a variety of strategies on hand to choose from as challenges are encountered. This repertoire will not all be used at once, but having a *coping profile* that includes a number of potential strategies allows flexibility to choose the most effective strategy for a specific situation, as well as provides (sometimes multiple) back-

up strategies if initial attempts are not successful (Cheng, Lao, & Chan, 2014).

Evidence suggests that the utilization of adaptive ways of coping (i.e., strategizing, comfort-seeking, help-seeking, self-encouragement, commitment, or negotiation) results in more positive outcomes, both in academic settings and in life more generally (Frydenberg & Lewis, 1999). For example, students who utilized positive, action-oriented strategies such as finding out what they did wrong or asking for help showed higher levels of academic achievement, perceived competence, and self-concept (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Mantzicopoulos, 1990, 1997; Marchand & Skinner, 2007). In contrast, students who used maladaptive coping strategies (i.e., confusion, escape, concealment, self-pity, rumination, or projection) experienced more negative outcomes. For example, utilization of strategies such as withdrawing from social partners, concealment, or rumination was associated with less positive adjustment outcomes such as increases in internalizing and externalizing symptoms (Compas, Malcarne, & Fondacaro, 1988; Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000) and decreases in engagement over the school year (Marchand & Skinner, 2007). Moreover, Lewis and Frydenberg (2002) suggest that students' ineffective coping triggers additional coping of all kinds – both adaptive and maladaptive – and that an over-reliance on maladaptive strategies can inhibit their ability to use the adaptive strategies effectively. This is critical because the extent to which students deploy adaptive rather than maladaptive strategies shapes whether students can recover successfully from difficult experiences

and emerge ready and willing to learn.

Re-engagement vs. giving up. All students will encounter stressors and problems in school; re-engagement is the process that leads them to try again rather than to give up when those challenges are encountered. Similar work in the areas of academic buoyancy (Martin & Marsh, 2008; 2009), productive persistence (Yeager, 2011), and grit (Duckworth, Peterson, Matthews, & Kelly, 2007) links students' re-engagement with positive scholastic and motivational outcomes, including the return to a state of ongoing engagement. Importantly, the ability to bounce back following setbacks has been shown to be important in its own right, over and above the effects of academic coping (Putwain, Connors, Symes, & Douglas-Osborn, 2012).

Supporting Coping and Re-engagement

It is important to consider what students bring with them to their new educational contexts that prepares them to respond to stressors in ways that allow them to maintain their engagement in the face of the new and varied challenges encountered in middle school (i.e., to cope adaptively and re-engage rather than give up). Students may have access to a number of resources, both within themselves and from their social context.

Teacher support. As students' most influential interaction partners in the classroom, teachers are important in preparing students for the transition because they can both directly affect students' engagement and also support their use of adaptive coping strategies (Klem & Connell, 2004). From a self-determination theory

perspective (SDT; Deci & Ryan, 1985; Skinner, Kindermann, Connell, & Wellborn, 2009), three components of relationships are especially important to students' motivation, each in support of one of the three fundamental needs put forth by SDT, *relatedness*, *competence*, and *autonomy*.

Warmth (vs. rejection) supports students' needs for relatedness. Students feel like a welcomed and valued part of their classrooms when teachers treat them with affection and care (Wentzel, 2009). *Structure* (vs. chaos) supports students' needs for competence. Providing clear expectations, consistent and predictable classroom experiences, and reasonable limits bolsters students' understanding of themselves as having what it takes to succeed in school (Skinner, Zimmer-Gembeck, & Connell, 1998). Finally, *autonomy support* (vs. coercion) supports students' needs for autonomy. Providing students with choices and explanations of why learning objectives are personally relevant to them allows students to internalize the value of learning activities and take more ownership over their educational journey (Reeve, 2009; Reeve & Jang, 2006; Stefanou, Perencevich, DiCintio, & Turner, 2004). Each of these types of teacher support have been shown to be strong predictors of students' engagement, coping, and persistence (e.g., Hughes & Kwok, 2007; Hughes, Wu, Kwok, Villarreal, & Johnson, 2012; Klem & Connell, 2004; Niemiec & Ryan, 2009; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Reyes et al., 2012).

Engagement as an energetic resource. In addition to its other well-established benefits, students' ongoing engagement may also provide energy for their coping in the

face of challenging experiences in school, and so may represent an important resource during stressful times. For example, engagement predicts increases in students' autonomous motivation (Reeve & Lee, 2014) and adaptive coping (Skinner et al., 2015) across the school year. However, research consistently demonstrates steady declines in students' motivation and engagement as they progress through school, particularly at times of school transition (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006; Woolley & Bowen, 2007), making students' levels of engagement as they approach the end of elementary school of particular interest as a potential marker at the crossroads of students' educational pathways.

The Current Study

Using a theory of motivational resilience as a framework (Skinner et al., 2013, 2015), this study examined whether students' motivational resources in fifth grade can help them successfully navigate the transition to middle school. In fall and spring of students' fifth- and sixth-grade years, information was gathered from students, teachers, and school records, measuring students' perceptions of teacher support, ongoing classroom engagement, academic coping, re-engagement after encounters with difficulty, and school achievement (i.e., grades). We wanted to examine whether students' resources at the end of elementary school would make a difference to how successfully they navigate the transition. Specifically, we wondered: Do engagement and teacher support prepare students to cope successfully and to re-engage following encounters with challenges and setbacks, allowing them to maintain their engagement

across the middle school transition and thus succeed academically? And, do students who receive high levels of teacher support and develop particularly good coping repertoires in fifth grade have a motivational advantage (as compared to students who report low levels of teacher support and/or more maladaptive coping profiles) as they move across the transition to middle school?

Research Design and Method

Sample

Data from an existing longitudinal project were utilized. As part of a large, district-wide evaluation of a rural-suburban school district, elementary and middle school students completed surveys about their engagement and coping in school, and their teachers completed questionnaires about each student. The study used a cohort-sequential design, with data collected in fall (October) and spring (May) for four consecutive years. For a complete description of the larger study, see Skinner et al. (1998).

A subset of these students ($n=281$) were utilized for this study. Participants were students from years two through four of the project who had data available for both fifth and sixth grades (146 boys and 135 girls, ages 10-12). The majority of these students identified themselves as Caucasian, with less than 5% identifying as non-white, and their families' socioeconomic status (determined by their parents' occupations and levels of education) ranged from working to middle class.

Measures

At each time point, students completed questionnaires in their classrooms during three 40-minute class sessions. Trained research assistants read questions aloud to students and were available to answer questions. Students responded to each item using a 4-point Likert scale, ranging from Not at all true for me (1), Not very true for me (2), Sort of true for me (3), or Very true for me (4). Teachers also completed questionnaires about each individual student, indicating whether each item was Not at all true for this student (1), Not very true for this student (2), Sort of true for this student (3), or Very true for this student (4). Composite scores were calculated by averaging the items for each scale, with negative items reverse-coded. Scores could range from 1 to 4, with higher scores indicating more of the respective construct.

Teacher support in fall of fifth grade. Students responded to measures tapping their experiences of support from their classroom teachers along three dimensions (Skinner & Belmont, 1993): (1) *warmth versus rejection*, measured via 16 items tapping whether teachers spent time with students, showed them affection, and were available, knowledgeable, and dependable (e.g., “My teacher is always there for me”); (2) *structure versus chaos*, captured by 29 items tapping whether teachers offered clear expectations, contingent responses, help and support, and attuned teaching strategies (e.g., “Every time I do something wrong, my teacher acts differently,” reverse coded); and (3) *autonomy support versus coercion*, assessed using 21 items tapping the extent to which teachers provided students with choices, exerted control over them, offered

respect for their ideas and opinions, and explained the relevance of learning activities (e.g., "My teacher gives me a lot of choices about how I do my schoolwork"). Items were averaged to form a summary score, with negatively worded items reverse-coded.

Student engagement vs. disaffection in fall of fifth and fall of sixth grade.

Students' ongoing engagement versus disaffection in the classroom was measured via two sets of items tapping their participation in (or withdrawal from) classroom learning activities (Skinner, Kindermann, & Furrer, 2009). Students responded to items designed to tap their own engagement vs. disaffection, including 11 items that measured behavioral and emotional engagement (e.g., "I try very hard in school"), and 14 items that tapped behavioral and emotional disaffection (e.g., "In class, I try to do just enough to get by). *Teachers* also gave information about each student's engagement and disaffection, using five items that captured students' behavioral and emotional engagement (e.g., "In my class, this student works as hard as he/she can") and 8 items that tapped students' behavioral and emotional disaffection (e.g., "When I explain new material, this student seems bored"). Items were averaged into a summary score, with disaffection items reverse coded. The correlations between student and teacher reports were .34 and .33, $p < .001$, for engagement vs. disaffection in Fall of 5th grade and fall of 6th grade, respectively, indicating that there was moderate overlap between reporters, but that each reporter provided unique information from his or her perspective.

Ways of coping in spring of fifth grade. Students responded to items measuring their coping with academic problems. Subscales consisting of five items

each were used to tap 11 ways of coping with academic problems (Skinner et al., 2013). Each subscale prompted students to report about how they respond to stressful events in school, with items randomly mixed and using one of four different item stems (e.g., “When I have difficulty learning something...”). Five of the subscales tapped adaptive ways of coping, including (1) Strategizing (e.g., “I try to figure out how to do better next time”), (2) Help-seeking (e.g., “I ask the teacher to explain what I didn’t understand”), (3) Comfort-seeking (e.g., “I talk about it with someone who will make me feel better”), (4) Self-encouragement (e.g., “I tell myself it’s not so bad to make a mistake”), and (5) Commitment (e.g., “I think about all the reasons it’s important to me”); and six of the subscales tapped maladaptive ways: (1) Confusion (e.g., “My mind goes blank”), (2) Escape (e.g., “I say I didn’t care about it”), (3) Concealment (e.g., “I make sure nobody finds out”), (4) Self-pity (e.g., “I can’t believe this is always happening to me”), (5) Rumination (e.g., “I just can’t stop thinking about it”), and (6) Projection (e.g., “I say the teacher isn’t fair”). *Coping Profile* scores were computed by averaging the adaptive and maladaptive coping scores (with maladaptive scores reverse coded) to indicate the balance of overall adaptive coping relative to maladaptive coping.

Re-engagement vs. giving up in spring of fifth grade. Students’ reactions to encounters with challenges and setbacks in school were recorded via two sets of measures (Skinner et al., 2013). Students responded to nine items, four tapping re-engagement (i.e., persistence; “If a problem is really hard, I keep working at it.”), and five tapping giving up (e.g., “If a problem is really hard, I just quit working on it”).

Teachers also responded to items about each student's propensities toward persisting versus giving up; one item tapped students' re-engagement following academic setbacks ("When this student doesn't do well on a test or assignment in my class, s/he works harder next time"), and two items that measured giving up (e.g., "When faced with a difficult problem or assignment in my class, this student gives up quickly"). Student- and teacher-reports were moderately correlated ($r = .37, p < .001$), indicating that there was significant overlap between reporters but also that each reporter offered unique information from his or her perspective. Items were averaged to form a summary score, with giving up items reverse coded.

Academic performance in spring of sixth grade. Performance data were obtained from school records and included students' report card grades for core classes (i.e., reading, language arts, spelling, and math). Scores were converted from letter grades to numbers ranging from 1 (F or U-) to 12 (A or V), and a composite score was calculated by averaging students' grades across subjects.

Results

Descriptive Analyses

Measurement properties and descriptive statistics. Means, standard deviations, and internal consistency coefficients for each variable included in the study are reported in Table 4.1. Internal consistency reliabilities were satisfactory for all variables. Examination of mean levels suggests that students were generally well-functioning, demonstrating relatively high levels of engagement and teacher support at

the beginning of fifth grade and high levels of re-engagement and coping at the end of fifth grade. Engagement, although it had decreased significantly as is typical across the middle school transition ($t(280) = -7.59, p < .001$), was still moderately high as students entered sixth grade. Achievement was moderate, with the mean grade being the equivalent of about a B-.

Intra-construct correlations. Correlations among all variables included in the study are presented in Table 4.1. Constructs were intercorrelated as expected: Engagement was positively correlated with teacher support, re-engagement, coping profiles, and achievement, and teacher support was positively correlated with re-engagement, coping, and achievement. Students' coping profiles at the end of 5th grade were not correlated with their achievement at the end of 6th grade, which was not surprising given that the effects of coping on achievement were predicted to be mediated through students' subsequent re-engagement and engagement. It should be noted that multicollinearity and the high cross-time stability for engagement may make it more difficult to detect change over time.

Table 4.1

Means, Standard Deviations, and Intercorrelations Among All Study Variables

Variable	1	2	3	4	5	6
1. Engagement (Fall 5 th)	1.00					
2. Teacher Support (Fall 5 th)	.62	1.00				
3. Re-engagement (Spring 5 th)	.40	.36	1.00			
4. Coping Profile (Spring 5 th)	.66	.56	.47	1.00		
5. Engagement (Fall 6 th)	.52	.44	.48	.39	1.00	
6. Achievement (Spring 6 th)	.32	.26**	.30	.15 ^{ns}	.41	1.00
Mean	3.24	3.14	3.29	3.12	3.07	8.23
Standard Deviation	.50	.54	.49	.57	.49	1.88
Internal Consistency (α)	.88	.93	.71	--	.90	--

Note. $n = 281$ students. All coefficients are significant at $p < .001$ except as noted. ** $p < .01$. ^{ns} means not significant.

Structural Model Examining Relations Between Motivational Resources, Coping and Re-engagement, and Academic Achievement

Structural equation modeling (SEM) was used to examine the predicted relationships among students' motivational resources early in fifth grade, their coping and re-engagement right before the transition, and their engagement and academic achievement after the transition was completed. Students' ongoing engagement and teacher support at the beginning of 5th grade were predicted to influence their re-engagement via coping by the end of the year, which would in turn predict their engagement and subsequent achievement in 6th grade. All models were run using AMOS version 22.0 (Arbuckle, 2013), and missing data were handled using full

information maximum likelihood (FIML). Student gender was included as a control variable by specifying paths to each of the model constructs; none of these paths were significant.

Figure 4.2 presents standardized path coefficients for the structural model. All predicted paths were significant at $p < .01$ with the exception of the path predicting engagement in Fall of 6th grade from students' coping profile at the end of 5th grade, which approached significance in the predicted direction ($p = .06$). The overall fit of the model to the data was good, $\chi^2(6) = 7.39$, $p = .29$; CFI = .996; RMSEA = .03 (Hu & Bentler, 1999; Kline 2011). This section will first describe the direct paths within the model, followed by an examination of coping's role as a mediator within the proposed model.

Direct paths. As can be seen in Figure 4.2, students' engagement and perceptions of teacher support at the beginning of fifth grade were positively associated with their coping profile at the end of the school year ($\beta = .44$ and $.33$, respectively), such that students who were more highly engaged and reported higher levels of teacher support evinced higher levels of adaptive coping profiles in spring of fifth grade. Students' coping profiles at the end of fifth grade predicted both their concurrent re-engagement ($\beta = .63$) and, to a degree, their subsequent engagement after the school transition ($\beta = .17$, $p = .06$). Finally, re-engagement in spring of fifth grade was positively associated with engagement following the transition to middle school ($\beta = .29$), which was a strong predictor of achievement at the end of sixth grade ($\beta = .40$).

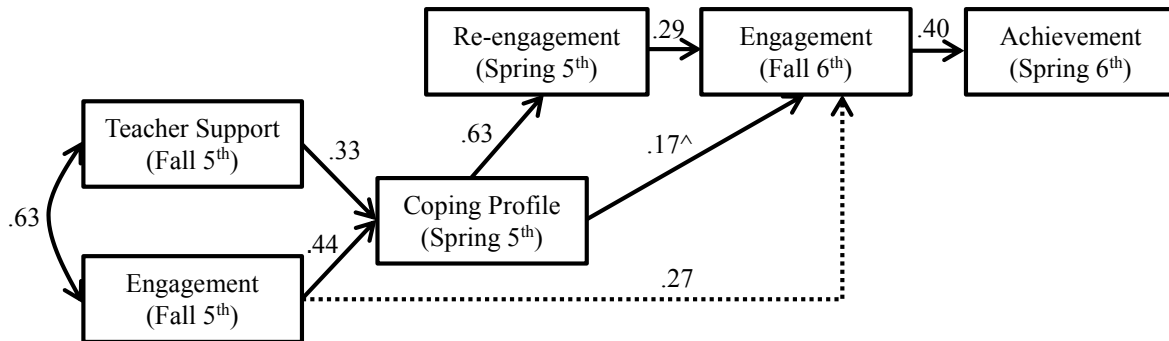


Figure 4.2. Standardized coefficients for structural model of students' coping and re-engagement mediating the relationships between their motivational resources and academic achievement across the middle school transition ($n = 281$). To enhance clarity, coefficients for the statistical control (gender) and within-wave correlation among the two error terms in Spring of 5th grade are not depicted.

Coping as mediator. Students' coping profiles were predicted to play a key role as a mediator within the proposed model of motivational resilience. As predicted, students' coping was an essential intervening step in the pathways between their ongoing engagement and teacher support received in fall of fifth grade and their subsequent re-engagement and engagement. Tests of these indirect effects (Sobel, 1982) revealed that coping was central to the process of students' motivational resilience across the middle school transition, partially mediating the relationships between: (a) students' engagement in fall of fifth grade and their re-engagement at the end of the year ($z = 4.56$, $SE = .02$, $p < .001$); (b) students' engagement in fall of fifth

grade and their subsequent engagement in fall of sixth grade ($z = 5.19$, $SE = .02$, $p < .001$); (c) teacher support in fall of fifth grade and students' re-engagement at the end of the year ($z = 3.59$, $SE = .01$, $p < .001$); and (d) teacher support in fall of fifth grade and students' engagement after the middle school transition ($z = 4.76$, $SE = .02$, $p < .001$).

Teacher Support and Coping as Resources

Finally, we wanted to examine more closely the motivational outcomes of students who received different levels of resources in fifth grade. We looked at profiles of students who reported very high (i.e., in the top third) levels of both teacher support and coping profiles, as compared to students who reported very low (i.e., bottom third) levels of either or both. As seen in Figure 4.3, students who reported high levels of both resources fared better than their less resourced peers: both their re-engagement at the end of fifth grade ($M = 3.40$, $SD = .21$) and their engagement at the beginning of sixth grade ($M = 3.33$, $SD = .45$) were higher than those of students who reported extremely low levels of teacher support and relatively maladaptive coping profiles ($M = 3.13$, $SD = .32$ and $M = 2.77$, $SD = .44$, for re-engagement and subsequent engagement, respectively). Students who reported high levels of just one resources or the other, or middle levels of both, fared better than students with extremely low levels of resources but not as well as students with high levels of both ($M = 3.28$, $SD = .32$ and $M = 3.06$, $SD = .44$, for re-engagement and subsequent engagement, respectively). Most importantly, for students who received high levels of teacher support and had more

adaptive coping repertoires, the drop in these motivational outcomes⁴ as they made the transition to middle school was not significant, $t(50) = -1.27, p = .21$. In contrast, that decrease was significant for both students with low teacher support and low coping profiles ($t(40) = -5.53, p < .001$) and for students who reported middling levels of both resources ($t(188) = -7.09, p < .001$).

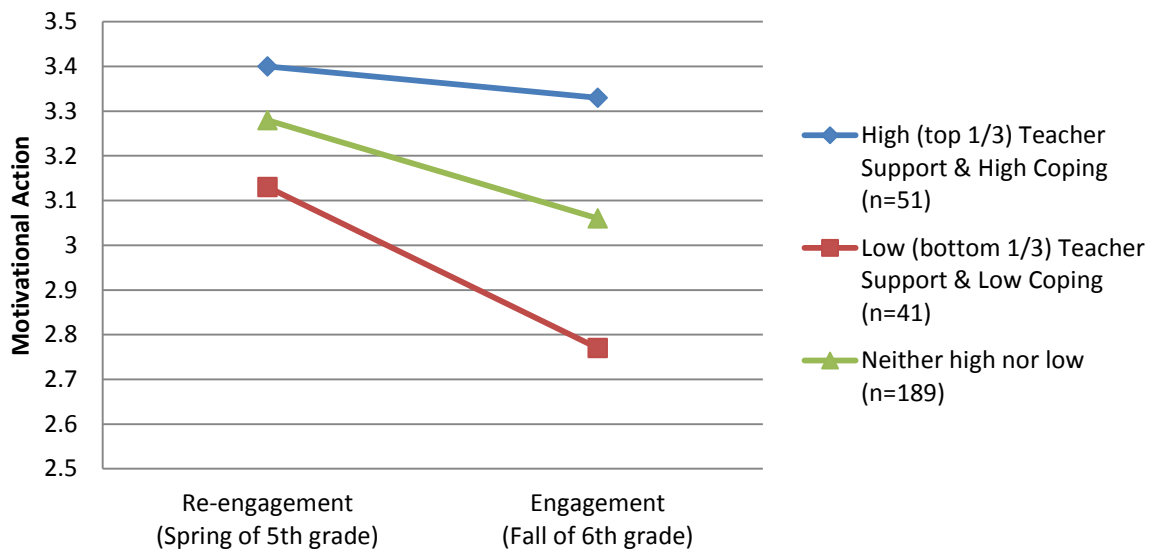


Figure 4.3. Mean levels of students' motivational actions (engagement and re-engagement) across the transition to middle school according to resources available in fifth grade (teacher support and coping profile). Responses could range from (1) Not at all true to (4) Very true.

Discussion

The present study supports the proposition that social and motivational resources

⁴ It is important to note that the markers of motivational action available in spring of 5th grade and fall of 6th grade are not the same measured variable at both time points. However, students' mean levels of engagement in spring of 5th grade were not significantly different from those of their re-engagement ($M = 3.25, SD = .37$ & $M = 3.29, SD = .31$, respectively), and the pattern of findings over the transition did not differ when engagement was used in place of re-engagement in spring of 5th grade.

students accumulate in fifth grade can be powerful tools to ease the often difficult transition from fifth to sixth grade. Specifically, structural modeling was used to examine whether teacher support and students' own ongoing engagement at the beginning of fifth grade seemed to be resources for students' coping and re-engagement at the end of the year, which could then bolster their engagement and subsequent achievement after the transition to middle school. The model provided a good fit to the data, indicating initial support for the proposed process.

In line with expectations, mediation analyses supported the central role of students' coping profiles in the model. Tests of indirect effects showed students' coping profiles at the end of fifth grade to be an important intervening variable between the resources they accrued at the beginning of the year (teacher support and ongoing engagement) and their future motivational actions (subsequent re-engagement and engagement). In this way, students' coping represents an important mechanism through which teacher support and prior engagement may help propel students to maintain momentum as they make the transition to middle school, culminating in continued engagement and academic success.

Importantly, both teacher support and adaptive coping profiles provided unique benefit to students' motivation as they transitioned to middle school. Examination of motivational outcomes across the transition for students with differing profiles of resources in fifth grade revealed a clear picture, suggesting that even though having access to one resource or the other was better than none, students who reported both

high teacher support and highly adaptive coping profiles evinced the highest levels of re-engagement in spring of fifth grade as well as the highest levels of subsequent engagement at the beginning of sixth grade. In fact, for those students who accrued both types of resources throughout fifth grade, markers of motivation did not decrease significantly as they moved into sixth grade, whereas both groups of students without access to these resources or access to only one resource saw steep declines in engagement across the transition.

Implications and Future Studies

The results of this study emphasize the importance of ensuring that students are equipped to deal effectively with struggles and setbacks *before* they are faced with challenges; the resources students had accumulated by the end of fifth grade made a material difference to how effectively they were able to maintain their motivation as they progressed to sixth grade, which had a direct impact on their academic success. Thus, it is essential to consider carefully what it takes to prepare and strengthen students' capacities to cope adaptively with the inevitable obstacles faced in school, particularly over the transition to middle school.

Coping as central to motivational resilience. This study provides some of the first empirical evidence of the central role coping plays in the maintenance of motivational resources (engagement and re-engagement) that have been found to directly support student achievement. Particularly when faced with the friction that stress can put on motivation, students' ongoing engagement may not be enough on its

own to prevent declines in motivation. However, if students have an adaptive coping profile at the ready, this appears to provide a direct path back to re-engagement, thus helping to mitigate subsequent motivational deterioration.

Engagement researchers may benefit from a closer examination of how students respond to stress and challenge (Christenson et al., 2012). Work on coping may offer an essential partnership to the field of engagement – engagement is well-established as a key driver of critical student outcomes, while coping is an important player in the recovery and maintenance of that energy and enthusiastic participation in the learning process. It would be of particular interest to examine how students' trajectories of coping profiles across this transition might impact their engagement and re-engagement in subsequent years, but the current study did not have access to students' coping profile scores after they completed the transition to sixth grade. Future studies would benefit from measuring students' full coping repertoires across that transition to allow for the examination of these effects.

Engagement and teacher support as resources. Results from this study add to the growing evidence supporting the importance of maintaining students' classroom engagement, both because of its many direct influences on student outcomes (Christenson et al., 2012), but also because it seems to provide essential energy that can directly assist students in dealing effectively with challenges. Moreover, support offered by teachers can also buttress students' capacities to respond adaptively to academic setbacks and challenges. In this study, when teachers provided classroom

environments that were warm, well-structured, and supportive of students' individual perspectives, students used more adaptive coping profiles. Both students' ongoing engagement and their experiences of teacher support were important, over and above the influence of the other, in preparing students to respond to difficulties experienced later in the school year.

Teachers can help students to optimize their coping both by solidifying individual adaptive strategies (such as strategizing or commitment) and preventing maladaptive strategies (such as concealment or projection), but also by helping students to expand their available repertoires – having access to a wider, more flexible menu of possible responses can help provide a variety of appropriate adaptive next steps when challenge is encountered. However, the current study examined teacher support only at the beginning of fifth grade. It will be important to examine the effects of teacher support on students' coping and subsequent engagement as they progress through the middle school transition; much could be learned by examining the stability and change of students' support systems across their school careers.

Taken together, these results are a reminder of the dynamic, self-amplifying nature of classroom environments. Teachers and students work together in tightly coupled systems, where teacher support is essential in promoting students' motivational and academic outcomes, but students' motivational states also impact the supports they receive from their teachers (Pitzer & Skinner, 2015; Skinner & Belmont, 1993). Coping may be a key lever in this system, providing a tool for students to use to help maintain

traction when the path ahead is challenging.

Finally, the current study examined just two potential resources to which students may have access as they prepare to transition to middle school. Engagement and teacher support are certainly not the only resources that can influence students' coping. Moving forward, it will be important to also consider and measure other factors that may impact how students respond to challenge, for example, mindsets about intellectual abilities (Yeager & Dweck, 2012), self-beliefs such as perceptions of competence (Schunk & Pajares, 2005), or development of a sense of ownership and purpose about learning (Damon, Menon, & Bronk, 2003).

Limitations of the Current Study

It is important to consider the implications of this study in light its strengths and limitations. One strength was its consideration of both students' and teachers' perspectives on students' classroom behaviors, but the data still all relied on survey measures. Although students' use of many coping strategies (such as self-encouragement, mental escape, or rumination) require the students to report on them directly, future studies could benefit from using observational measures of engagement, teacher support, and re-engagement to enrich the survey measures.

Second, the current sample was composed almost entirely of students from white, middle class backgrounds. It will be important to replicate the findings on more diverse samples, particularly for students from a variety of ethnic and socioeconomic backgrounds who experience significant sources of additional stressors that require higher levels of coping (Evans & Kim, 2013; Spencer, 2006).

Third, because students were nested within classrooms, it is important to consider the hierarchical structure of the data by examining the relative variance accounted for at the student and classroom levels. Due to the structure of the data collection, it was not feasible to use hierarchical linear modeling (HLM) for the analyses in this study (Raudenbush & Bryk, 2002). Because students were reporting in a general sense about their teachers rather than about their specific homeroom teacher and because it was the teacher who claimed to know the student best (rather than the homeroom teacher) that provided information about each student, nesting due to classroom should be minimized, but future studies should utilize HLM to confirm.

Conclusion: Implications for Teachers

It is clearly important for teachers to strive to elicit students' engagement – it both provides a direct service to learning, and may also provide energy that can create resources students will take with them going forward. As such, engagement is an important resource that can help students as they face new challenges and setbacks, such as transitioning to middle school. However, this study suggests the urgency of not only supporting students' coping repertoires through their engagement, but also by providing well-attuned, optimally structured, and autonomy supportive classroom environments. These supportive teaching practices can create relationships that help students develop and solidify strategies for responding effectively when things don't go as planned, which can help them maintain the engagement and enthusiasm that were so important in the first place.

The study of how students cope with challenges and setbacks in school is essential for understanding the process of motivational resilience, because it is what students actually *do* in the face of stress that determines whether they will ultimately bounce back (i.e., re-engage) or give up, and it is this return to engagement that can propel students toward scholastic success. Encouragingly, strategies can be taught, and interventions to help students learn to cope more effectively can be implemented successfully in classroom settings (Pincus & Friedman, 2004). By better understanding how to shore up students' adaptive coping skills and increase the likelihood that they will use them (instead of relying on maladaptive strategies), educators can take one more step toward creating classroom contexts that are conducive to students' re-engagement and persistence.

Chapter 5

Discussion

This project was organized around two empirical studies examining students' *motivational resilience* as they make the often difficult transition from elementary to middle school. Chapters 1 and 2 provided a foundational discussion of the components of motivational resilience and its antecedents and consequences. Chapter 3 described a study that explored the external dynamics of motivational resilience over the course of a single school year, and the study described in Chapter 4 explored whether students' ongoing engagement and teacher support were resources for adaptive coping and re-engagement as they transitioned to middle school. This chapter will briefly summarize those studies, followed by a discussion integrating these findings with existing work on motivational resilience and its components. The strengths and limitations of the project will be presented, culminating in a discussion of the utility of this conceptualization of motivational resilience, particularly regarding its implications for teachers and researchers.

Summary of Studies

Study 1: External dynamics within the school year. The positive connections among students' capacities to engage fully, cope adaptively, and bounce back from obstacles and setbacks in their academic work have generally been found to work together in ways that suggest they can form self-sustaining (or self-amplifying) motivational systems over time. For example, in a study of these internal dynamics

(Skinner, Pitzer, & Steele, 2015), students' engagement in the classroom was found to shape their academic coping, which in turn contributed to subsequent persistence on challenging tasks, which then fed back into ongoing engagement. These internal dynamics may sustain resilience for students who are initially high in engagement, but could also amplify motivational vulnerability for students initially high in disaffection.

This study examined the *external dynamics* of motivational resilience to identify the role that outside forces play in shaping such systems. Grounded in self-determination theory (Deci & Ryan, 1985, 2000), the study examined feedforward and feedback effects between students' composite motivational resilience and a set of hypothesized antecedents and consequences, and also investigated whether teacher support can shift established motivational patterns.

Using self-report information from 1020 3rd-6th grade students collected in fall and spring of the same school year (including achievement data from a subset, $n=365$), multiple regressions predicting changes from fall to spring largely supported the proposed model. Students' motivational resilience predicted changes in achievement, which itself predicted changes in motivational resilience. Students' personal resources (self-perceptions of relatedness, competence, and autonomy, and corresponding catastrophizing appraisals) and perceptions of teacher support (warmth, structure, and autonomy support) predicted changes in motivational resilience across the school year, and reciprocal effects were also evident. Moreover, teacher support was crucial: Students who began the year with at-risk motivational profiles, but who also

experienced high teacher support, ended the year on par with low-risk students; whereas students who began the year with resilient profiles but experienced low levels of teacher support ended the year at-risk. Discussion focused on identifying levers for intervention and the essential role teacher support plays in this dynamic motivational system.

Study 2: Resources for coping across the middle school transition. This study looked more closely at how the components of motivational resilience and its antecedents and consequences play out as students make the transition from fifth to sixth grade. Specifically, it tested a structural model examining the extent to which students' ongoing engagement and teacher support act as resources that encourage adaptive coping and re-engagement, which then lead to continued engagement and subsequent achievement. Within this multi-step process, students' coping was predicted to be a particularly important mediator between students' resources at the beginning of fifth grade and their subsequent motivational actions and achievement. Additionally, the study also examined differences in patterns of motivation across the transition for students who had high levels of teacher support and adaptive coping profiles as compared with students who had fewer of such resources.

This study used self- and teacher-reported information collected each fall and spring about 281 students as they progressed from fifth to sixth grade. Achievement data were also obtained from school records. The hypothesized model was evaluated using structural equation modeling, which provided an excellent fit to the data.

Students' coping profiles were found to be a crucial intervening variable in the process of motivational resilience, mediating the relationships between (1) their ongoing engagement and teacher support at the beginning of fifth grade and (2) their subsequent re-engagement and engagement. Most importantly, students who accrued high levels of teacher support and had highly adaptive coping profiles by the end of fifth grade fared better in their motivational actions (re-engagement and engagement) as they made the transition to middle school than did their less-resourced peers. Students who had access to high levels of both types of resources exhibited higher levels of re-engagement at the end of fifth grade and engagement at the beginning of sixth grade than did students who reported extremely low levels of teacher support and maladaptive coping profiles, or middling levels of both supports. Moreover, students who had access to high levels of both resources did not decrease significantly in their markers of motivation across the transition, whereas students with fewer resources showed marked declines as they moved from fifth to sixth grade. Discussion focused on the importance of student engagement and teacher support as resources for students' coping and the central role coping plays in the process of motivational resilience.

Integration of dissertation studies. As outlined in Chapter 1, the goals of the current studies were threefold: (1) to look at motivational resilience within the structure of an established motivational model, the self-system model of motivational development (SSMMD; Connell & Wellborn, 1991; Skinner, Furrer, Marchand, & Kindermann, 2008), in an attempt to identify potential levers for intervention (e.g.,

teacher support) and explore how those supports affect future action; (2) to examine whether students' motivational resilience is connected to their educational outcomes (i.e., achievement); and (3) to investigate whether resources such as teacher support can help students to more successfully navigate the transition to middle school – that is, to cope more constructively over time, and re-engage rather than give up when faced with challenges and setbacks in school. Taken together, the studies described in Chapters 3 and 4 contribute significant understanding to these questions.

First, the SSMMD seemed to provide a useful framework through which to understand motivational resilience. Study 1 examined the individual antecedents suggested by the SSMMD (i.e., personal and interpersonal resources) to identify which resources could be used as levers to boost students' motivational resilience across the school year; each type of teacher support (warmth, structure, and autonomy support) and personal resources (self-appraisals of relatedness, competence, and autonomy, and corresponding catastrophizing appraisals) predicted changes in students' motivational resilience from fall to spring, and their motivational resilience itself predicted changes in their achievement. Moreover, support for each of the reciprocal links suggested by the SSMMD (e.g., that students' motivational resilience would also predict changes in the amount of teacher support received) were also found, providing further evidence for the dynamic nature of these relationships. And, the structural model examined in Study 2 also demonstrated strong support for the process as it progresses from teacher support via the components of motivational resilience on to achievement, across four time

points as students progressed from fall of fifth to spring of sixth grade.

Second, motivational resilience did have an impact on students' achievement. Not only can students profit from the reciprocal benefits of increases in their self-perceptions and teacher support seen in Study 1, but higher motivational resilience also directly predicted increases in academic achievement across the school year. And, the structural model examined in Study 2 also provided support for achievement's role as an outcome of the process of motivational resilience. However, more research is needed here to elucidate the strength of these connections, particularly since in Study 1 this link was only significant in the models where emotional reactivity was not included in the composite motivational resilience score. Additionally, in the future, examination of students' achievement scores across multiple time points would facilitate seeing both feedforward and feedback effects of achievement.

Finally, both studies provided further exploration into the role teacher support plays in promoting students' motivational resilience. In Study 1, each component of teacher support was shown to predict changes in students' composite motivational resilience from fall to spring of the same school year, and Study 2 included teacher support as a key resource (along with ongoing engagement) for students' academic coping. In both studies, examination of profile analyses in which students received high versus low levels of teacher support showed teachers to be a crucial resource that could help counteract declines in students' motivational resilience.

Keeping these issues in mind, the next section of this chapter will consider the

utility of the overall conceptual model of motivational resilience and its component parts, its strengths and limitations, and contributions to the field.

Implications and Future Studies

Model of motivational resilience. This project, as part of a larger program of research, was founded on a conceptualization of *motivational resilience* which brought together students' ongoing engagement, emotional reactivity, academic coping, and re-engagement in the face of difficulties and setbacks in school. In this conceptualization, engagement is seen as an energetic resource that creates momentum that can help students to move through obstacles in constructive ways, whereas disaffection saps students of that energy, making it more likely that their reactions to challenge will be more maladaptive. The way students move through these setbacks (i.e., how they cope with the challenge) is thought to make a difference to whether they will re-engage with the task at hand or give up, which contributes to their motivational state (i.e., engagement) going forward. Previous research has demonstrated the dynamic nature of this process (Skinner et al., 2015; see Appendix A), lending credence to the integration of these processes under the conceptualization of motivational resilience.

It is important, however, to revisit the utility of conceptualizing these components as part of the same subsystem rather than as separate, independent pieces. What is to be gained by thinking about *motivational resilience* as its own construct? What value does it contribute to the field? Are there drawbacks?

Consideration of motivational resilience as a composite construct has been

extremely instructive. By examining students' engagement, emotional reactivity, coping, and re-engagement in tandem, each of these independent fields of research has gained important information about its target construct that had not been explored before. Moreover, these studies have shed light on the importance of motivational resilience as a whole, examining its antecedents from the perspective of impacting a *process* of motivational resilience rather than just one component or another. The following sections will explore these benefits and what was learned about each component of the model, followed by a discussion of potential drawbacks.

Engagement vs. disaffection. Extant research on students' motivation in the classroom has been largely centered around students' engagement versus disaffection (Christenson, Reschly, & Wylie, 2012). Over recent decades, engagement has been firmly established as a key protective factor in students' educational trajectories – it predicts positive outcomes such as achievement and learning (Jang, Kim, & Reeve, 2012; Ladd & Dinella, 2009; Reyes, Brackett, Rivers, White, & Salovey, 2012) and protects students from paths of dropout or other risky behaviors (Li & Lerner, 2011; Wang & Fredricks, 2014). But, until engagement was considered in the context of the larger model of motivational resilience, its connections to students' academic coping were rarely considered.

One of the most important findings of this program of research has been that a key role of students' ongoing engagement, in addition to its virtues outlined above, is as a motivational resource for students' next steps. As such, the supply of energy

engagement provides is a valuable resource for coping (Skinner et al., 2015), something neither the engagement nor the coping fields had previously recognized. Students who are more highly engaged have momentum that can assist them in approaching new challenges in a constructive manner, by seeking instrumental help from a teacher or friend, selecting a new strategy, looking to someone for comfort or self-soothing, or reminding themselves of the importance of the task at hand. In contrast, however, disaffected students appear not only to be missing the benefit of that extra boost of energy that can be so useful in helping them to persist in the face of setbacks, but they also have to combat the existing drag of their disengaged state. A student who is disaffected is already disconnected from the task at hand, which can add friction when a new challenge is encountered, making it more difficult to respond in an adaptive way. When a student is already disconnected from the learning process, it becomes more likely for him/her to respond in ways that take the student further away from the task at hand: to blame another for the difficulty (e.g., the teacher), to say they didn't care about the task anyway, to rely on distraction, to get stuck in obsessive thoughts without selecting a clear strategy to move forward. Each way of maladaptive coping employed adds additional pressure to the already flagging energy of the student's motivational system.

The structural model tested in Study 2 took one small step in exploring the role of students' engagement as an energetic resource for their subsequent coping and re-engagement. Findings indicated support for this energizing role, but future studies

would benefit from a closer examination of how students' trajectories of engagement over a longer period of time are related to the ways they respond to setbacks. Future experimental studies could also offer insight by manipulating students' engagement to observe how it may influence the ways they deal with setbacks.

Emotional Reactivity. This component of the proposed model of motivational resilience required the most revision in terms of conceptualizing its function within the model. In early conceptualizations of motivational resilience, we assumed that emotional reactivity would be a motivational vulnerability – that students who reported high levels of emotional reactivity would subsequently utilize more maladaptive coping strategies and therefore be more likely to give up rather than re-engage when they encountered an obstacle in school, whereas students who were less emotionally reactive would cope more constructively and be more likely to re-engage with the challenging task. Moreover, we assumed that students' ongoing engagement would buffer them from this vulnerable, highly reactive state.

We were surprised to discover that, as seen in the findings from Study 1, this was not the case. Although highly reactive students did utilize more maladaptive coping strategies and students who responded with more equanimity did have more adaptive coping profiles, the protective role of engagement was not evident: Disaffected students reported being extremely upset by difficulties, but so did engaged students. Likewise, some engaged students reported low levels of emotional reactivity, but so did some disaffected students. These findings were informative, suggesting that the role of

emotional reactivity in the model of motivational resilience was more nuanced than we had initially expected.

It was by looking at emotional reactivity through the lens of the model of motivational resilience that we were able to begin clarifying its role in this complex system. Engagement did not, as we had expected, protect students from distress, but neither did high emotional reactivity prevent students from re-engaging (although it did make it more likely that they would give up in the face of setbacks). It seemed as if emotional reactivity, at least as we have measured it, may contain *both* the emotional distress that we expected engagement to buffer, but also a foundation of caring or commitment: At the root of a student who is upset about not doing well is an underlying regard for the importance of their school performance.

Further study is needed to elucidate the precise role emotional reactivity plays in students' motivational resilience. Findings from Study 1 suggest that, although the role is not what we had predicted, emotional reactivity is still an active component of the motivational resilience system. Person-centered analyses would be useful in exploring the variety of different possible motivational patterns and their outcomes. It would be particularly interesting to compare students' profiles based on their levels of emotional reactivity as it clusters with other components of motivational resilience. For example, examining motivational trajectories for students who exhibit low emotional reactivity and are highly engaged may reveal a story that is clearly different from that for students who are also engaged but get very upset in the face of difficulty. Similarly, it would be

interesting to examine outcomes for what may be the most maladaptive combination, a student who shows little emotional reactivity despite their disaffection. In this case the equanimity may indicate a state of amotivation, which can be particularly difficult to overcome, whereas a highly reactive disaffected student at least still shows that spark of caring. Different clusters of types of coping based on level of emotional reactivity may also be evident, and could be instructive to students' future re-engagement.

Coping. Examination of students' responses to obstacles and setbacks have affirmed coping as a central player in the model of motivational resilience. Viewing coping through this lens has revealed, just as it did for engagement, a new role that had not been previously discussed in the coping literature. By viewing motivational resilience as a system, it becomes clear that coping is one important mechanism by which you get from ongoing engagement to re-engagement, and that re-engagement is essential for the maintenance of ongoing engagement and achievement (as demonstrated in Study 2). As such, decades of argument in the field of coping about which (if any) ways of coping could be considered to be "adaptive" or "maladaptive" (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001) may have some resolution: *adaptive* strategies are the ones that lead to re-engagement and persistence, whereas *maladaptive* strategies bring progress to a halt.

Adaptive coping promotes students' re-engagement precisely because each type of adaptive coping (i.e., strategizing, help-seeking, comfort-seeking, self-encouragement, or commitment) helps equip students with the informational,

motivational, or emotional resources they need to move forward toward the task at hand. For example, a student who runs into trouble and turns to the teacher for assistance (i.e., *help-seeking*, one of the adaptive ways of coping) will, ideally, receive from the teacher strategies or information that will allow the student to continue working toward the goal (i.e., to re-engage). Similarly, if the student turns to *strategizing* and selects a new strategy to try, that allows them to get back to interacting with the initial task.

On the other hand, a student who does poorly on a test and subsequently goes to a space of thinking “this test was too hard, it’s the teacher’s fault” (i.e., *projection*) can get stuck by focusing their energy on being mad at the teacher rather than focusing on the task. This, along with the other maladaptive ways of coping (confusion, escape, concealment, self-pity, and rumination), are dead ends that do not bring the student back to the learning activity. It is notable that the two “less bad” maladaptive strategies, are the ones that allow the student to have some space to regain energy (by escaping for a little while) or to stay with the task, if only mentally (rumination implies a subtle form of engagement), lending support to coping’s role as a bridge to re-engagement.

Moving forward, these new insights about *why* certain ways of coping are more constructive than others should be useful to a field that historically has had a difficult time demonstrating the positive impacts of adaptive coping (Compas et al., 2001). By considering students’ coping in the context of their engagement and re-engagement, it becomes an empirical test about whether a certain response pattern is constructive or

not. Motivational resilience allows a window into how the mechanism works; maladaptive strategies are troublesome because they distract students from getting back to the challenging task, and adaptive strategies are effective because they help students persist.

Importantly, another lesson learned from these studies is that it seems to be the students' overall repertoire of coping used, rather than the use of any single strategy (either adaptive or maladaptive) that determines whether the student will be effective in bouncing back from problems and setbacks (Skinner et al., 2015). Though clearly not used all at once, having a profile of possible (especially adaptive) coping responses is valuable because it provides options about which strategy will be most effective in a particular situation. Having a variety of possible coping strategies on hand also provides the flexibility of having back-up strategies if the student is unsuccessful in their first attempts to deal with the stressor (Cheng, Lao, & Chan, 2014). Future studies examining whether these ways of coping tend to cluster into particular "styles" of coping repertoires may be instructive, particularly as they relate to students' other available resources such as supportive classroom environments or self-system processes and to the students' proclivity to bounce back from challenges and setbacks.

Re-engagement vs. giving up. In this conceptualization of motivational resilience, re-engagement plays an essential role by getting students back to a level of energy (i.e., engagement) that will sustain them. How do students respond when they run into obstacles and setbacks – do they bounce back, or do they give up? Engagement

is necessary for learning, and thus in the model of motivational resilience re-engagement is the critical path back to the kind of enthusiastic participation that invites positive academic outcomes.

By thinking about re-engagement in the context of the other components of the model of motivational resilience, it becomes clear that if the goal is to have a student who is able to bounce back from setbacks, students must have the opportunity to accrue resources earlier in the motivational system. For example, in Study 2 students' re-engagement was resourced by their previous engagement, teacher support, and coping. What is it that allows a student to bounce? At the moment that trouble is encountered, what state does the student need to be in to respond effectively? It is crucial to bolster students' engagement and equip them with a full repertoire of possible strategies from which to choose *before* they are faced with the challenge. Further research is needed to determine whether there may be thresholds of engagement or coping that are sufficient to support this resilient response. It would be interesting to examine these processes across varying time scales (e.g., days or weeks, or even moment-to-moment via observations) to get a better understanding of how these subcomponents of motivational resilience influence one another in this system.

It may also be instructive, however, to explore whether re-engagement is always the most beneficial response to a challenge in school. There may exist situations when it would be adaptive for a student to step away from the task in a calm and committed disengagement – perhaps in a situation of extreme classroom chaos or an academic task

that is particularly non-attuned to the student's needs. Further research is needed to explore re-engagement's presumptive role as optimal outcome, particularly as it relates to what may be a student's autonomous decision to stop rather than giving up following high emotional reactivity or use of a maladaptive coping strategy.

Summary and reflection. Considering students' engagement, emotional reactivity, coping, and re-engagement as subcomponents of a larger system of motivational resilience has revealed much about how each of these subsystems work. But, it is also important to consider potential disadvantages of this conceptualization of motivational resilience. First, as measured in this study, the sheer number of items needed to compile the motivational resilience composite score gets unwieldy (see Appendix B). In future work utilizing this concept, it would be beneficial to develop a short form or alternative methods of assessment to make the measure more manageable, and thus useful, for teachers.

Perhaps more importantly, each of the subcomponents of motivational resilience can itself be a potential "lever" for intervention (Skinner et al., 2015), but once you combine them into a composite score (as was done in Study 1), it is no longer possible to distinguish exactly what is happening during each subsequent step of the process. Therefore, decisions about whether to utilize motivational resilience as a composite score should be made carefully – Depending on the goals of the individual study, decisions can be adjusted based on where the fulcrum is expected to be. For example, in Study 1 the focus was on whether teacher support could shift students' motivational

resilience *systems*, and thus it made sense to consider motivational resilience as a composite construct (given that the internal dynamics of motivational resilience had been previously established; Skinner et al., 2015). On the other hand, Study 2 sought to examine the roles of engagement, teacher support, and coping on subsequent motivation and achievement, which necessitated consideration of the subcomponents individually.

It is important to note that understanding students' motivational resilience as its own dynamic, self-reinforcing system does not mean there is no place for studies that omit some particular piece of the construct or another (as Study 2 omitted emotional reactivity). Engagement can still be seen, for example, as a positive factor simply because it is a strong predictor of achievement. But, by looking at these systems through a motivational resilience lens, we are offered a richer understanding of the underlying mechanisms, the *whys* and *hows* of engagement's importance and how to help students regain that state.

Importance of teacher support. Both studies included in this project focused on teacher support as one potential resource that can help sustain students' motivational resilience. Teachers are in a unique position to be able to intervene in students' motivational systems. Study 1 demonstrated the crucial role teachers play in this dynamic process: Although motivational resilience itself typically contains a self-reinforcing dynamic (i.e., students who exhibit high motivational resilience continue to do well, while students who are struggling tend to accrue still more motivational vulnerabilities over time), the current project demonstrated that this system is not

impervious to intervention.

Well-calibrated teacher support can help compensate for and overcome motivational vulnerabilities, providing opportunities for students to gain footing that can nourish a positive motivational dynamic. In Study 1, this was demonstrated via examination of profiles of students who were motivationally vulnerable (i.e., as measured by reporting extremely high levels of catastrophizing appraisals) but also received extremely high levels of teacher support, compared to students who began the school year with extremely low vulnerability but reported low levels of teacher support. In that study, by the end of the school year students who had had highly supportive teachers had significantly higher levels of motivational resilience, even when students had begun the year at risk, indicating that students' motivational resilience systems seem to be open to influence, even over a relatively short time. Study 2 also demonstrated the importance of teacher support via its inclusion as an important resource for supporting students' coping with academic setbacks and challenges. Future research would benefit from examining these processes over longer periods of time, particularly given that students' experiences of teacher support may vary greatly from year to year as they move to new classrooms and schools (such as during the transition to middle school).

Considering the dynamic nature of students' motivational resilience, it is critical to understand the forces outside that system that can intervene in the otherwise self-reinforcing system. It is important to remember that these dynamics make existing

motivational vulnerabilities difficult, but not impossible to escape. However, the presence of maladaptive coping, for example, is not the “fault” of the child, but rather information about a system that is overwhelmed and in need of additional support (or fewer demands).

Obviously, providing such well-calibrated supports is no easy task. Even with a conscious intention to interact with students in optimally supportive ways, it is easy, because of existing classroom practices, for teachers to interact with students in ways that sustain or amplify existing motivational dynamics. For example, it is easy to picture a teacher who may unintentionally withdraw support from a student who is particularly disaffected or coping via maladaptive strategies such as blaming the teacher. This is understandable especially since, according to the same theory of motivational development upon which the model of motivational resilience is based (Connell & Wellborn, 1991; Deci & Ryan, 1985; Skinner et al., 2008), just as students have needs to feel related, competent, and autonomous, so too do teachers. Dealing with challenging classroom demands such as student disruption, emotional outbursts, or helpless behaviors can directly undermine each of these needs for teachers (Furrer et al., 2014). However, teachers also have the capacity to identify these potentially self-amplifying cycles and to make efforts to intervene, and the knowledge that existing vulnerabilities are likely to amplify over time lends urgency to early intervention efforts. Moreover, these gains made in students’ motivational systems are likely to provide benefits for the teachers’ own enthusiasm for and experience of teaching

(Klassen, Perry, & Frenzel, 2012; Spilt, Koomen, & Thijs, 2011).

Strengths, Limitations, and Future Research

In all research, there exist both strengths and limitations. This section will discuss these ideas as they relate to the current studies, specifically regarding issues of conceptualization, measurement, design, and generalizability.

Conceptualization. A significant strength of these studies is the careful conceptualization of motivational resilience as including the broader theoretical constructs of academic engagement, coping, and re-engagement. Additionally, the Self-System Model of Motivational Development provides a solid foundation for examining these constructs within a self-determination theory perspective. However, the existing dataset that was utilized did not contain markers of all constructs that might be expected to be relevant to students' motivational resilience. For example, it is extremely likely that students' goal orientations and mindsets (Dweck, 2006) play a key role in the way they appraise and respond to challenges and setbacks in school, as would their self-regulatory strategies (Schunk & Zimmerman, 2012), but the current study could not evaluate the role of these constructs in the process of motivational resilience. Future studies could include measures of these constructs to examine how they influence students' motivational resilience. Likewise, several other factors that have been demonstrated to be important for students' academic buoyancy (Martin & Marsh, 2008, 2009) were not measured in the current study (e.g., exhibiting a high level of planning, support from parents and community) but would likely also be important to future

studies of students' motivational resilience.

Measurement. The availability of both teacher-reported and student-reported data is a significant strength of these studies, since having multiple reporters helps to combat the effects of common-method bias. Previous research using this dataset has confirmed that these measures are both internally consistent and reliable. However, all of the included measures are still acquired by surveys, and as many of the constructs measured are observable in the classroom setting, future studies would benefit from attempting to replicate these studies using data collected via observational methods. Additionally, more sophisticated methods than creating a composite score inclusive of the two reporters, such as multitrait-multimethod techniques (Little, 2013), should be utilized for future work, which could allow examination of the contribution of the varying perspectives.

Design. Another significant strength of these studies is the availability of longitudinal data for students across multiple years, allowing for examination of students' developmental pathways over time. The cohort-sequential design can be especially beneficial when looking at age differences, as it allows the researcher to tease apart whether any differences found are truly age effects as opposed to differences according to which wave of data collection students participated in. However, the current studies could not make full use of the available longitudinal data. Particularly for students' coping, Study 2 was limited because students only reported on the full repertoire of coping questions during one of the four years of the study. It would be

instructive to look more closely at trajectories of the other components of students' motivational resilience across the transition to middle school, and future studies should take care to include measures of each subcomponent consistently across time.

Moreover, in the current study the timing of the various data points (collected in October and May each year) is not theoretically grounded. It is conceivable that the time frame over which the processes of motivational resilience and their supports interact may in fact be significantly shorter – perhaps over days or weeks instead of across the whole school year. Future studies will benefit from designs that allow researchers to measure these constructs on time scales more closely aligned with the actual timing of how these reciprocal loops likely play out and stabilize (i.e., across days or weeks, or even moment by moment, rather than months).

Generalizability. The sample included in this study is unique, in that the entire school district participated in the project, which is a significant strength in the quest for generalizability. However, the students in the district consisted of predominantly working-class, Caucasian families, so future studies will be necessary to confirm that these models hold true in more diverse samples.

The age of the data used in this study is also notable, as they were collected in the 1990s and are thus over 20 years old. Many changes have taken place in the intervening years that could potentially lessen the generalizability to current generations of students, such as technological innovations like the Internet or iPads that have changed the process of information transmission, or educational policies like No Child

Left Behind or the Common Core State Standards that have impacted educational systems' priorities in recent years. Again, it will be necessary to replicate the results of these studies in order to assess their generalizability across time.

Applications for Teachers

This project explored a new conceptualization of motivational resilience as comprising the dynamic interactions among students' ongoing engagement, emotional reactivity, coping, and re-engagement. This conceptualization helped clarify the roles of each subcomponent, and also provides new information for teachers as they attempt to interact with students in ways that can have a lasting positive effect on their motivational (and by extension, academic) outcomes.

The primary lesson learned from this project is that the mental model teachers are building about students' motivation should have a place not just for engagement, but also for coping and re-engagement. These components work closely together and the maintenance (or establishment) of students' ongoing enthusiasm during classroom learning activities depends on their abilities to respond adaptively and bounce back from challenges and setbacks.

In such a complex system, it is impossible for teachers to look at every piece of the puzzle and how it impacts every other piece (especially when considering both feedforward and feedback effects), all at once. Having a conceptualization of motivational resilience that is able to be considered in its composite form and yet still be examined in individual pieces is an enormous asset as teachers and researchers

attempt to find levers for intervention. These levers exist within motivational resilience itself – improvement in any given subcomponent may have salutary effects for the other subcomponents – but outside forces can also play a significant role in eliciting these improvements. For example, teachers can help students to expand their coping repertoires by learning new adaptive strategies (both by direct instruction and modeling of effective coping techniques) and discovering how to select the most appropriate or effective strategy for a particular situation. Moreover, bolstering academic coping may have transfer to life outside the classroom, just as successfully building everyday resilience can help students be prepared to bounce back from larger struggles (Martin & Marsh, 2009).

Importantly, this conceptualization of motivational resilience clearly reminds teachers that it is not just about teaching students the *how* of individual coping strategies (e.g., how to get help, or how to self-soothe), but also about the protective nature of a resilient motivational state that the student and teacher may have created together *before* the student encounters a setback. Motivational support offered to students can help them to cope more adaptively in a host of ways – for example, a student who feels like a welcome part of their classroom context will likely be more inclined to go to the teacher for instrumental help or comfort, a well-structured classroom provides scaffolding for a student’s strategizing attempts, and students who are offered choices and can see the relevance of classroom activities have a clearer path to using coping strategies involving reminders of why the activity was important to them in the first place (i.e.,

commitment). In contrast, students who do not experience such supportive classroom contexts may feel angry at or distrustful of the teacher (leading to projection or concealment), lost in a chaotic classroom activity (leading to confusion), or lacking connection to the underlying purpose of the learning activities (leading to mental escape).

Classroom contexts can benefit from teachers' provision of motivational supports to their students, but also from attention to teachers' own responses to challenges in the classroom. For example, teachers' own motivation can be bolstered by viewing student disaffection as information about the students' current state (and therefore a manageable challenge) rather than as evidence that students dislike them or that they are incompetent at teaching. Viewed through the perspective of the models of motivational resilience and the SSMMD, subtle shifts in perspective or experience have the potential to pivot, by extension, entire classroom motivational systems. By laying this important groundwork, teachers can create environments that may form virtuous motivational cycles which, based on feedback effects, can improve the classroom experience of both students and the teachers themselves. Built on a foundation of these motivational dynamics, interventions that facilitate teachers' willingness and capacities to provide students with optimally calibrated support can have powerful effects on students' motivational systems, over the transition to middle school and beyond.

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Appendix A

**Student Engagement as an Energetic Resource for Academic Coping during
Elementary School: The Internal Dynamics of Motivational Resilience across the
School Year**

Ellen Skinner, Jennifer Pitzer, and Joel Steele

Portland State University

Abstract

Background. How children and youth deal with academic challenges and setbacks makes a material difference to their learning and school success. Hence, it is important to study the motivational resources that allow students to cope constructively.

Aims. A model of motivational resilience was used to frame a study examining whether students' engagement (vs. disaffection) in the classroom shapes their academic coping, and whether adaptive (vs. maladaptive) coping in turn contributes to subsequent re-engagement with challenging tasks (vs. giving up), which then feeds back into ongoing engagement (vs. disaffection).

Sample. In fall and spring of the same school year, 650 third through fifth graders completed measures of each component of motivational resilience.

Methods. The measure of coping assessed five adaptive and six maladaptive ways, which were calculated as allocation and profile scores for each student.

Results. Structural equation modeling revealed that the model of motivational resilience was a good fit for data from both fall and spring. Multiple regressions examining whether each step in the process predicted *changes* in the next step from fall to spring, also provided support for each step, except the one from Engagement to Emotional Reactivity. At the same time, allocation scores revealed some differentiation in how specific ways of coping functioned, as consequences of engagement or disaffection, and as predictors of changes in re-engagement or giving up.

Conclusion. Taken together, findings suggest that these internal dynamics may

form self-perpetuating cycles that cement or augment the development of children's motivational resilience and vulnerability across their school careers.

**Student Engagement as an Energetic Resource for Academic Coping during
Elementary School: The Internal Dynamics of Motivational Resilience across the
School Year**

Schools can be challenging places for students. When asked about the most stressful aspects of their lives, children and adolescents typically rank school and schoolwork as among the top three (Boekaerts, 2002; Spirito, Stark, Grace, & Stamoulis, 1991). How children and youth deal with these demands, especially when tasks are challenging, can make a material difference to their short-term learning, as well as their eventual school completion and success. Hence, it is important to study how students can cope constructively with academic challenges (Boekaerts, 1993; Dweck, 2006; Martin & Marsh, 2009; Skinner & Wellborn, 1997). A process model of *motivational resilience* suggests that students' underlying academic motivation may play an important role in shaping stress and coping at school (Skinner & Pitzer, 2012; see Figure 1).

According to this model, academic stressors (such as difficult assignments or poor performance) can exert a downward pressure on students' motivation. How students respond to these problems influences whether they re-engage with challenging academic material or give up. Some children cope adaptively: They problem-solve, seek help and support, encourage themselves to continue, and renew their commitment to doing well in school. These ways of coping allow students to return to academic activities with renewed energy and strategies for dealing with tasks more effectively. In

contrast, other students react in ways that divert them from constructive re-engagement: They attempt to escape (mentally, if not physically), conceal their problems, become helpless, dwell on their misfortunes, ruminate about stressful events, or blame others. These maladaptive reactions escalate distress, do not secure the help students need to re-engage, and increase the likelihood they will give up.

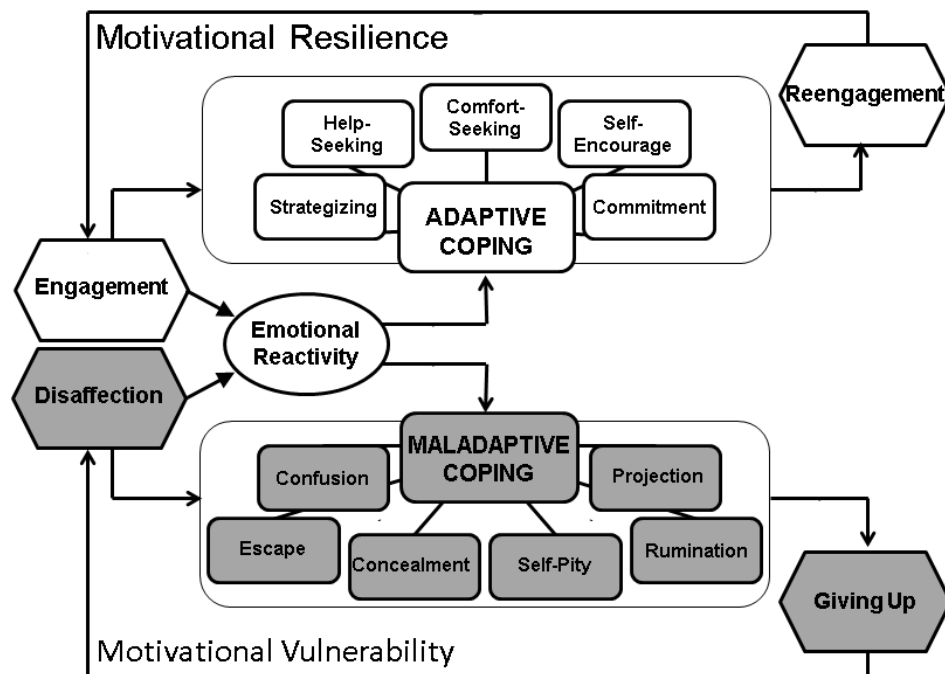


Figure 1. A model of motivational resilience: Problems and obstacles exert a downward pressure on motivation fueled by stress reactivity. Ongoing engagement acts as an energetic resource allowing students to cope in more adaptive ways, leading to re-engagement with the challenging material. In contrast, students who are more disaffected do not have such resources when they run into trouble, and hence utilize more maladaptive coping strategies, leading them to give up on challenging academic work.

Student Engagement and Disaffection as Energetic Resources and Liabilities

As depicted in Figure 1, the first step in the process model is *engagement versus disaffection*. Engagement refers to students' constructive, whole-hearted, cognitively-focused participation in learning activities (Fredricks, Blumenfeld, & Paris, 2004). A key notion of this model is that ongoing *engagement* serves as a resource for adaptive coping by providing energy, momentum, and stamina to sustain and guide students when they encounter academic problems. It is as if, when engaged students run into trouble, they are not looking for reasons to stop, but instead are looking for information and strategies that allow them to continue. Hence, engagement can be seen as a direct link to the kinds of adaptive coping that provide a bridge back to constructive re-engagement with challenging academic material (e.g., strategizing and help-seeking), allowing students to recover more quickly from setbacks and difficulties.

In contrast, *disaffection* acts as a risk factor for constructive coping. It adds friction to the process of dealing with already difficult situations, undermines the strength students need to cope effectively, and contributes to more maladaptive coping. Ongoing disaffection represents a state of low energy, passivity, boredom, and even active frustration with academic work (Skinner, Kindermann, Connell, & Wellborn, 2009). It is as if disaffected students are already on the motivational brink, and academic setbacks provide enough additional resistance that their participation simply grinds to a halt, or is deflected away from task involvement and toward the kinds of distressing emotions (such as anxiety, self-pity, rumination, or blaming others) that sap

task-focused energy. Hence, disaffection should increase the likelihood that students will cope maladaptively, which should in turn further derail their engagement with challenging tasks.

Emotional Reactivity and Families of Academic Coping

The next steps in the model of motivational resilience are *stress* and *coping*. Students' distress during demanding academic episodes is reflected in their *emotional reactivity*, or how upset they become when they encounter obstacles or setbacks (Boekaerts, 1993; Connor-Smith et al., 2000). Students can become highly reactive, experiencing elevated levels of distress in response to problems, or they can respond with emotional equanimity and calm. High levels of reactivity may interfere with the regulation needed for adaptive coping, and trigger more maladaptive coping responses.

The third step in the model is coping, that is, how students actually respond to the academic stressors they encounter daily in school. Based on reviews of measures of academic coping (Skinner, Pitzer, & Steele, 2013a; Skinner & Wellborn, 1997) as well as measures of coping during childhood and adolescence more generally (Skinner, Edge, Altman, & Sherwood, 2003), 11 core ways of coping have been identified in the academic domain: (1) five adaptive ways, namely, strategizing, help-seeking, comfort-seeking, self-encouragement, and commitment; and (2) six maladaptive ways, namely, confusion, escape, concealment, self-pity, rumination, and projection, all of which have been incorporated into a multi-dimensional measure of academic coping (Skinner et al., 2013a; see Table 1). Structural and psychometric analyses of this measure have shown

that the item sets designed to capture each way of coping are unidimensional and internally consistent, and the 11 ways can be distinguished, although they are intercorrelated as would be expected (Skinner et al., 2013a).

Re-engagement: Persistence versus Giving up in the Face of Challenge

The final step of the model focuses on whether students persist in the face of academic challenges or give up, which we refer to as *re-engagement*, and others have labeled as mastery (Dweck, 2006) or persistence (Martin & Marsh, 2009). Almost by definition, encounters with stress interrupt the flow of ongoing engagement with academic activities: Automatic processes are not sufficient to make progress on the task. During this “pause,” action can be directed toward obtaining the behavioral and cognitive strategies and emotional energy needed for renewed task involvement, through the use of adaptive ways of coping such as strategizing, help-seeking, self-encouragement, and commitment. These ways of coping are considered adaptive precisely because they promote renewed participation with the challenging material, or re-engagement. Such re-engagement should result in more learning and higher subsequent engagement.

Unfortunately, the “pause” following stressful encounters can also be a dead end-- especially for students who are already disaffected. The low energy and emotional reactivity typical of disaffected students makes it difficult for them to go the extra mile needed for adaptive coping. It is much easier to slide into passivity, confusion, mental withdrawal, self-pity, rumination, or blaming others. These ways of coping are

considered maladaptive, not only because they can amplify distress, but also because they interfere with subsequent task involvement and make it more likely that students will give up. Over time, such patterns can fuel further disaffection, cumulatively increasing students' motivational vulnerabilities.

Goals of the Present Study

The purpose of the current study was to explore the internal dynamics of motivational resilience. Student self-reports of each of the four steps in the model (ongoing engagement, emotional reactivity, coping, and re-engagement), collected from a large sample of elementary school students at two time points during the school year, were used to address two central questions. First, we were interested in whether the overall process model, depicted in Figure 1, provided a good *structural* fit to data from both measurement points. Second, and more importantly, we were interested in examining the *functional* features of the model, that is, whether measures marking each step in the process model could predict *changes* in the hypothesized next step over the school year. Specifically, we examined (1) whether engagement and disaffection in fall predicted changes in emotional reactivity and coping from fall to spring; (2) whether emotional reactivity in fall, in turn, predicted changes in coping across the school year; (3) whether coping in fall predicted changes in re-engagement; and (4) finally, whether re-engagement in fall predicted changes in engagement and disaffection. If all of the proposed functional links are operating as pictured in Figure 1, this would suggest an amplifying dynamic that would maintain or magnify students' initial levels of

motivation (Skinner & Pitzer, 2012). Mapping these internal dynamics would be a first step toward locating promising targets for improvement, and thereby identifying potential intervention levers that can be used to promote students' everyday motivational resilience (Martin & Marsh, 2009).

Methods

Design and Sample

In the current study, data from a subset of children ($N = 650$) from a larger longitudinal study (see Skinner, Zimmer-Gembeck, & Connell, 1998) were used, when students were in grades three through five: 138 3rd grade students (66 boys and 72 girls), 342 4th graders (172 boys and 170 girls), and 170 5th graders (78 boys and 92 girls). Students, who attended public elementary and middle schools in a rural-suburban school district, were predominantly Caucasian (approximately 5% of the students identified as non-white). Students' socioeconomic status (as marked by parents' level of education and occupation) ranged between working and middle class.

Data Collection Procedures

Data were collected at the beginning (October) and end (May) of the same school year by research assistants who administered questionnaires to students in three 40-minute sessions. In each session, one interviewer read the questions aloud while a second interviewer monitored questionnaire completion and answered questions. Students used 4-point Likert scales to indicate whether each item was: Not at all true for me (1), Not very true for me (2), Sort of true for me (3), or Very true for me (4). Hence,

scale scores could range from 1 to 4, with higher scores indicating more of the respective construct.

Measures

Engagement vs. disaffection. Using a measure designed to tap behavioral and emotional participation in (or withdrawal from) learning activities in the classroom (Skinner, Kindermann, & Furrer, 2009), students reported on Engagement, including 5 items tapping behavioral engagement (effort, attention, persistence in learning activities) and 6 tapping emotional engagement (enthusiasm, involvement, interest); and Disaffection, including 5 items tapping behavioral disaffection (lack of effort, withdrawal) and 10 tapping emotional disaffection (boredom, anxiety, frustration) disaffection. Items were averaged into one summary score for engagement and one for disaffection.

Emotional reactivity. Students responded to 11 items tapping the extent to which they react negatively when they run into academic difficulties (e.g., “When something bad happens in school, I feel terrible,” “I get really upset”), which were averaged to form a summary score (Skinner, Pitzer, & Steele, 2013b).

Ways of coping. Students reported on 11 ways of coping with academic problems, using subscales consisting of five items each (Skinner et al., 2013a). Items were randomly mixed and subsets followed one of four stems describing stressful academic events: “When something bad happens to me in school (like not doing well on a test or not being able to answer an important question)...”, “When I run into a

problem on an important test...”, “When I have trouble with a subject in school...”, and “When I have difficulty learning something...”. The measure tapped five adaptive ways of coping: (1) Strategizing, (2) Help-seeking, (3) Comfort-seeking, (4) Self-encouragement, and (5) Commitment; and six maladaptive ways: (1) Confusion, (2) Escape, (3) Concealment, (4) Self-pity, (5) Rumination, and (6) Projection. Construct definitions and item examples are provided in Table 1.

Two kinds of coping scores were calculated: (1) *Allocation* scores, reflecting the proportion of each student’s total coping that was allocated to each way of coping, were calculated by dividing summary scores for each way of coping by each students’ total coping (the sum of their coping across all 11 ways, without reverse coding maladaptive ways); these scores were multiplied by 100; and (2) *Coping Profile* scores, representing the balance of overall adaptive relative to maladaptive coping, which were created by averaging adaptive and maladaptive coping scores, with maladaptive reverse coded.

Re-engagement and giving up in the face of academic challenges and problems. Two sets of self-report items tapped students’ motivational reactions when they encounter academic difficulties. Four items tapped re-engagement (e.g., “When I run into a difficult question, I try even harder”). Five items tapped giving up (e.g., “If a problem is really hard, I just quit working on it”) (Skinner et al., 2013b).

Table 1

Ways of Coping from Each Coping Family utilized for Capturing Adaptive and Maladaptive Coping in the Academic Domain during Childhood and Adolescence.

Adaptive Families and Ways of Coping

<i>Family</i>	<i>Way</i>	<i>Definition</i>
1. Problem-solving	Strategizing: <i>Item example:</i>	Attempts to figure out what to do to solve problems or prevent them in future encounters. “I try to figure out how to do better next time.”
2. Information seeking	Help-seeking: <i>Item example:</i>	Going to teachers or other adults for instrumental aid in understanding material or in figuring out how to learn more effectively. “I get some help to understand the material better.”
3. Support Seeking	Comfort-seeking: <i>Item example:</i>	Turning to others for emotional reassurance, consolation, and cheer. “I talk about it with someone who will make me feel better.”
4. Self-reliance	Self-encouragement: <i>Item example:</i>	Attempts to regulate one’s flagging emotions by bolstering confidence and optimism. “I tell myself I’ll do better next time.”
5. Accommodation	Commitment: <i>Item example:</i>	Attempts to remind oneself why challenging academic work is personally important and worth the effort “I think about how this is important for my own goals.”

Maladaptive Families and Ways of Coping

<i>Family</i>	<i>Way</i>	<i>Definition</i>
1. Helplessness	Confusion: <i>Item example:</i>	Stress reaction in which thoughts or next steps become unclear or disorganized. “When I run into a problem on an important test, I get all confused.”

2.	<i>Escape</i>	<i>Mental Escape:</i>	Attempts to mentally avoid or remove oneself from difficulties and poor outcomes.
		<i>Item example:</i>	“When something bad happens in school, I quit thinking about it.”
3.	<i>Social Isolation</i>	<i>Concealment:</i>	Attempts to prevent others from finding out about the occurrence of negative events.
		<i>Item example:</i>	“I don’t let anybody know about it.”
4.	<i>Delegation</i>	<i>Self-pity:</i>	Feeling sorry for oneself and one’s tribulations.
		<i>Item example:</i>	“I ask myself, ‘Why is this always happening to me?’”
5.	<i>Submission</i>	<i>Rumination:</i>	Preoccupation with the negative or anxious features of a stressful situation.
		<i>Item example:</i>	“When something bad happens at school, I can’t get it out of my head.”
6.	<i>Opposition</i>	<i>Projection:</i>	Blaming other people for the negative outcome.
		<i>Item example:</i>	“I say it was the teacher’s fault.”

Results

Data analyses were conducted in two steps. First, structural equation modeling was used to examine the fit of the overall process model to data from fall and from spring. Second, regression analyses were used to examine whether measures tapping each step in the process model in fall predicted changes in the hypothesized next step from fall to spring.

Descriptive Analyses

Table 2 contains internal consistency reliabilities, means, and standard deviations for all measures at both time points, as well as cross-time correlations. Internal consistency reliabilities for most of the scales were satisfactory, averaging .76. Seven of the 5-item subscales showed reliabilities below .70 in fall; reliabilities for all

Table 2

Descriptive Statistics and Stabilities from Fall to Spring for the Steps in the Process of Motivational Resilience.

<i>Construct</i>	<i>No. of Items</i>	<i>Fall</i>			<i>Spring</i>			<i>Fall to Spring Correlation</i>
		<i>α</i>	<i>Mean</i>	<i>SD</i>	<i>α</i>	<i>Mean</i>	<i>SD</i>	
<i>Engagement</i>	11	.76	3.33	.44	.83	3.29	.46	.59
<i>Disaffection</i>	14	.84	1.84	.53	.86	1.80	.51	.62
<i>Emotional Reactivity</i>	11	.86	2.40	.64	.87	2.30	.62	.59
<i>Adaptive Coping</i>								
<i>Strategizing</i>	5	.65	3.21	.54	.75	3.08	.60	.40
<i>Help-seeking</i>	5	.66	3.21	.56	.74	3.15	.58	.51
<i>Comfort-seeking</i>	5	.75	3.08	.65	.80	2.99	.67	.52
<i>Self-Encouragement</i>	5	.54	3.15	.52	.64	3.03	.56	.42
<i>Commitment</i>	5	.63	3.05	.57	.73	3.04	.59	.42
<i>Total Adaptive Coping</i>	25	.87	3.14	.43	.91	3.05	.48	.58
<i>Maladaptive Coping</i>								
<i>Confusion</i>	5	.73	2.23	.69	.78	2.19	.69	.56
<i>Escape</i>	5	.68	1.88	.60	.70	1.87	.57	.41
<i>Concealment</i>	5	.74	1.99	.69	.80	1.94	.69	.57
<i>Self-Pity</i>	5	.78	2.08	.74	.82	1.95	.71	.60
<i>Rumination</i>	5	.67	2.64	.65	.73	2.51	.65	.51
<i>Projection</i>	5	.75	1.70	.63	.77	1.70	.61	.51
<i>Total Maladaptive Coping</i>	30	.90	2.09	.49	.92	2.03	.49	.65
<i>Coping Profile</i>	55		3.03	.33		3.01	.36	.67
<i>Re-engagement</i>	4	.61	3.55	.48	.69	3.45	.52	.46
<i>Giving Up</i>	5	.74	1.52	.55	.78	1.56	.54	.57

Note. $N = 650$ students in grades three through five. Total Adaptive Coping was the average of all the adaptive ways of coping; Total Maladaptive Coping was the average of all the maladaptive ways. Coping Profile scores were the average of Total Adaptive and Total Maladaptive Coping with Maladaptive Coping reverse-coded.

Table 3

Correlations between the Steps in the Process of Motivational Resilience in Fall and Spring.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. <i>Engagement</i>	---	-.50	-.14	.60	-.60	.63	.49	-.46	.55
2. <i>Disaffection</i>	-.59	---	.55	-.73	.73	-.68	-.35	.59	-.57
3. <i>Emotional Reactivity</i>	-.17	.52	---	-.48	.48	-.40	-.04 ^{ns}	.30	-.22
4. <i>Adaptive Coping Allocation Scores</i>	.64	-.72	-.48	---	-.1.00	(.98)	.47	-.65	.67
5. <i>Maladaptive Coping Allocation Scores</i>	-.64	.72	.48	-.1.00	---	(-.98)	-.47	.65	-.67
6. <i>Coping Profile</i>	.67	-.69	-.41	(.98)	(-.98)	---	.51	-.64	.68
7. <i>Re-Engagement</i>	.57	-.37	-.03 ^{ns}	.48	-.48	.52	---	-.48	(.80)
8. <i>Giving Up</i>	-.51	.69	.31	-.67	.67	-.65	-.52	---	(-.91)
9. <i>Re-engagement vs. Giving Up</i>	.61	-.63	-.22	.67	-.67	.68	(.84)	(-.91)	---

Note. *N* = 650 students in grades three through five. Correlations above the diagonal are from the fall time point; below the diagonal from spring. Correlations in parentheses are between subscales and their larger scales. All correlations are significant at *p* < .001 except as noted. ^{ns} = not significant.

but one of these were above .70 in spring. Cross-year stabilities were high, ranging from .40 to .67, making it more difficult to predict changes over the school year.

Mean levels of the variables suggested that students in the sample were generally well-functioning academically, with high levels of Engagement and low levels of Disaffection, although Emotional Reactivity was moderate, sitting at about the mid-point of the 4-point answer scale. In terms of coping, students reported higher levels of adaptive than maladaptive coping. In general, students also reported that they were able to bounce back from difficulties and setbacks relatively easily, with high levels of Re-engagement and low levels of Giving Up. Correlations (see Table 3) revealed that, as expected, the components of motivational resilience (i.e., Engagement, Adaptive Coping, and Re-engagement) were positively inter-correlated, as were the components marking motivational vulnerability (i.e., Disaffection, Emotional Reactivity, Maladaptive Coping, and Giving Up). Moreover, these two kinds of components were generally negatively correlated with each other. Patterns were replicated in fall and spring.

The only exception was Emotional Reactivity, which did not show strong negative correlations with Engagement (mean correlation of $-.16$) or Re-engagement (mean correlation of $-.04$, *ns*) at either time point. This suggests that, contrary to the model, students who are engaged can still show high negative reactions when they encounter problems; and students who are emotionally upset can still re-engage with challenging academic tasks. Nevertheless, Emotional Reactivity still seemed to be

problematic: It was positively and significantly correlated with both Disaffection and Giving Up (mean correlation of .42).

Ways of coping. Correlations between the 11 ways of coping and the other components of motivational resilience are presented in Table 4. Adaptive ways of coping, and especially Strategizing and Help-seeking, were generally positively correlated with other markers of motivational resilience (Engagement and Re-engagement) and negatively correlated with markers of motivational vulnerability (Disaffection and Giving Up) whereas maladaptive ways of coping, especially Self-pity and Projection, showed the reverse pattern. Especially interesting were the correlates of Emotional Reactivity. Although adaptive ways of coping were uniformly negatively correlated with Emotional Reactivity, maladaptive ways revealed a more differentiated picture: As expected, Confusion, Self-pity, and Rumination showed moderate positive correlations with Emotional Reactivity (mean $r = .42$). However, correlations were lower with Concealment (mean $r = .32$) and Projection (mean $r = .17$), and not significant with Escape. This pattern suggests the possibility that one function served by these latter three ways of coping (which involve hiding problems, blaming others, and shifting attention away from problems) could be to dampen distress.

Table 4
Correlations between Components of Motivational Resilience and Allocation Scores for Ways of Coping in Fall and Spring (Spr).

	Engagement		Disaffection		Emotional Reactivity		Re-engagement		Giving Up	
	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr
<i>Adaptive Ways</i>										
Strategizing	.40	.52	-.50	-.57	-.28	-.32	.43	.49	-.51	-.55
Help-seeking	.45	.50	-.58	-.58	-.42	-.41	.35	.34	-.50	-.51
Comfort-seeking	.40	.41	-.44	-.43	-.29	-.33	.25	.26	-.38	-.40
Self-Encourage	.41	.44	-.54	-.54	-.46	-.42	.28	.29	-.49	-.45
Commitment	.41	.47	-.48	-.50	-.23	-.28	.34	.38	-.41	-.51
<i>Maladaptive Ways</i>										
Confusion	-.32	-.41	.52	.53	.43	.43	-.29	-.26	.38	.40
Escape	-.38	-.40	.31	.32	-.06 ^{ns}	.02 ^{ns}	-.37	-.42	.42	.43
Concealment	-.43	-.48	.40	.47	.30	.33	-.34	-.38	.39	.45
Self-Pity	-.41	-.50	.59	.63	.44	.47	-.30	-.36	.49	.57
Rumination	-.03 ^{ns}	-.06 ^{ns}	.15	.17	.34	.40	.10*	.11**	.04 ^{ns}	.05 ^{ns}
Projection	-.48	-.54	.54	.54	.21	.12	-.42	-.46	.62	.57

Note. *N* = 650 students in grades three through five. All correlations are significant at $p < .001$ except as noted. ** $p < .01$. * $p < .05$. ^{ns} = not significant.

Structural Models

The next set of analyses used structural equation modeling to determine whether the overall model of motivational resilience provided a good fit to the data for adaptive and maladaptive ways of coping separately, and whether they were replicated in fall and spring. As markers of adaptive ways of coping, we used ergodic parcels that reflected the multi-dimensional structure of the measure, by combining one item from each adaptive way (Little, Cunningham, Shahar, & Widaman, 2002); the same strategy was used to create parcels for maladaptive ways.

The structural models and fit indices are presented in Figure 2. Despite CFIs that averaged .86 and so were slightly lower than conventional criteria of .90, we considered the fits of both models at both time points to be satisfactory. Values for the standardized root mean square residuals (SRMRs) and root mean square errors of approximation (RMSEAs) for all models were excellent, with tight confidence intervals (Brown & Cudeck, 1992; Hu & Bentler, 1999). Kenny (2013) argues that incremental measures of fit (e.g., CFI) may be significantly underestimated for models in which the RMSEA for the null model is less than 0.158, which is true for all of our models. In such cases, the absolute fit indices (e.g., the RMSEA) provide more accurate information about model fit. Note that one hypothesized path was not found: The link between Emotional Reactivity and Maladaptive Coping was not significant. In addition, the link between Engagement and Emotional Reactivity, although significant and in the predicted direction (i.e., negative), was not as strong as the other links in the model. These

unexpected findings were replicated in models from both fall and spring.

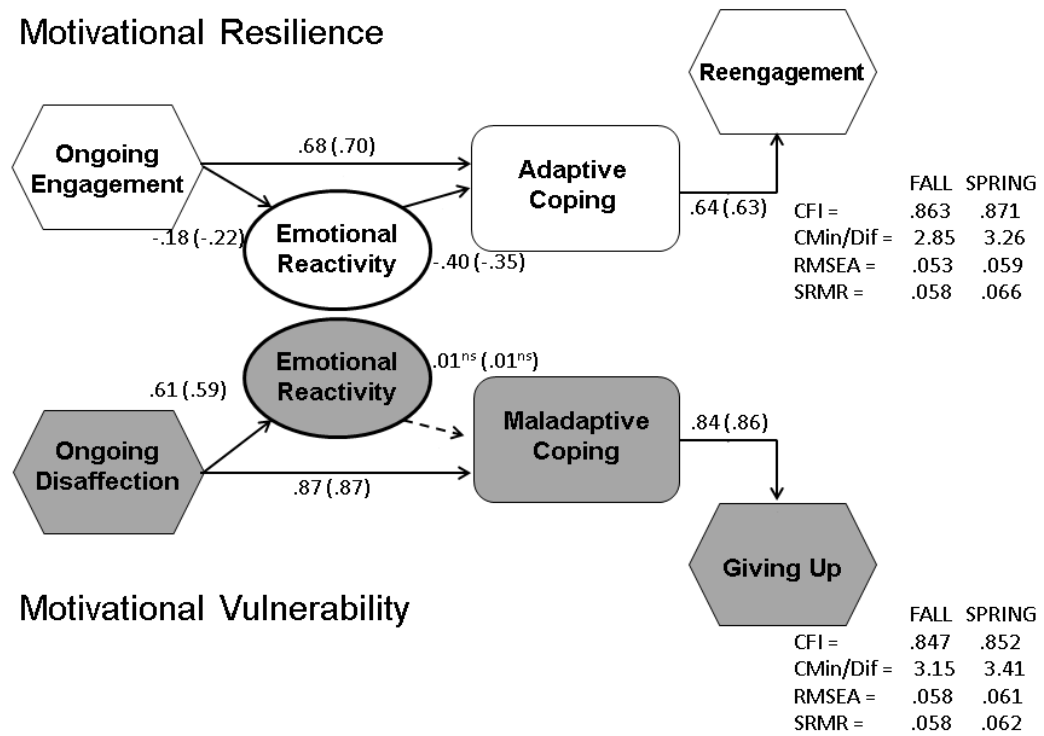


Figure 2. Structural equation models of the steps in the model of motivational resilience using data from fall and spring, using allocation scores for adaptive and maladaptive ways of coping separately. Standardized coefficients for fall are above the arrows, for spring are in parentheses. Solid lines are predicted paths; dashed lines are predicted paths that were not found.

Functional Models of Each Step in the Process

Of greatest interest were analyses designed to examine whether measures tapping each step in the process model predicted *changes* in the subsequent step. In all tables depicting the results of these analyses, the predictor variable in the fall (i.e., step_n) appears in the left-hand column; in the column headers are the dependent variables; these are *changes* in the next step (i.e., step_{n+1}), calculated as the dependent variable in spring controlling for that variable in fall.

Step 1a: Engagement to adaptive and maladaptive coping. For analyses examining the first step in the model, namely, from engagement to adaptive and maladaptive coping, Engagement in the fall (i.e., step_n) was a predictor of changes in each of the five adaptive and six maladaptive ways of coping from fall to spring (i.e., step_{n+1}). Despite strong cross-year stabilities, Engagement was a significant predictor of changes in all adaptive ways, especially Strategizing and Commitment, indicating that students who were more engaged at the beginning of the school year were more likely to increase their use of adaptive strategies as the year progressed. At the same time, Engagement was generally not as strong a predictor of changes in maladaptive coping. However, it did significantly predict decreases in all the maladaptive ways, suggesting that Engagement acted as a mild protective factor: Students who were more engaged when the school year began were somewhat less likely to fall back on maladaptive strategies, especially Projection (blaming the teacher), as the year continued.

Table 5

Multiple Regressions in which Engagement, Disaffection, and Emotional Reactivity in Fall Each Individually Predicts

Changes in Allocation Scores for Five Adaptive and Six Maladaptive Ways of Coping from Fall to Spring

Changes from Fall to Spring in Five Ways of Adaptive Coping

<i>Predictor in Fall</i>	Strategizing	Help-seeking	Comfort-seeking	Self-Encourage	Commitment
Engagement	.20	.10**	.10**	.11**	.18
Disaffection	-.29	-.21	-.08*	-.20	-.29
Emotional Reactivity	-.20	-.11**	-.12**	-.16	-.14

Changes from Fall to Spring in Six Ways of Maladaptive Coping

<i>Predictor in Fall</i>	Confusion	Escape	Concealment	Self-Pity	Rumination	Projection
Engagement	-.09*	-.12**	-.12**	-.09*	-.07*	-.19
Disaffection	.19	.13**	.19	.24	.09*	.18
Emotional Reactivity	.18	.04 ^{ns}	.15	.14	.19	.02 ^{ns}

Note. N = 650 students in grades three through five. All regressions are significant at $p < .001$ except as noted.

** $p < .01$. * $p < .05$. ^{ns} $p < .10$. ^{ns} = not significant.

Step 1b: Disaffection to adaptive and maladaptive coping. Table 5 also contains the results of multiple regressions in which the predictor was Disaffection, and the dependent variables focused on changes in adaptive and maladaptive ways of coping. As hypothesized, Disaffection was consistently a negative and significant predictor of changes in adaptive coping, especially Strategizing and Commitment, indicating that students who started the school year relatively disaffected, were more likely to decrease in their use of adaptive strategies as the year progressed. Moreover, Disaffection was a relatively strong predictor of increased reliance on all of the maladaptive ways of coping, especially Self-pity and Confusion, indicating that disaffected students were also increasingly more likely to fall back on maladaptive responses as the year progressed.

Step 2: Engagement and disaffection to emotional reactivity. In the next set of analyses, multiple regressions used either Engagement or Disaffection as the predictor, and the dependent variable was changes in Emotional Reactivity. Disaffection was the only significant predictor of increases in Emotional Reactivity ($\beta = .09, p < .05$); Engagement was not ($\beta = -.01, ns$). As presaged by the low concurrent correlations between Engagement and Emotional Reactivity and the low coefficients in the structural models, it seemed that engagement could not foretell who would become distressed when they encountered academic difficulties. At the same time, students who were more disaffected at the beginning of the school year were likely to show increases in the distress they experienced in the face of failures and setbacks as the year progressed.

Step 3: Emotional reactivity to coping. Table 5 also contains the results of multiple regressions in which emotional reactivity was considered step_n and coping was considered step_{n+1} . Each row contains the standardized coefficients showing how well Emotional Reactivity in fall predicted changes in each way of coping from fall to spring. In general, Emotional Reactivity predicted decreases in all of the adaptive ways of coping and corresponding increases in most of the maladaptive ways. However, Emotional Reactivity did not predict increases in Escape or Projection over the school year.

Step 4: Coping to re-engagement. The set of regressions examining coping as step_n and re-engagement as step_{n+1} are depicted in Table 6. Each way of coping and the profiles in fall were individually used as predictors of changes in Re-engagement and Giving Up from fall to spring. Overall, despite the high stabilities of Re-engagement ($r = .46$) and Giving Up ($r = .57$), adaptive ways predicted increases in Re-engagement, and decreases in Giving Up. Although, in general, the coefficients were not large, the most important predictors of increases in Re-engagement were Self-encouragement and Comfort Seeking, which also provided some protection against Giving Up. Surprisingly, Strategizing and Commitment did not predict increases in Re-engagement, although they were significant predictors of decreases in Giving Up. These findings indicate that students whose coping repertoires focused on adaptive strategies at the beginning of the year were increasingly likely to persist in the face of problems and setbacks as the year continued.

Table 6

Multiple Regressions in which Ways of Coping in the Fall predict Changes in Re-engagement and Giving Up on Challenging Academic Tasks from Fall to Spring.

<i>Predictor in Fall</i>	<i>Changes from Fall to Spring in</i>	
	Re-engagement	Giving Up
<i>Adaptive Coping</i>		
Strategizing	$\beta = .06^{ns}$	$\beta = -.15$
Help-seeking	$\beta = .07^{\wedge}$	$\beta = -.12^{**}$
Comfort-seeking	$\beta = .10^{**}$	$\beta = -.18$
Self-Encouragement	$\beta = .10^{**}$	$\beta = -.15$
Commitment	$\beta = .05^{ns}$	$\beta = -.12^{**}$
Total Adaptive	$\beta = .13^{**}$	$\beta = -.28$
<i>Maladaptive Coping</i>		
Confusion	$\beta = -.01^{ns}$	$\beta = .13$
Escape	$\beta = -.07^{\wedge}$	$\beta = .06^{\wedge}$
Concealment	$\beta = -.12^{**}$	$\beta = .12$
Self-Pity	$\beta = -.07^{*}$	$\beta = .22$
Rumination	$\beta = -.03^{ns}$	$\beta = .00^{ns}$
Projection	$\beta = -.16$	$\beta = .20$
Total maladaptive	$\beta = -.13^{**}$	$\beta = .28$
Coping Profile	$\beta = -.14^{**}$	$\beta = .25$

Note. $N = 650$ students in grades three through five. All regressions are significant at $p < .001$ except as noted. $** p < .01$. $* p < .05$. $^{\wedge} p < .10$. ns = not significant.

As expected, the maladaptive ways of coping generally predicted decreases in Re-engagement and increases in Giving Up; Projection was a strong predictor of both. Surprisingly, however, Rumination was not a significant predictor of changes in either outcome, suggesting that continuing to think about the academic stressor did not interfere with re-engagement or make giving up more likely. Finally, Confusion did not predict decreases in Re-engagement, although it was a significant predictor of increases in Giving Up. Taken together, findings indicate that students whose initial coping relied on maladaptive reactions to problems were increasingly likely to stop trying when faced with academic stressors as the year continued.

Step 5: Re-engagement to engagement and disaffection. Finally, four regression equations were calculated to examine the last feedback loop in the process model: Re-engagement in fall as step_n and Engagement as step_{n+1}. Despite the high stabilities of Engagement ($r = .59$) and Disaffection ($r = .62$), all four regressions were significant: Increases in Engagement over the school year were predicted by high levels of Re-engagement ($\beta = .12, p < .01$) and low levels of Giving Up ($\beta = -.11, p < .01$) in the fall; and increases in Disaffection over the school year were predicted by initial high levels of Giving Up ($\beta = .11, p < .01$) and low levels of Re-engagement ($\beta = -.09, p < .01$).

Discussion

This study was designed to examine the structural and functional features of a multi-step process model of motivational resilience and vulnerability. Correlational and

structural analyses which simultaneously examined all the links in the model supported the notion of strong concurrent connections among the markers of motivational resilience (i.e., engagement, adaptive coping, and re-engagement) as well as among the markers of motivational vulnerability (i.e., disaffection, emotional reactivity, maladaptive coping, and giving up). Of greatest interest were functional analyses, which examined whether measures of each step in the model collected at the beginning of the school year could predict *changes* in the next step from fall to spring.

In general, support was found for all but one step, namely, the one from engagement to reactivity: Engagement provided no protection against the experience of distress when students encountered academic problems and setbacks. Nevertheless, Engagement did seem to offer energetic resources for coping itself: Engagement in fall predicted increasing use of adaptive ways of coping and decreasing reliance on maladaptive strategies as the year continued. In turn, students whose initial repertoire of coping focused on adaptive reactions were increasingly likely to persevere and not to abandon challenging academic tasks. Specifically, the use of all of the adaptive strategies in fall predicted decreases in Giving Up, and two of them (Self-encouragement and Comfort-seeking) predicted increases in Re-engagement from fall to spring. High levels of Re-engagement, in turn, predicted increases in students' subsequent Engagement and decreases in Disaffection, completing the cycle of motivational resilience.

The prognosis for students who started the school year high in disaffection was

very different. High Disaffection predicted not only increasing emotional reactivity, but also increased reliance on each maladaptive way of coping. Emotional reactivity itself also predicted increases in all the maladaptive ways of coping (except Escape and Projection). At the same time, high Disaffection and Emotional Reactivity in fall were risk factors for losses over the school year in all the strategies for coping adaptively with academic problems. In turn, such a profile of coping (high maladaptive and low adaptive) seemed to act as a motivational liability, reducing Re-engagement and making children more likely to give up when they encountered academic stressors. All the maladaptive ways of coping in fall, except Rumination, predicted increases in Giving Up. And Projection, Concealment, and Self-pity also predicted declines in Re-engagement. Finally, completing the cycle of motivational vulnerability, high levels of Giving Up in fall predicted losses in Engagement and increasing Disaffection over the school year.

Limitations of the Current Study

Before the findings are interpreted, the study's limitations should be considered. First, the study's generalizability is limited by the participants' demographics: They were largely Caucasian middle and working class students. However, the examination of protective processes such as those considered in the current study, are of special importance for students from low socio-economic status, racial and ethnic minority, or immigrant groups, who are not only at-risk for academic underachievement, but also face the stresses associated with poverty and discrimination (Spencer, 2006; Tolan &

Grant, 2009).

Second, the study's measures showed several limitations. Internal consistency reliabilities for several of the coping subscales and for re-engagement were relatively low. Measurement was also limited by the fact that all assessments were based on student self-reports. Although some constructs, such as coping, may include internal thoughts and feelings that are accessible only to students, constructs such as engagement and re-engagement are observable (Skinner et al., 2009), and future studies would profit from including information provided by teachers and observers. Finally, the current study was limited by its design. It would be important to supplement the current descriptive study, which identified "causal candidates," with experimental or intervention studies that can provide conclusive evidence about causal influences.

Implications and Future Studies

In general, this study's results provided supporting evidence for the proposed model of motivational resilience. Most interesting, of course, were unexpected findings, such as the steps for which no or low support was found, and findings suggesting differential participation of certain ways of coping in some of the steps. These more specific issues are discussed before considering the overall dynamics implied by the results taken as a whole.

Engagement, emotional reactivity, and re-engagement. There was only one step in the model for which no support was found: High levels of engagement did not protect students from distress when they ran into academic difficulties. One possible

explanation is that emotional reactivity contains not only feelings of distress (which engagement should buffer) but also the seeds of caring about performance in school (which engagement would promote). It is important to note, however, that emotional reactivity is not a neutral state. It predicted decreases in adaptive coping, especially those strategies most closely connected to re-engagement, and boosted maladaptive coping. Perhaps future studies can take a person-centered approach, and distinguish engaged students who are highly reactive from those who show relative equanimity. These two groups may also show different patterns of coping and re-engagement over time.

Differentiated role of specific adaptive and maladaptive ways of coping. The model of motivational resilience, as depicted in Figure 1, treats adaptive and maladaptive ways of coping as a profile, or repertoire, of beneficial versus detrimental strategies for dealing with academic problems. And indeed, all the adaptive ways of coping were consistently connected to other markers of motivational resilience (engagement and re-engagement) while all the maladaptive ways were connected to other markers of vulnerability (disaffection, emotional reactivity, and giving up). However, a closer examination of the pattern of cross-time predictions involving specific ways of coping reveals some differentiation in the role each plays in the process. These are summarized in Table 9. Especially interesting were differences among the maladaptive ways of coping in their connections to motivation and emotion.

Table 7

Summary of the Findings on the Role of Each Way of Coping in the Internal Dynamics of Motivational Resilience, in Order of Reported Usage.

Adaptive Ways of Coping

1. *Strategizing*: Most common way of coping (along with Help-seeking). Increases strongly predicted by Engagement, and decreases strongly predicted by Disaffection and Emotional Reactivity. Moderate predictor of increases in Re-engagement and strong predictor of decreases in Giving Up.
2. *Help-seeking*: Most common way of coping (along with Strategizing). Increases moderately predicted by Engagement, and decreases strongly predicted by Disaffection and Emotional Reactivity. Moderate predictor of increases in Re-engagement and strong predictor of decreases in Giving Up.
3. *Self-encouragement*: Second line of defense (after Strategizing and Help-seeking). Increases moderately predicted by Engagement, and decreases strongly predicted by Disaffection and Emotional Reactivity. Moderate predictor of increases in Re-engagement and strong predictor of decreases in Giving Up.
4. *Commitment*: Third line of defense (along with Comfort-seeking). Increases moderately predicted by Engagement, and decreases strongly predicted by Disaffection and Emotional Reactivity. Not a significant predictor of Re-engagement but a strong predictor of decreases in Giving Up.
5. *Comfort-seeking*: Third line of defense (along with Commitment). Increases moderately predicted by Engagement, and decreases moderately predicted by Disaffection and Emotional Reactivity. Moderate predictor of increases in Re-engagement and strong predictor of decreases in Giving Up.

Maladaptive Ways of Coping

6. *Rumination*: Most common maladaptive way of coping. Not predicted by Engagement; increases moderately predicted by Disaffection, strongly predicted by Emotional Reactivity. Not a significant predictor of changes in either Re-engagement or Giving Up.
7. *Confusion*: Second most common maladaptive way of coping. Decreases moderately predicted by Engagement, and increases strongly predicted by Disaffection and Emotional Reactivity. Not a predictor of changes in Re-engagement but a strong predictor of increases in Giving Up.
8. *Self-pity*: Third most common maladaptive way of coping (along with Concealment and Escape). Decreases moderately predicted by Engagement, and increases strongly predicted by Disaffection and moderately by Emotional Reactivity. Not a predictor of changes in Re-engagement but a strong predictor of increases in Giving Up.
9. *Concealment*: Third most common maladaptive way of coping (along with Self-pity and Escape). Decreases moderately predicted by Engagement, and increases strongly predicted by Disaffection and Emotional Reactivity. Moderate predictor of decreases in Re-engagement and increases in Giving Up.
10. *Escape*: Third most common maladaptive way of coping (along with Self-pity and Concealment). Decreases moderately predicted by Engagement, and increases strongly predicted by Disaffection and Emotional Reactivity. Moderate predictor of decreases in Re-engagement but not a predictor of changes in Giving Up.
11. *Projection*: Least common way of coping. Decreases strongly predicted by Engagement, and increases strongly predicted by Disaffection; changes not predicted by Emotional Reactivity. Strong predictor of decreases in Re-engagement and increases in Giving Up.

Dynamics of motivational resilience. Taken together, these findings suggest that students' engagement, adaptive coping, and persistence could form cycles that consolidate or augment motivational resilience over time, just as students' disaffection, emotional reactivity, maladaptive coping, and giving up could form cycles that perpetuate or amplify their motivational vulnerability. It is noteworthy that all these behavioral and emotional links are in place by late elementary school, even in this generally high functioning sample. Such dynamics may underlie motivational development as well as help to explain the stability of students' trajectories of engagement and disaffection as they finish elementary school and begin junior high and high school (Marks, 2000).

The formation of virtuous cycles should be a goal of educational interventions early in elementary school, in tandem with the prevention or reversal of cycles of disaffection. Each of the components of the motivational model can in principle serve as a potential "lever" to adjust the whole system, but additional research would be helpful to identify the most malleable factors that produce the biggest salutary effects. Based only on the regression coefficients, disaffection seems to be the most powerful predictor of changes in subsequent coping, both adaptive and maladaptive, so it might be important to tune intervention efforts so that they not only promote engagement, but also intentionally prevent disaffection from taking root. Such work should further our efforts to foster students' long-term motivational resilience and success in school.

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Appendix B

Measures

Context: Measures of Teacher Support

Warmth vs. Rejection

Student-report (16 items)

<i>Time Spent</i>	My teacher spends time with me. My teacher talks with me.
<i>Affection</i>	My teacher likes me. My teacher really cares about me. My teacher doesn't seem to enjoy having me in her class.
<i>Availability</i>	My teacher is always there for me. My teacher is never there for me. My teacher never seems to be around for me.
<i>Knowledge</i>	My teacher knows me well. My teacher just doesn't understand me. My teacher doesn't know very much about what goes on for me outside of school.
<i>Dependability</i>	I can count on my teacher to be there for me. I can rely on my teacher to be there when I need him/her. I can't depend on my teacher for important things. I can't count on my teacher when I need him/her. I can't rely on my teacher when I really need him/her.

Structure vs. Chaos

Student-report (29 items)

<i>Contingency</i>	When I do something right, my teacher always lets me know. My teacher treats me fairly. When my teacher tells me he/she will do something I know he/she will do it. I know what to expect from my teacher when I make a mistake. My teacher doesn't treat me like everyone else when I break the rules. Every time I do something wrong, my teacher acts differently. When I break the rules, I never know how my teacher will react. My teacher keeps changing how he/she acts towards me.
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<i>Expectations</i>	<p>My teacher makes it clear what he/she expects of me in school.</p> <p>I know what my teacher expects of me in class.</p> <p>My teacher tells me what he/she expects of me in school.</p> <p>My teacher keeps changing the rules in our class.</p> <p>I don't know what my teacher wants me to do in class.</p> <p>My teacher doesn't make it clear what she expects of me in class.</p> <p>My teacher doesn't tell me what he/she expects of me in school.</p>
<i>Help/Support</i>	<p>My teacher doesn't help me, even when I need it.</p> <p>Even when I run into problems, my teacher doesn't help me.</p> <p>My teacher doesn't seem to know when I need help.</p> <p>When I can't understand something in class, my teacher explains it a lot of different ways.</p> <p>My teacher shows me how to solve problems for myself.</p> <p>If I can't solve a problem, my teacher shows me different ways to try to.</p>
<i>Adjustment/Monitoring</i>	<p>My teacher doesn't go on to new things before he/she knows that I understand the old ones.</p> <p>My teacher makes sure I understand before he/she goes on.</p> <p>My teacher makes sure that he/she doesn't teach faster than I can learn.</p> <p>My teacher checks to see if I'm ready before he/she starts a new topic.</p> <p>My teacher begins new things before he/she makes sure I've learned the old ones.</p> <p>My teacher doesn't check to see if I'm keeping up with him/her.</p> <p>My teacher doesn't know when I'm ready to go on.</p> <p>My teacher doesn't check to see if I understand before he/she goes on.</p>

Autonomy Support vs. Coercion

Student-report (21 items)

Choice My teacher gives me a lot of choices about how I do my schoolwork.
 When it comes to assignments, my teacher gives me all kinds of things to choose from.
 My teacher doesn't give me a chance to choose anything about my classwork.
 My teacher doesn't give me many choices when it comes to doing assignments.

Control My teacher is always getting on my case about schoolwork.
 My teacher tries to control everything I do.
 It seems like my teacher is always telling me what to do.
 My teacher makes me do everything his/her way.

Respect My teacher lets me decide things for myself.
 My teacher encourages me to do things my own way.
 My teacher listens to my ideas.
 My teacher interrupts me when I have something to say.
 My teacher doesn't encourage me to do things my own way.
 My teacher doesn't listen to my opinion.
 My teacher never listens to my side.

Relevance My teacher talks about how I can use the things we learn in school.
 My teacher talks to me about whether school is useful.
 My teacher encourages me to find out how schoolwork could be useful to me.
 My teacher doesn't explain why what I do in school is important to me.
 My teacher doesn't explain why we have to learn certain things in school.
 My teacher never talks about how I can use the things we learn in school.

Self: Measures of self-system processes and catastrophizing appraisals

Self-System Processes

Relatedness

Student-report (20 items)

- When I'm with my mother, I feel accepted.
 - When I'm with my mother, I feel like someone special.
 - When I'm with my mother, I feel ignored.
 - When I'm with my mother, I feel unimportant.
 - When I'm with my father, I feel accepted.
 - When I'm with my father, I feel like someone special.
 - When I'm with my father, I feel ignored.
 - When I'm with my father, I feel unimportant.
 - When I'm with my teacher, I feel accepted.
 - When I'm with my teacher, I feel like someone special.
 - When I'm with my teacher, I feel ignored.
 - When I'm with my teacher, I feel unimportant.
 - When I'm with my classmates, I feel accepted.
 - When I'm with my classmates, I feel like I belong.
 - When I'm with my classmates, I feel left out.
 - When I'm with my classmates, I feel unimportant.
 - When I'm with my friends, I feel like I belong.
 - When I'm with my friends, I feel accepted.
 - When I'm with my friends, I feel unimportant.
 - When I'm with my friends, I feel left out.
-

Competence

Student-report (27 items)

- Control* If I decide to learn something hard, I can.
 - I can do well in school if I want to.
 - I can get good grades in school.
 - I can't get good grades no matter what I do.
 - I can't stop myself from doing poorly in school.
 - I can't do well in school, even if I want to.
-

- Effort as Strategy* If I want to do well on my schoolwork, I just need to try hard.
 - The best way for me to get good grades is to work hard.
 - If I don't do well in school, it's because I didn't work hard enough.
 - If I get bad grades, it's because I didn't try hard enough.
 - If I don't do well on my schoolwork, it's because I didn't try hard enough.
-

<i>Effort as Capacity</i>	<p>When I'm in class, I can work hard. I can work really hard in school. When I'm doing classwork, I can really work hard on it. I can't seem to try very hard in school. When I'm in class, I can't seem to work very hard. I have trouble working hard in school.</p>
<i>Ability as Capacity</i>	<p>I think I'm pretty smart in school. When it comes to school, I'm pretty smart. I would say I'm pretty smart in school. I don't have the brains to do well at school. I'm not very smart when it comes to schoolwork. When it comes to schoolwork, I don't think I'm very smart.</p>
<i>Means-Ends Unknown</i>	<p>When I do well in school, I usually can't figure out why. I don't know what it takes for me to get good grades in school. When I do badly in school, I usually can't figure out why. I don't know how to keep myself from getting bad grades.</p>

Autonomy

Student-report (17 items)

<i>External</i>	<p>Why do I do my homework? Because I'll get in trouble if I don't. Why do I work on my classwork? So that the teacher won't yell at me. Why do I work on my classwork? Because that's the rule. Why do I work on my classwork? Because the teacher says we have to.</p>
<i>Introjected</i>	<p>Why do I do my homework? Because I'll feel bad about myself if I don't do it. Why do I work on my classwork? Because I'll be ashamed of myself if it doesn't get done. Why do I try to do well in school? Because I'll feel really bad about myself if I don't do well. Why do I try to do well in school? Because I feel guilty when I don't do as well as I should.</p>
<i>Identified</i>	<p>Why do I do my homework? Because I want to understand the subject. Why do I do my classwork? Because I want to learn new things.</p>

Why do I work on my classwork? Because I think classwork is important for my learning.
 Why do I try to do well in school? Because I enjoy doing schoolwork well.
 Why do I try to do well in school? Because doing well in school is important to me.

Intrinsic Why do I do my homework? Because it's fun.
 Why do I do my homework? Because I enjoy doing my homework.
 Why do I work on my classwork? Because it's fun.
 Why do I work on my classwork? Because I enjoy doing my classwork.

Catastrophizing Appraisals

Catastrophizing of Relatedness

Student-report (9 items)

When something bad happens to me in school (like not doing well on a test or not being able to answer an important question in class),

I feel like nobody will have anything to do with me.
 I feel like nobody will like me.
 I feel like nobody will care about me.
 I feel like no one will like me as much.

When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),

I feel like I let everybody down.
 I feel like I disappointed everybody.
 I feel like I didn't come through for people.
 I feel like I failed everybody.
 I feel worthless.

Catastrophizing of Competence

Student-report (9 items)

When something bad happens to me in school (like not doing well on a test or not being able to answer an important question in class),

I worry that I will miss other problems too.
 I worry about what will happen next time.
 I worry that I won't do well on anything.
 I worry that I'll never learn how to do it.

When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),

- I feel totally stupid.
- I feel like the dumbest person in the world.
- I feel like an idiot.
- I feel totally incompetent.
- I feel really dumb.

Catastrophizing of Autonomy

Student-report (9 items)

When I have trouble with a subject in school,

- It's never the same for me again.
- I'm never as interested in that subject.
- I don't care as much about the subject anymore.
- It really spoils the subject for me.

When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),

- I feel like I should never have let this happen.
- I feel like it's all my fault.
- I feel like I'm a bad person.
- I feel like I'm to blame.
- I feel like yelling at myself.

Action: Measures of Motivational Resilience

Engagement vs. Disaffection

Student-report (25 items)

Behavioral Engagement

- I participate when we discuss new material.
- I work hard when we start something new in class.
- The first time my teacher talks about a new topic, I listen very carefully.
- I try very hard in school.
- I participate in class discussions.

Emotional Engagement

- When we start something new in school, I feel interested.
- When my teacher first explains new material, I feel relaxed.
- When I'm working on my classwork, I feel relaxed.
- When I'm working on my classwork, I feel involved.
- When I'm in class, I feel good.
- When I'm in school, I feel happy.

<i>Behavioral Disaffection</i>	<p>When we start something new, I practically fall asleep. My mind wanders when my teacher starts a new topic. I never seem to pay attention when we begin a new subject. When I'm in class, I just act like I'm working. In class, I try to do just enough to get by.</p>
<i>Emotional Disaffection</i>	<p>When we start something new in school, I feel worried. When my teacher first explains new material, I feel bored. When I'm working on my classwork, I feel nervous. When I'm working on my classwork, I feel mad. When I'm doing my work in class, I feel worried. When I'm doing my work in class, I feel bored. When I'm in class, I feel sad. When I'm in school, I feel bad. When I'm in school, I feel terrible.</p>

Engagement vs. Disaffection

Teacher-report (13 items)	
<i>Behavioral Engagement</i>	<p>In my class, this student works as hard as he/she can. When we start something new in class, this student participates in discussion.</p>
<i>Emotional Engagement</i>	<p>In my class, this student appears enthusiastic. In my class, this student appears happy. When I explain new material, this student seems relaxed.</p>
<i>Behavioral Disaffection</i>	<p>In my class, this student does just enough to get by. In my class, this student comes unprepared. When we start something new in class, this student doesn't pay attention. When we start something new in class, this student thinks about other things.</p>
<i>Emotional Disaffection</i>	<p>When I explain new material, this student seems bored. In my class, this student appears anxious. In my class, this student appears angry. In my class, this student appears depressed.</p>

Emotional Reactivity

Student-report (11 items)

When I get stuck on a problem, it really bothers me.
 When something bad happens in school, it really gets me.
 I get really upset when something bad happens in school.

When something bad happens in school (like doing badly on a test, or having trouble learning something):

I feel frustrated.
 I feel bad.
 I feel angry.
 I feel sad.
 I feel terrible.

When I can't solve a problem or question in class,

I feel anxious.
 I feel mad.
 I feel worried.

Academic Coping

Student-report (55 items)

Adaptive

When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),

Strategizing

I try to figure out what I did wrong so that it won't happen again.
 I try to see what I did wrong.
 I think about some way to keep this from happening again.
 I try to figure out how to do better next time.
 I think of some things that will help me next time.

When I have trouble with a subject in school,

Help-Seeking

I ask for some help with understanding the material.
 I get some help to understand the material better.
 I ask the teacher to go over it with me.
 I ask the teacher to explain what I didn't understand.
 I get some help on the parts I didn't understand.

<i>Comfort-Seeking</i>	<p>When something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I talk about it with someone who will make me feel better. I spend time with someone who will cheer me up. I talk about it with someone I'm close to. I discuss it with someone who will help me feel better about it. I talk with someone who will keep me from feeling bad about it.</p>
<i>Self-Encouragement</i>	<p>When I run into a problem on an important test, I think about the times I did it right. I tell myself it's not so bad to make a mistake. I tell myself I'll do better next time. I tell myself I'll have another chance. I tell myself it'll be okay.</p>
<i>Commitment</i>	<p>When I have difficulty learning something, I think about all the reasons it's important to me. I remind myself that it's worth it to me in the long run. I remind myself that this is important in reaching my own goals. I remind myself that it's something that I really want to do. I think about how this is important for my own personal goals.</p>
Maladaptive	
<i>Confusion</i>	<p>When I run into a problem on an important test, I'm not sure what to do next. I can't remember what to do. My mind goes blank. I get all confused. It's difficult for me to think.</p>

<i>Escape</i>	<p>When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),</p> <p>I quit thinking about it. I tell myself it's not such a big deal. I tell myself it didn't matter. I say it wasn't important. I say I didn't care about it.</p>
<i>Concealment</i>	<p>When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),</p> <p>I try to keep people from finding out. I make sure nobody finds out. I try to hide it. I don't tell anyone about it. I don't let anybody know about it.</p>
<i>Self-Pity</i>	<p>When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),</p> <p>I think about all the times this happens to me. I say, "This always happens to me." I ask myself "Why is this always happening to me?" I say "Here we go again." I can't believe this is always happening to me.</p>
<i>Rumination</i>	<p>When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),</p> <p>I just can't stop thinking about it. I keep thinking about it over and over. I think about it all the time. I'm always thinking about it afterwards. I can't get it out of my head.</p>
<i>Projection</i>	<p>When I run into a problem on an important test,</p> <p>I say it was the teacher's fault. I say the teacher didn't tell us the right thing to study. I say the teacher isn't fair. I say the test was too hard. I say the test was not fair.</p>

Re-engagement vs. Giving Up

Student-report (9 items)

<i>Re-engagement</i>	<p>If a problem is really hard, I keep working at it.</p> <p>When I run into a difficult question, I try even harder.</p> <p>If I can't get a problem right the first time, I just keep trying.</p> <p>When I do badly on a test, I work harder the next time.</p>
<i>Giving Up</i>	<p>When I have a hard question or problem in class, I don't even try.</p> <p>When I come to a problem that I can't solve right away, I just give up.</p> <p>If a problem is really hard, I just quit working on it.</p> <p>If I don't understand something right away, I stop trying.</p> <p>When I have trouble understanding something, I give up.</p>

Re-engagement vs. Giving Up

Teacher-report (3 items)

<i>Re-engagement</i>	When this student doesn't do well on a test or assignment in my class, she/he works harder the next time.
<i>Giving Up</i>	<p>When faced with a difficult problem or assignment in my class, this student gives up quickly.</p> <p>When faced with a difficult problem or assignment in my class, this student doesn't even try.</p>