ABSTRACT

Title of dissertation:            COORDINATING SCHOOL GOALS: A PROCESS

                                  MODEL OF MULTIPLE GOAL PURSUIT


                                  Sandra Ann Baker, Doctor of Philosophy, 2015


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The social and academic goals students pursue in the classroom are important predictors

of academic performance, particularly during the middle school years. Several

motivational constructs, including self-regulation efficacy, have also been positively

related to the goals students pursue in the classroom and academic performance. The role

of multiple goal coordination (perceptions of inter-goal interference and facilitation) in

predicting academic performance, however, has not been readily addressed. Goals are

considered to interfere with one another when the pursuit of one goal conflicts with the

pursuit of a second goal. Perceptions of inter-goal facilitation, on the other hand, occur

when one goal is seen as beneficial to the pursuit of a second goal. The combined

influence of these constructs in predicting academic achievement has not been explored.

The purpose of the current study was to test a process model of multiple goal coordination that examined middle school students' self-regulation efficacy, multiple goals and perceptions of inter-goal interference and facilitation in relation to academic performance (GPA). Responses from sixth ($n = 293$), seventh ($n = 226$), and eighth ($n = 146$) grade students from two racially diverse low-income school districts in the Southeastern U.S. indicated that self-regulation efficacy was a positive predictor of multiple goal pursuit. Students' multiple goals, in turn, mediated the relation between self-regulation efficacy and academic performance. Academic and social responsibility goals, in particular, were found to be important predictors of academic performance above and beyond levels of self-regulation efficacy. In addition, students' perceptions of inter-goal interference were negative predictors, and perceptions of inter-goal facilitation were positive predictors, of academic performance. Finally, results indicated that perceptions of inter-goal interference moderated the relation between self-regulation efficacy and academic performance (moderated mediation). If students perceived pursuit of one goal to interfere with the pursuit of a second goal, academic performance was lower regardless of levels of self-regulation efficacy. Findings provide evidence for a more complex model of multiple goal pursuit; one that includes both self-processes (self-regulation efficacy) and aspects of goal coordination (perceptions of inter-goal interference and facilitation) as factors that impact the relation between multiple goal pursuit and academic performance. Results also suggest that a measure of inter-goal relations can be a useful tool in examining motivational processes in young adolescent student samples.

COORDINATING SCHOOL GOALS: A PROCESS MODEL OF MULTIPLE GOAL

PURSUIT



by



Sandra Ann Baker



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Dedication

This dissertation is dedicated to my parents and family for their unrelenting support

throughout this process, and for helping me have faith that this day would come.

Thank you, thank you, thank you!

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**Chapter 1: Introduction**

Goals are defined as cognitive representations of what an individual seeks to achieve in a given situation (e.g., Bandura, 1986; Ford, 1985; Wentzel, 2000). In the classroom, these cognitions direct student behavior toward specific outcomes (Wentzel, 2000, 2004, 2013). Both Wentzel (1989) and Witkow (2009) found that high-achieving students pursue both academic (e.g., to learn, to perform well) and positive social goals (e.g., to follow rules, to help, to share or cooperate) in school.

One explanation for the positive effects of social and academic goals on academic performance, is that a certain level of social competence is necessary for academic achievement (Wentzel, 2004). Certain types of social aims (e.g., behaving in socially responsible ways) may be especially important for academic performance, in part, because they facilitate learning. For example, the goals of following rules, paying attention, and listening to the teacher are necessary for students to comprehend classroom material. Several researchers have incorporated into their definitions of social and academic competence the concepts of adaptive goal setting and strategizing to coordinate and achieve multiple goals (see Ford, 1992; Rose-Krasnor, 1997; Wentzel, 1993b; 1996). However, researchers have yet to address the processes that may impact the coordination of specific goals and their influence on academic performance. To fill this void, new research is necessary that defines the specific goal combinations students have in school across social and academic domains and provides clarity about how students go about coordinating those goals.

To this end, the current study focused on three main components of the goal coordination process, as they relate to academic performance: self-regulation efficacy,

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multiple goals, and perceptions of inter-goal relations. Inter-goal relations (IGR) refer to the tendency to re-evaluate the pursuit of one goal in light of one's perception of the positive or negative effects of another goal (Riediger, 2001). For example, if students view the pursuit of one goal as beneficial (i.e., mutual facilitation) in relation to a secondary goal, rather than resource depleting (i.e., interference), they are more likely to continue engaging in actions directed toward the attainment of both goals. Indeed, there is evidence that individuals are less likely to engage in goal-directed action when they perceive that there is conflict or interference between their goals (Emmons & King, 1988; Gebhardt, 1997; Gebhardt & Maes, 1998). On the other hand, Riediger and Freund (2004) found a positive relationship between viewing goals as facilitative of one another and multiple goal pursuit.

Self-regulation efficacy also contributes to the goal coordination process. At the broadest level, *self-regulation* refers to the coordination of internal processes intended to initiate, actively guide, and terminate goal-directed behavior. This process includes the regulation of behavior, attention, thought, and affect in a manner that facilitates goal attainment (Bandura, 1986; Karoly, 1993). There is evidence that a relationship exists between the belief in one's ability to regulate one's own behavior (i.e., self-regulation efficacy) and actual behavioral regulation (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Chemers, Martin, Hu, & Garcia, 2001; Shell & Husman, 2008). Efficacy beliefs influence the type of self-regulatory standards students will set and adopt for themselves and affect the effort exerted in pursuit of these standards or goals (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003). The successful coordination of academic and social responsibility goals, in particular, necessitates regulated behavior to engage in goal

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directed actions. For example, achieving the goal of acting responsibly requires students to follow teachers' rules about behavior, including the actions of sitting down quietly or paying attention.

Nevertheless, there is very little empirical research related to goal coordination in the developmental and educational psychology literature that provides theoretical and operational definitions for goal coordination. Instead, many researchers have studied goal conflicts (e.g., Chung & Asher, 1996; Ford, 1985, 1992; Rabiner & Gordon, 1992; Rose & Asher, 1999) or decision-making processes (e.g., Kuhl, 1985) as they relate to the coordination of goals, without a direct operationalization of goal coordination. Some researchers have written chapters related to multiple goal coordination (e.g., Dodge, Asher & Parkhurst, 1989; Wentzel, 1993b), but few empirical studies address what these authors have proposed. For example, Dodge and colleagues (1989) explained how students coordinate their multiple relevant social goals, but described the discussion as "speculative" (p.108), presumably due to a lack of empirical research, which remains an issue more than two decades later.

For the purposes of this study, the term *goal coordination* refers to a process whereby self-regulation efficacy predicts the pursuit of multiple goals; and perceptions concerning the pursuit of these goals (i.e., interference and facilitation), in turn, influence the relationship between self-regulation efficacy and academic performance. In other words, the process involves the determination of whether the pursuit of one goal will aid in (i.e., facilitation) or interfere with the attainment of a second goal. Using this concept, one can test whether seeing goals as facilitative of each other, or interfering and

conflicting with each other, affects the relationship between self-regulation efficacy, having a particular goal set, and academic performance (Wentzel, 2002).

To clarify the relationship between these variables, the present study investigated the relatively unexplored connection between the content of student goals (e.g., academic, social responsibility), perceptions of inter-goal relations, and self-regulation efficacy. The study focused on the idea that to succeed academically, students (a) pursue a variety of goals that facilitate academic performance, (b) view these goals as primarily facilitative of one another, and (c) believe they are capable of regulating their behavior to execute the appropriate actions needed to achieve their goals. The current study extends the literature by addressing the combined and independent effects of the content of students' multiple goals and self-processes on academic performance (Boekaerts, Koning, & Vedder, 2006; Patrick, Hicks, & Ryan, 1997). The following section provides a description of the proposed conceptual model and process model that account for these relationships.

**Conceptual Model**

Figure 1 presents the conceptual model guiding this investigation. An overarching premise of this study was the idea that academic performance was the result of the interaction between several self-processes, including self-regulatory efficacy and perceptions of inter-goal relations. These self-processes relate to the goals students pursue in the classroom, and perceptions of the relationship between these goals, in turn, relate to behavior patterns (Wentzel, Filisetti, & Looney, 2007). Figure 1 depicts a broad conceptual model that encompasses these self-processes and the conceptual social-motivational antecedents to goal pursuit (Wentzel, 2004).
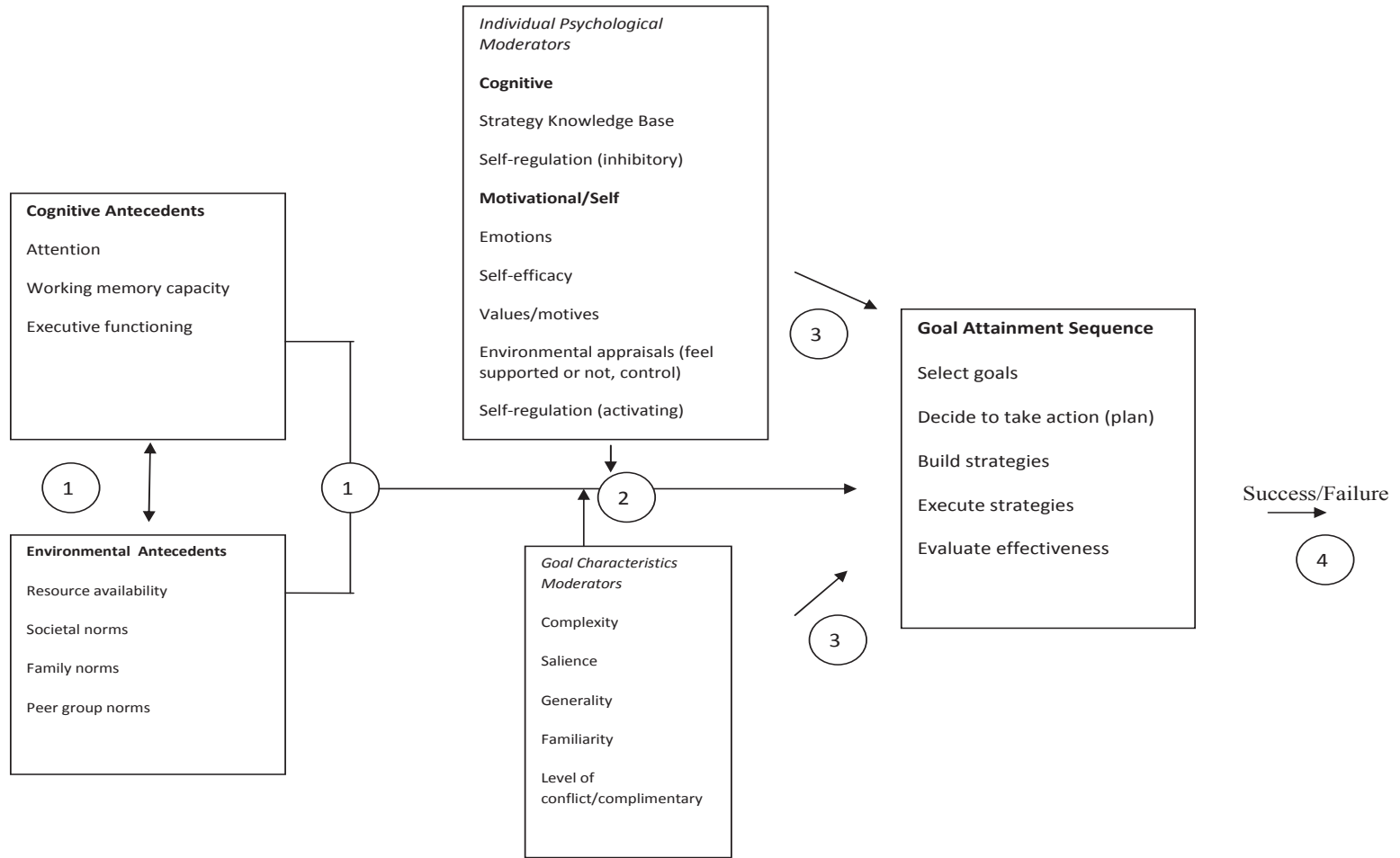
Figure 1. Broad conceptual model.

If goals are cognitive representations of a desirable future state (e.g., Wentzel, 1989, 2004), an individual must engage in behavioral actions and strategies to attain those aims. This process involves the coordination of goals in a way that makes these goals more attainable (Streufert & Nogami, 1997). Bronfenbrener's (1989) ecological systems approach is well suited to address the development of multiple goal coordination skills. This model includes self-factors (i.e., person) as a function of the multiple contexts in which they are embedded, and delineates how these factors interact (i.e., process) to affect successful multiple goal pursuit. Ultimately, this framework helps to expand upon the existing rich qualitative descriptions of students' multiple goals, and brings the study of these related contexts and processes into an empirically testable realm (Ford, 1992).

At the heart of this person x process x context approach lies the idea that there are a set of interactive processes between these three factors that guide the development of academic competence and performance (see Figure 1). The environment for competence development is favorable or unfavorable inasmuch as it affords an individual the opportunity to develop a certain characteristic, or set of characteristics, related to academic success (e.g., Ford, 1992; Wentzel, 2004). As such, the model suggests that there is a systematic nature to development over time, guided by the reciprocal interactions between individuals and their environments, and changes in competence correspond to changes in the existing relationship between a person and their environment (Bronfenbrenner, 1989).

The first path in Figure 1 depicts the conceptual antecedents in the person x process x context ecological systems model (Bronfenbrenner, 1989). There are certain

cognitive and environmental precursors to goal attainment. To begin, an individual must have the cognitive capacity to represent and manipulate information and formulate goals. Individuals must also be able to attend to this relevant information and manage it in real time during the goal-attainment and decision-making process (e.g., working memory or executive functioning; Byrnes, 1998).

The environment places certain constraints on these goal cognitions via socialization processes and affordances (Grolnick, Ryan, & Deci, 1991; Grusec, Goodnow, & Kuczynski, 2000; Wentzel, 2002). At the same time, cognitive capacities dictate the extent to which an individual will attend to, comprehend, and internalize these environmental constraints and affordances (Eccles & Midgley, 1989; Ryan, Connell, & Plant, 1990). This relationship is reciprocal, as the environment also impacts the development of said cognitive capacity (Bronfenbrenner, 1989; Ford, 1992).

Pathway 2 of the model depicts the factors that influence the relationship between cognitive functioning, environmental influences, and goal pursuit (see Figure 1). Namely, there are psychological or self-factors, as well as characteristics of goals in and of themselves, that help to determine the goal an individual selects and the goal-directed behavior the individual activates. Certain skills are necessary to activate these inhibitory or activating processes to attain a desired goal state. An individual must ignore or inhibit distractions from a focal goal (i.e., those goals to which one pays attention and brings into working memory) and control impulses (e.g., pursuing other goals or resisting temptations; Shah & Kruglanski, 2002) that may interfere with goal attainment. These cognitive factors also include motivating forces that encourage individuals to move

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toward a goal systematically. These include problem solving ability, planning, and meta-cognitive strategizing (Byrnes, 1998).

For example, a student might attend to certain cues in the environment that prompt aggressive behavior or lead to the pursuit of anti-social goals (or a lack of pursuit of socially acceptable goals). The student's behavior will reflect this pursuit and could lead to rejection by peers and teachers in the classroom (Crick & Dodge, 1994; Dodge Asher & Parkhurst, 1989; Rabiner & Gordon, 1992). Over time, the student may grow to perceive (or misperceive) the environment as hostile, leading to a focus on, and encoding of, these negative experiences that direct subsequent feelings of inadequacy or other negative self-beliefs (Crick & Dodge, 1994).

One must also account for the emotions that can influence the goals individuals set out to achieve. For example, do negative emotions paralyze individuals or motivate them to pursue their goals (Ilies & Judge, 2005; Verplanken & Holland, 2002)? It is here that self-beliefs, including self-efficacy, manifest their effects. An individual may possess socially acceptable goals, have the knowledge needed to attain these goals, and be in an environment that affords the opportunities necessary to reach the established aims; however, if the individual does not believe she can engage in the behavior necessary to accomplish a goal, it is unlikely she will exert the effort needed to do so (Bandura, 1997; Wentzel, 2004, 2013).

Pathway 3 presents factors related directly to goal-directed behavior (see Figure 1). Everything prior to this point happens completely internally, either directly (e.g., self-beliefs) or indirectly (i.e., as a part of the environment that later gets encoded internally). An individual must now execute a course of action based on strategies, and be able to

evaluate how effective these actions were in attaining established goals. This information then becomes part of her cognitive repertoire, used for future reference in the goal-directed action sequence (Crick & Dodge, 1994; Lansford et al., 2006).

Finally, pathway 4 depicts the individual's success or failure in attaining the goal, which serves as the outcome of this process model. Evaluations of success or failure can significantly alter the goal pursuit process as the cycle repeats itself. Is failure motivating or demotivating? Is it a signal to re-strategize or engage in actions directed to a different goal (e.g., Thacher & Bailis, 2012; Turner, Thorpe, & Meyer, 1998)?

It is important to note that the components depicted in this model do not necessarily have an equal impact on future goal selection and pursuit. However, it is impossible to address every component of this model in a single study. The current study addresses important questions related to specific sub-components presented in the model: Are some processes or factors more essential or influential than others? If so, how are they related?

This researcher set out to test the notion that students who successfully pursue an array of social and academic goals that facilitate academic performance (a) view their goals as facilitative of, rather than interfering with, one another and (b) have the self-regulation efficacy necessary to do so. The first goal of this study was to explore these relationships. The second goal was to determine whether the pursuit of goals explained the relation between self-regulation efficacy and academic performance, and whether perceptions of inter-goal relations moderated the relationship between self-regulation efficacy, multiple goal pursuit, and academic performance. As depicted in Figure 2, the conceptual model used in this investigation includes four interrelated components:

multiple goals, inter-goal facilitation and interference, self-regulation efficacy, and academic performance. The researcher will present the specific mechanisms that relate goals to academic performance, and evidence supporting these relations, in subsequent sections.
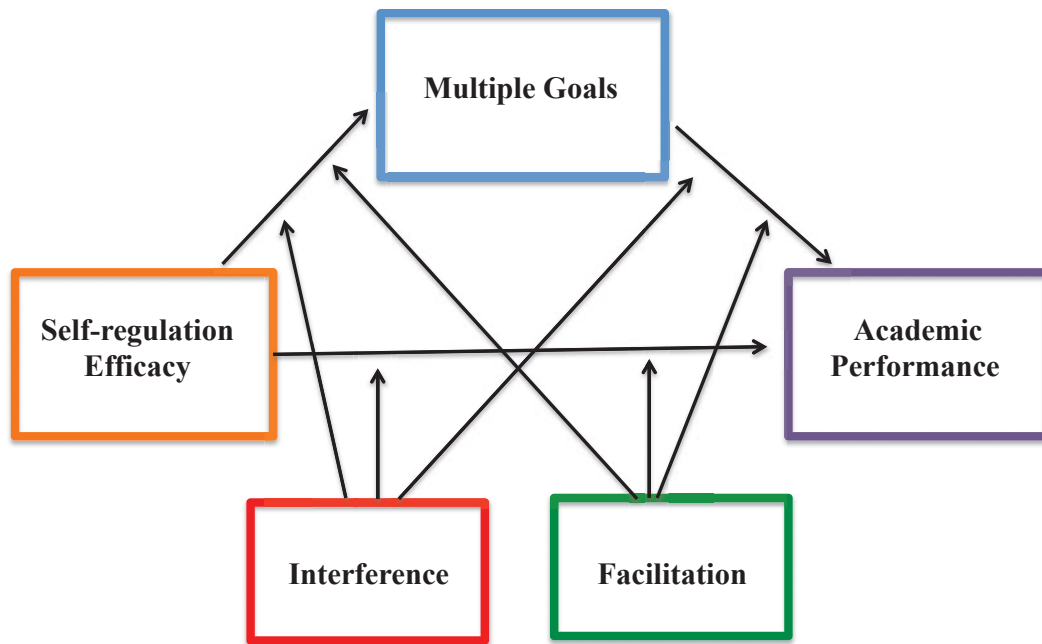


Figure 2. A process model linking multiple goal pursuit to academic performance.

The theoretical model presented in Figure 2 incorporates into a single model several pathways established in prior studies. Many researchers have examined the relationship between multiple goals and academic performance (e.g., Ames & Archer, 1988; Dweck & Leggett, 1988; Elliot & McGregor, 2001; Midgley et al., 1998; Pintrich, 2000; Wentzel, 1989, 1993a, 1996). Empirical support for the link between self-regulation efficacy and goal pursuit is also evident in the literature (Bandura et al., 1996; Chemers et al., 2001; Valentine, Dubuois, & Cooper, 2004).

Goal content models (see Ford & Smith, 2007; Wentzel, 2004) have long stressed the importance of relationships between the goals that predict psychological behavior and well-being. However, few studies link the pursuit of multiple goals to academic performance and take into account perceptions of the relations between goals (represented by interference and facilitation in Figure 2). Multiple goal pursuit is also proposed to mediate or partially mediate the relationship between self-regulation efficacy and academic performance. For example, students may believe that they are capable of regulating their behavior; however, if they do not pursue goals that facilitate classroom performance (e.g., excluding academic or social responsibility goals), it is unlikely that they will be as academically successful as students who do pursue such goals (e.g., Wentze1, 1989; Wentzel, Filisetti, & Looney, 2007).

**A Process Model of Multiple Goal Pursuit and Academic Performance**

The section that follows presents a brief discussion of the existing literature that provides support for the use of the current framework in understanding academic performance. This includes the role of multiple goals, self-regulation efficacy, and perceptions of inter-goal facilitation and interference in predicting academic performance. Figure 2 highlights the key constructs and underlying pathways of interest.

**Goal content.** Researchers exploring academic performance have traditionally examined goals as part of the goal orientation framework and focused primarily on combinations of mastery goals (i.e., where learning is a rewarding and self-sustaining outcome) and performance goals (i.e., where the focus is on competing with others and expending as little effort as possible; Ames & Archer, 1988; Dweck & Leggett, 1988; Elliot & McGregor, 2001; Midgley et al., 1998; Pintrich, 2000). This definition of goals

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is useful when exploring the reasons students give for pursuing achievement-related goals. The definition reveals nothing, however, about what students actually choose to do (Wentzel, 1993b). The goal content perspective provides a more valid platform from which to attend to the cognitive processes involved in, or the potential contextual influences on, the pursuit of specific goals (Dowson & McInerney, 2003).

Studies have consistently found that students pursue both social and academic goals in the classroom, and that the pursuit of these socially related goals directly relates to academic performance (e.g., GPA, SAT scores; Wentzel, 1989, 1993a, 1996). More specifically, the pursuit of social responsibility goals (e.g., How often do you try and do what your teacher asks you?) and prosocial goals (e.g., How often do you try and share what you have learned with your classmates?) are positive predictors of academic performance. On the other hand, in the absence of academic goal pursuit, researchers have found a relationship between frequent pursuit of interpersonal social goals, including wanting to make friends, or have fun, and lower levels of performance (Carroll, Durkin, Hattie, & Houghton, 1997; Carroll, Hattie, Durkin, & Houghton, 2001; Ojanen, Smith-Schrandt, & Gesten, 2013; Wentzel, 1989; Witkow, 2009).

In sum, a central assumption of the current study is that one should not consider students' pursuit of goals in isolation. The salience of any given goal likely depends on its interrelation with other goals at any given time (Shah & Kruglanski, 2002). If the desired end is to understand how students balance multiple goals in real classroom contexts (De Lemos & Goncalvez,, 2004), it is necessary to examine how self-regulatory efficacy, various combinations of goals identified by content, and perceptions of inter-

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goal interference and facilitation may directly and indirectly relate to academic performance (see Figure 2).

The next section presents an explanation of the self-processes that influence the relationship between multiple goal pursuit and academic achievement. The section begins with a description the role that self-regulation efficacy plays in goal pursuit, followed by a discussion of perceptions of inter-goal relations in the goal coordination process.

**Goals and self-regulation efficacy.** This study examines self-regulation efficacy, rather than self-regulation as defined by behavioral action. The term *self-regulation efficacy* refers as the perceived ability to regulate academic behaviors (e.g., How well can you study when there are other interesting things to do?; Bandura et al., 2003). The belief that one is able to regulate one's own behavior should help maximize the attainment of goals. For example, an individual's self-regulated behavior reflected in choosing to wait until the weekend to go to a movie when she has a test the next day relates, in no small part, to the fact that she *believes* that she can resist the urge to "have fun" with her friends at that moment. Indeed, study after study has supported the contention that self-reflections of perceived competence in accomplishing a given task are as important as actual competence when it comes to task completion, attempts at task completion, and goals directed toward task completion (Bandura & Wood, 1989; Beghetto, 2007; Bong, 2001; Donovan & Hafsteinsson, 2006; Hsieh, Sullivan, & Guerra, 2007; Shell & Husman, 2008; Usher & Pajares, 2008; Wentzel, 1996; Zimmerman & Kitsantas, 1999).

Efficacy also relates to an individual's propensity to engage in effective self-regulatory strategies and adopt goal patterns that are conducive to goal attainment (Bandura et al., 1996; Chemers et al., 2001). Therefore, the researcher chose to use

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efficacy as a construct of interest due, in part, to its clear role in self-management. There is a well-established link between high levels of self-efficacy and academic performance (e.g., Caprara et al., 2008; Valentine, Dubois, & Cooper, 2004). However, these studies do not address the specific role of self-regulatory efficacy when considering perceived relationships between goals. The following section explores these perceptions of inter-goal relations in relation to the goal coordination process.

**Inter-goal relations.** Some researchers have defined goal coordination as a life skill that falls into several categories of strategies (De Lemos & Goncalves, 2004; Dodge et al., 1989; Dowson & McInerney, 2003). For example, students could coordinate the goals of studying for a test and socializing with friends by deferring one goal for a period of time while they focus on the other goal (e.g., study first and then hang out with friends; Dodge et al., 1989). Goal coordination can also refer to the degree to which a person perceives that a given goal facilitates or interferes with the accomplishment of a second goal (Riediger, 2001).

For the purposes of this study, the researcher defined goal coordination as the process whereby perceptions of inter-goal relations, or the extent to which students perceive that their goals either conflict with (i.e., interfere) or facilitate one another, influence the relationship between self-regulation efficacy, having a particular goal set, and academic performance. There is evidence that the learning process is impaired when students perceive conflicts, or inter-goal interference, between their academic and non-academic goals (Fries, Schmid, Dietz, & Hofer, 2005; Hofer, Kuhnle, Kilian, & Fries, 2011; Ratelle, Vallerand, Senecal, & Provencher, 2005). Goal interference can result in difficulties when students try to pursue multiple goals. For instance, a student may come

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to see that the goal of getting good grades *interferes* with the goal of maintaining friendships. This interference could result from resource constraints (e.g., If I spend time studying, it takes away from time I can spend time with my friends) or from viewing disparate goals as inherently incompatible (e.g., I cannot be a good student and be popular or have friends).

In sum, when more than one goal exists, an individual must activate an action plan, or means, for goal attainment. If a student possesses overlapping goal attainment strategies, she understands that a single action directed toward attaining one goal can facilitate the attainment of a second goal (Riediger, 2001). In other words,  students must both want to pursue an appropriate array of social and academic goals in school, and perceive that these goals facilitate, rather than interfere, with each other to succeed academically. Researchers have yet to test this contention empirically.

**Academic performance and multiple goal coordination.** There is now empirical evidence that educators can predict academic performance using students' pursuit of a combination of goals related to social responsibility (e.g., following teachers rules, paying attention), prosocial (e.g., cooperating with peers), and academically (e.g., wanting to learn new things; Dowson & McInerney, 2003; Ford & Smith, 2007; Wentzel, 1989). For example, Wentzel (1996) found that social responsibility goals predicted academic effort in the 6th and 8th grades, even when controlling for academic motivation variables. Similarly, Wentzel (1989) noted that students with multiple goal profiles performed better academically than students who pursued single goals. In addition, Valle et al. (2003) concluded that students who pursued multiple goals (e.g., learning, performance, and social reinforcement goals) had higher levels of perceived ability and

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persistence, and used more deep learning strategies than students who pursued single goals.

The assumption in the present study is that the aforementioned pursuit of multiple goals requires a level of coordination and self-regulation efficacy. It is important to note that the focus here is on academic performance as an outcome, rather than learning (which may or may not be linked to performance), because the researcher wanted to explore the factors that motivate students *to try and succeed in school,* and be able to do so well.

**Summary.** Taken together, the reviewed evidence supports models of person-environment fit (e.g., Bronfenbrenner, 1989; Ford, 1992). One can only understand academic competence in terms of its context-specific effectiveness—as a product of personal attributes like goals, values, self-regulatory skills, and cognitive abilities—and in consideration of the ways in which specific attributes contribute to meeting situational requirements and demands (Ford, 1985). Pursuit of both social and academic goals appears to contribute jointly to other forms of motivation and to performance outcomes (e.g., Wentzel, 1989, 1993b). For example, pursuit of these goals can have a positive effect on academic performance because they direct efforts toward the achievement of socially desired outcomes related to achievement. Indeed, goals to improve ability lead to mastery-oriented behavior, goals to earn positive evaluations result in performance-oriented behavior, and goals to be socially responsible lead to classroom-appropriate forms of behavior that allow learning to take place (Wentzel, Baker, & Russell, 2012).

The literature suggests that goal coordination is not a single construct. Why might a student want to help another? How do social and academic goals work together to help

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predict academic performance?  It is the interaction of several factors related to goal pursuit, including goal content, the relationships between goals, and the ability (or belief in the ability) to regulate toward certain goals. It appears that goal coordination is, in fact, a system of processes not currently measured as a stand- alone construct. The idea of goal coordination as a system of processes is still speculative at this point. Understanding how students coordinate multiple goals requires the integration of knowledge related to the aforementioned constructs.

As such, a fundamental assumption in this study is that self-regulation efficacy predicts the pursuit of multiple goals and positively relates to success in school. In addition, the ability to see that goals facilitate rather than interfere or conflict with one another is likely a positive predictor of academic performance. The current study explores a model of multiple goal pursuit that examines these self-processes in tandem, taking both self-regulation efficacy and students' perceptions of inter-goal interference and facilitation into account, as described further in the following section.

**Assumptions of the model.** Academic performance requires the successful pursuit and coordination of adaptive goals in the classroom (i.e., goals that facilitate academic performance; Wentzel, 1993a). This study builds on the assumption that successful academic performance is, in part, the combined product of specific goals (e.g., social responsibility and academic goals) and the perception that one's goals primarily facilitate, rather than interfere with, each other. The researcher also assumed that self-regulation efficacy influenced goal combinations and that perceptions of inter-goal relationships alter these connections. The specific assumptions are as follows:

1.  Students are aware of some of the goals they pursue in the classroom.

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2. Students have perceptions of how their goals relate to each other (i.e., interfere with, or facilitate, one another).

3. Students have perceptions about their ability to regulate their academic behaviors and these perceptions influence the goals they pursue in the classroom.

4. Finally, a relationship exists between students' self-regulation efficacy, multiple goal pursuit, perceptions of inter-goal relations, and academic performance.

**The Current Study**

In this study, I focused on how self-regulation efficacy, multiple goal pursuit, and perceptions of inter-goal relations relate to academic performance. The goal of the study was to examine pathways that explained the established link between these variables. To this end, the researcher explored the potential pathways of influence that existed between self-regulation efficacy, multiple goal pursuit, and academic performance, and tested whether these effects varied according to students' perceptions of inter-goal interference and facilitation, as depicted in the conceptual model that guided this investigation (see Figure 2). Specifically, the first pathways examined whether self-regulation efficacy predicted multiple goals and academic performance, and whether multiple goals predicted academic performance. The researcher then tested a mediation model where multiple goals explained the relationship between self-regulation efficacy and academic performance. Lastly, the researcher explored the contention that perceptions of inter-goal interference and facilitation moderated the relationships between self-regulation efficacy, multiple goals, and academic performance (see Figure 2).

Boys and girls display different levels of social and academic behaviors and goal pursuit (e.g., Ford, 1985; Wentzel, 1991, Wentzel, Battle, Russell & Looney, 2010).

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There are also documented grade level differences in motivation throughout the middle school years (e.g., Wentzel, Battle, Russell, & Looney, 2010). In addition, there is evidence that minority groups might value different goals than majority groups do (e.g., Graham, Taylor, & Hudley; 1998). As such, the researcher decided to include gender, grade level, and ethnicity as control variables.

The sample for this study consisted of 665 students in grades 6-8th from two Southeastern school districts. The researcher gathered student information in the form of computerized surveys and grade point averages (GPAs) from school records. Students provided self-reported data about the goals they pursued in school, their self-regulation efficacy, and their perceptions of inter-goal interference and facilitation. Specifically, the researcher examined the extent to which students pursued 18 goals within six categories defined by Ford (1992):

- academic (i.e., "Learn new things," "Be challenged," "Get good grades");,
- interpersonal (i.e., "Make friends," "Be part of the popular group," "Have good relationships with my friends");
- prosocial (i.e., "Cheer up a classmate who is sad," "Share with my classmates," "Give help to my classmates");
- social responsibility (i.e., "Pay attention in class," "Follow rules," "Listen to my teacher");
- affective (i.e., "Feel happy," "Have fun," "Feel relaxed with no stress"); and
- autonomy (i.e., "Feel unique and special," "Make my own decisions and choices," "Feel confident about myself").

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The current study extends the literature on multiple goal pursuit by including the processing mechanisms that explain its relationship to academic performance. The following research questions and prediction served as a guide for the inquiry.

**1. To what extent do multiple goals, self-regulation efficacy, and perceptions of inter-goal interference predict academic performance?** The researcher posited that self-regulation efficacy would be a positive predictor of both multiple goals and academic performance. The investigator also anticipated that goal combinations that included academic and social responsibility goals also would be positive predictors of academic performance. Lastly, the researcher expected that perceptions of inter-goal interference would be a negative predictor of academic performance, while perceptions of inter-goal facilitation would be positive predictors of academic performance.

**2. Does self-regulation efficacy predict academic, social responsibility, and prosocial goals more than other goal combinations?** The researcher expected that self-regulation efficacy would be a stronger and more positive predictor of goal combinations that included academic and social responsibility goals than of combinations that excluded these goals.

**3. To what extent do multiple goals explain the relationship between self-regulation efficacy and academic performance? In other words, do multiple goals mediate, or partially mediate, the relationship between self-regulatory efficacy and academic performance?** The researcher predicted that students' goals would mediate the relationship between self-regulation efficacy and academic performance.

**4. To what extent do perceptions of inter-goal interference and facilitation moderate the relations between self-regulation efficacy and multiple goals, multiple**

**goals and academic performance, and self-regulation efficacy and academic performance?** The researcher expected perceptions of inter-goal interference and facilitation to moderate the relationships between self-regulation efficacy, multiple goals, and academic performance.

**5. Do the mediating effects of multiple goals differ for groups high or low in perceptions of inter-goal interference or facilitation?** The researcher posited that students who possessed higher scores on perceived inter-goal interference would have lower academic performance than did those students with lower interference scores, and that students with higher scores on perceived inter-goal facilitation would have better academic performance than did students with lower facilitation scores.

**Key Terms**

1. **Goals -** cognitive representations of what an individual wants to achieve in a given situation (Wentzel, 2000)

2. **Self-regulation efficacy -** beliefs about one's ability to regulate academic behaviors (Bandura, 1990)

3. **Inter-goal relations -** the degree to which an individual perceives that their goals facilitate, rather than interfere or conflict with, one another (Riediger, 2001)

4. **Academic performance -** overall cumulative GPA in academic subjects (e.g., reading, math)

**Chapter 2: Review of Literature**

Although researchers have explored the importance of goal coordination and goal conflict resolution in relation to specific competencies (e.g., social competence) for many years (Delveaux & Daniels, 2000; Dodge et al., 1989; Ford, 1985; Pert & Jahoda, 2008), research examining the exact ways in which the motivational processes associated with goal pursuit influence academic accomplishments has not been forthcoming (Wentzel, 1999). This chapter provides a review of the evidence linking goals to academic performance that stems from the goal content theory framework (which includes issues related to goal measurement). The chapter also includes an examination of the role of goal coordination in academic competence and examines processes involved in the successful coordination of goals. Specifically, the current review explores literature on the role of perceptions of inter-goal relations and self-regulatory efficacy as coordination processes that relate to the goals students pursue and their academic performance.

**Goal Content Theory**

Goal content researchers have focused on the objectives that students want to accomplish or actions that they wish to take (Boekaerts et al., 2006; Dowson & McInerney, 2003; Ford, 1992; Wentzel, 1993ab). Therefore, one can separate a student's reasons for pursuing certain goals (i.e., goal orientation theory) from the behavioral outcomes associated with goal pursuit (Wentzel, 1993b). This perspective allows for the identification of all goals that students pursue in the classroom that relate to academic performance, including prosocial and responsibility goals. Accordingly, the content perspective also addresses the functionality of real life goal sets and how these goals might affect behavior.

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With regard to school-related outcomes, research has shown that high and low achieving students pursue differing goals for varying reasons (e.g., Ojanen, Smith-Schrandt, & Gesten, 2013; Urdan & Mestas, 2006; Wentzel, 1989; Wentzel, Fillisetti & Looney, 2007). For instance, students who pursue social responsibility goals tend to have higher grades and experience more acceptance from their peers than do students who do not behave responsibly (e.g., Troop-Gordon & Asher, 2005; Wentzel, 1989; Wentzel, 1991; Wentzel et al., 2007). In the same vein, Wentzel (1994) found that the pursuit of prosocial goals (e.g., help, share, and cooperate with others) predicted prosocial behaviors in the classroom, and that these goals were positive predictors of academic success.

The goal content perspective has resulted in several models addressing the fact that students must often simultaneously pursue individual (i.e., personal) goals and person-environment (i.e., interpersonal) goals in a given situation. Ford (1992) was one of the pioneers in the development of a motivational model and goal taxonomy that examined these issues. He conceptualized personal goals as directive cognitions that steer self-regulatory processes affecting goal selection, striving, and accomplishment. He posited that to coordinate multiple goals, students must acquire the necessary action programs (e.g., negotiating, resolving conflict) to attend to the demands of both interpersonal (e.g., I want to be/should be responsible/caring) and personal goals (e.g., I want to have fun and be popular) in tandem. He also suggested that self-regulatory strategies are necessary for the consolidation of goals, although he never fully tested these ideas empirically.

Wentzel (2004) devised a model of classroom competence that describes the successful pursuit of academic and adaptive social goals as the result of the relationship

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between supportive self- and social motivational processes.  Supportive self-processes include self- efficacy beliefs (e.g., I think I can do well in my academic courses), control beliefs (e.g., I do well in because of my efforts) and emotions (i.e., motivating emotions that encourage goal pursuit, or demotivating affective states that hinder goal pursuit). Social-motivational processes encompass a range of social aspects in the classroom that can impact these self-processes. These aspects include instrumental and emotional support from, and the high expectations and values of, teachers and peers. As such, Wentzel's model aligns with Ford's (1992) contention that individual goal pursuit depends upon an individual's evaluative beliefs about the self, social relationships, and contextual settings.

Models that focus on self-regulatory processes as the guiding force in multiple goal coordination center on a student's ability to set goals, take appropriate action toward achieving those goals, and subsequently evaluate outcomes related to the goals (e.g., whether actions were effective or ineffective in accomplishing their goals; Bandura, 1986; Verplanken & Holland, 2002). In essence, the processes focus on a student's metacognitive skills, which include the ability to evaluate situations effectively, monitor progress, and ignore irrelevant information related to their capacity for balancing multiple goals (see Zimmerman & Moylas, 2009). Researchers who take this approach have argued that a combination of a student's directive processes guides effective social and academic behavior, and have emphasized students' ability to attend to certain goals and choose to defer attention from irrelevant goals, as needed (Ford, 1985; Patrick, Ryan, & Kaplan, 2007). There is evidence that when focusing on a focal goal students must inhibit or ignore unrelated alternative goals (e.g., going to a party), and focus their resources on attaining the primary objective (e.g., get a good grade).

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Further, priming or having *related* goals may help in the attainment of focal goals (Shah & Kruglanski, 2002).

It may be, as Ford (1992) has suggested, that goals with multiple connections have higher motivational significance, and that having a set of related goals encourages the pursuit of a target goal because there is more than one reason for engaging in a directed course of action. The recognition of the complementary (or facilitative) nature of said goals may, in the end, help determine behaviors related to successful multiple goal pursuit. In the same vein, perceiving that goals conflict, or interfere, with one another could hinder the pursuit of multiple goals.

**Measuring goal content and conflict.** The current study examined the role of goal content and goal conflict (i.e., inter-goal interference) as part of the goal coordination process. Researchers have chosen to measure goal content in two basic ways: via self-report or a combination of self-reports and observations. Each of these approaches has implications when designing a multiple-goal study. Many researchers have taken a qualitative self-report approach to form goal taxonomies used in exploring goal effects. Participants either participate in interviews where they must explain their goal pursuits or generate lists of goals they pursue. Researchers later organize these responses into conceptually related categories (e.g., Dowson & McInerney, 2003; Ford, 1992).

Qualitative approaches offer unique and direct insights into the processes that define goal coordination. Dowson and McInerney (2003), for example, took a qualitative goal content approach to studying middle school students' classroom goals. Through a series of interviews and observations with elementary and secondary level students (ages

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12-15) they established a taxonomy of three academic (mastery, performance, work avoidance) and five social (social affiliation, approval, responsibility, status, and concern) goal sub-categories. They obtained data related to the way in which these goals operated. For example, one student described a goal conflict in the following way: "I want to make friends, but I also want to get good grades, so I don't know when to work hard sometimes." In this case, there was a clear and direct conflict between the goals and a feeling of ambiguity about a solution. Another student described the convergence of goals that he or she could accomplish concurrently: "I want to do well in all my subjects and have lots of fun when trying to learn new things with my friends." Although the student did not express the sentiment explicitly, in this case the two goals seem to be complimentary, and appear to facilitate, rather than conflict with, one another.

Ford (1992) created one of the most comprehensive taxonomies currently available to organize the many goals students might have. It provides a rich source from which to formulate hypotheses about the complex cognitions that motivate academic performance, and the multiple domains of goal pursuit (e.g., academic, social responsibility) that have relevance for understanding academic performance. Indeed, others have used portions of this taxonomy to create Likert-scale goal measures (e.g., social responsibility; Wentzel et al., 2007) to formulate hierarchical goal structures within individual goal profiles or clusters (Boekaerts, Smit, & Busing, 2012; Chulef, Read, & Walsh, 2001; McInerney, Marsh, & Yeung, 2003; Valle et al., 2001), and to provide a framework for understanding the relationship between multiple goal pursuit and academic performance in the classroom (Boekaerts, Koning, & Vedder, 2006).

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For example, Wentzel (1989, 1993a, 1998) created a measure that examines goals categorized as interpersonal or social in nature. Her five-point Likert survey (1 = *never* and 5 = *always*) asks students to respond to questions like "How often do you try to do what your teacher asks you to?" (i.e., social responsibility goals)?" and "How often do you try to share what you've learned with your classmates?" (i.e., prosocial goals)?". Students also reported the extent to which they pursued academic goals (e.g., How often do you try to learn something new in this class, even if you don't have to?) also rated on a five-point Likert scale (1 = *never* and 5 = *always*; Wentzel, 1994). Researchers have repeatedly validated these instruments and found them to be reliable and predictive of social and academic classroom behaviors.

Chulef and colleagues (2001) included Ford's (1992) goal taxonomy as part of the 135 goals included in their study. They reduced these 135 goals into 30 clusters and found the broadest distinction to be between social goals (e.g., interpersonal goals related to interacting with people in general) and individual goals (e.g., intrapersonal goals including goals to achieve). Goals also fell into meaningful higher order clusters, with lower level goal structures being relatively homogeneous groups that merged into broader categories at increasingly higher levels of abstraction (Chulef et al., 2001).

Similarly, Boekaerts and colleagues (2012) found that the original 24-goal categorizations suggested by Ford (1992) manifested as nine distinct goal groupings in a group of vocational students. These categorizations included mastery and management goals (e.g., I want to learn new things; I want to complete my work in time), social support goals (e.g., I want to support others; I want others to help me when I have difficulties), self-determination and equity goals (e.g., I want to be treated fairly; I want to have decision

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latitude), feel-good goals (e.g., I want to feel confident; I want to feel happy; I want to enjoy my studies), belongingness and social responsibility goals (e.g., I want to be liked; I want to feel welcome in the group; I want to respect others), safety goals (e.g., I want to stay out of trouble; I want to avoid risks), superiority or performance goals (e.g., I want to be better than others; I want to impress others), individuality goals (e.g., I want to have special things; I want to be unique), and material gain goals (e.g., I want to earn a lot of money; I want to have many clothes). These findings suggest that Ford's (1992) taxonomy is a useful organizational tool for studying goal content and goal content categories, although these categories might vary in different populations.

Other researchers have assessed goals and goal conflict using vignettes that probe the content of a student's goals in a given context (Rabiner & Gordon, 1992; Troop-Gordon & Asher, 2005). Responses to these hypothetical situations often seem to correspond to how an individual would behave or think in a similar "real-world" situation. For example, researchers have examined goals and goal conflict resolution strategies by presenting groups of socially rejected children with scenarios in which students face obstacles in achieving their goals. Students then must state or select the strategies and goals they would employ in the given situation (e.g., What would you do, and what would your goals be, if that didn't work?; Rabiner & Gordon, 1992; Troop-Gordon & Asher, 2005).

Although this vignette approach is useful for studying goals and goal conflict, particularly in younger samples, it poses several limitations. Most of the issues that arise involve validity. For instance, in regard to predictive validity, one would expect that higher scores on such measures would correlate positively with more problem-solving

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ability and behaviors in the classroom. However, scores on measures designed to assess strategy knowledge and problem solving using vignettes have not always correlated well with behavioral ratings in normative samples (e.g., Shure, Spivack, & Jaeger, 1971) or with behavior problems over time (e.g., Gillespie, Durlak, & Sherman, 1982; Meisel, 1989; Youngstorm et al., 2000). Further, researchers in these scenarios always present the student with a preconceived problem or tell them that there is, in fact, a conflict that they must solve, all of which influences content validity.

If the aim is to assess a student's inherent ability to coordinate their goals, or resolve issues that arise when goals conflict, the first step would be to examine how adept they are at first identifying whether a problem even exists. The failure to provide students with this opportunity results in a measure that does not tap into an important meta-cognitive antecedent to goal coordination and conflict resolution (Crick & Dodge, 1994; Dodge, Asher & Parkhurst, 1989), which could relate to the aforementioned predictive validity issues regarding behavioral action.

A more valid assessment of a student's goals and coordination strategies would be less contextualized and would consider the possibility that the student did not perceive any conflict in a given scenario. To increase the validity of goal assessments, one could allow students a choice in goals and assess perceived goal conflict or facilitation. Permitting students to select their goals and later asking them about their perceptions of the goals interference (i.e., perceiving goals to conflict with one another) and facilitation (i.e., perceiving goals as being related and facilitative of one another) would be one way to address this. For this reason, the current researcher allowed students to select their

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goals and then asked them about perceptions of inter-goal interference and facilitation (i.e., Inter-goal Relations Questionnaire; Riediger, 2001).

A goal content perspective increases precision when measuring the types of goal profiles and goal conflicts that exist, and in doing so, aids in the development of a more accurate depiction of the relationship between multiple goal pursuit and academic performance. The next section describes existing research linking specific goal content to academic performance and explores why some goals relate more closely to academic performance than do others.

**The Relationship Between Social Responsibility, Prosocial Goal Pursuit, and Academic Performance**

Wentzel (1989, 1993a, 1996) consistently found a close relationship between the pursuit of socially valued goals (e.g., social responsibility goals) and academic performance (e.g., GPA, SAT scores). More importantly, Wentzel (1989) concluded that students who did not perform well academically still reported trying to learn as much as higher achieving students. Differences only emerged in the rate at students reported pursuing social responsibility goals, with higher achieving students reporting pursuit of such goals more often (Wentzel, 1989). Lower performing students also reported pursuing the goal "to have fun" (i.e., an affective goal) more often than did their higher achieving peers (Wentzel, 1989).

Other studies have resulted in similar findings and conclusions that one must view the successful coordination of goals as a context-dependent process. For instance, Wentzel (1993a) noted that goals may emanate from the individual or from a given context, and that such objectives are socially derived constructs. Schools, in particular,

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provide a context that requires students to pursue goals that go beyond intrinsic interpersonal goals. Indeed, teachers value students who pursue social responsibility and prosocial goals because they create a positive classroom climate (see Rolland, 2012 for a review).

Many researchers have focused on the fact that goals can be compatible or incompatible (e.g., Argyle, Furnham, & Graham, 1981, Dodge, Asher & Parkhurst, 1989; Giota, 2002). Dodge and colleagues (1989) contend that goal coordination implied the integration of self-goals (e.g., to win a game) and other goals (e.g., to maintain a relationship). As mentioned in Chapter 1, researchers have defined successful goal coordination and academic performance, in part, as the ability to attain one's personal goals alongside the goals of others. Further, a qualitative analysis of middle school students' reasons for attending school revealed that students who espoused goal combinations that incorporated the perspectives of others (e.g., trying to fulfill teacher/parent wishes) with traditionally self-referent goals (e.g., going to school so they can get a good job) had higher grades than did students who solely adopted self-referent goals (Giota, 2002). As alluded to previously, these results indicate an ability to coordinate social and academic goals and imply that students who valued and espoused both social responsibility (e.g., follow teacher rules) and academic (e.g., desire to do well in school) goals had a tendency to outperform their peers who did not pursue such goals (Wentzel, 1993a).

Researchers have also reported that students who engaged in delinquent behavior pursued more freedom or autonomy goals (e.g., to be able to do whatever I want, to have fun) and fewer interpersonal (e.g., to help others, to be dependable and responsible) and

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educational (e.g., to get things done on time, to learn new things at school) goals (Carroll, Durkin, Hattie, & Houghton, 1997; Carroll, Hattie, Durkin, & Houghton, 2001). Further, several studies have revealed that students who reported higher "well-being value" (e.g., I believe it is mainly important to have fun in life and experience it to the fullest) performed worse academically, and engaged in more off-task (e.g., read a note in class) than on-task (e.g., followed the lesson) behaviors in class, than students who ascribed a lower value to "having fun in life" (Hofer, Schmid, Fries, Kilian & Kuhnle, 2010; Kilian, Hofer, Fries, & Kuhnle, 2010; Kuhnle, Hofer, & Kilian, 2012). These studies suggest that students who pursue goal sets that exclude social responsibility goals should display lower levels of academic performance than do those who include such goals. It is also possible that students who pursue affective (e.g., to have fun) or interpersonal peer-related goals (e.g., make friends) at the expense of academic and social responsibility goals will experience low levels of academic achievement.

Indeed, Wentzel (1991) found that socially responsible goal pursuit was a significant predictor of GPA. Wentzel defined social responsibility goal pursuit as a composite social responsibility goal score derived by averaging standardized prosocial (e.g., How often do you try to help your classmates solve a problem once you've figured it out?) and compliance (How often do you try to do what your teacher asks you to?) goal scores, Specifically, social responsibility or compliance goal pursuit, alongside other self-processes that included inter-personal trust (i.e., peer nominations of someone who "keeps promises and is someone you can trust"), and inter-personal problem solving (i.e., peer nominations indicating a student "tries really hard to solve problems and disagreements with other kids") explained 11% of the unique variance in GPA. In

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addition, students nominated as being more likely to share, cooperate, and help others (as nominated by peers) when they have a problem explained an additional 13% of the variance in the model.

Evidence that prosocial and socially responsible behaviors are also positive predictors of academic performance further supports the notion that prosocial and social responsibility goals play a significant role in facilitating academic achievement. In other words, students who pursue prosocial and socially responsible goals are more likely to engage in behaviors linked to academic achievement (e.g., Feldman & Wentzel, 1990; Ojanen, Smith-Schrandt, & Gesten, 2013; Wentzel, 1991, 1996; Wentzel et al., 2007).  In addition, Wentzel, Weinberger, Ford, & Feldman (1990) noted that socially responsible behaviors (presumably influenced by the pursuit of social responsibility goals) mediate the effects of self-regulatory processes on grades. This finding is particularly relevant to the present study, which built on the supposition that specific goal content (e.g., pursuing social responsibility goals) would mediate the relationship between self-regulatory efficacy and academic performance. One could conclude that socially responsible behaviors require a certain amount of self-regulation to exert their positive effects. After all, if a student is to succeed in the classroom they must, at a minimum, sit down, pay attention, and listen to the teacher; and they are more likely to do so if they have the goals of "paying attention" and "listening to the teacher."

In sum, any substantive discussion of multiple goals at school should include an explicit discussion of students' prosocial and social responsibility goal pursuit. A student may be fully capable of achieving positive academic and social outcomes, but if they lack goals conducive to academic performance or social competence, it is unlikely that they

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will engage in behaviors that result in academic success. The next section offers a review of literature that addresses the direct and indirect links between self-regulation efficacy and academic performance.

**Self-Regulation Efficacy, Goals, and Academic Performance**

Bandura (1986) conceived of goals as standards in a self-within context feedback system and focused on self-efficacy as a guiding force in goal-directed behaviors. This socio-cognitive model of self-regulation defines self-efficacy as beliefs about one's ability to produce designated levels of performance based on standards (Bandura, 1986). According to Bandura (1986, 1997), efficacy levels help to determine the goals that people pursue and influence their success in achieving those goals. The consensus is that higher levels of efficacy have a positive effect on goal selection, goal persistence, performance levels, and strategy use (e.g., Bandura & Cervone, 2000; Donovan & Hafsteinsson, 2006; Kitsantas & Zimmerman, 2009; Valentine, Dubois, & Cooper, 2004; Zimmerman, Bandura, & Martinez-Ponz, 1992; Zimmerman & Kitsantas, 1999).

Although not a direct measure of behavioral self-regulation, efficacy for self-regulation may have a positive connection to goal pursuit and academic performance. A growing body of evidence indicates that self-regulatory efficacy has a direct effect on academic performance (Bandura et al., 1996; Carroll, Gordon, Haynes, & Houghton, 2013; Chemers et al., 2001; Rapp-Paglicci, Stewart, & Rowe, 2011). Self-regulation efficacy could also exert an indirect effect on academic performance via goal pursuit, because self-efficacy can influence an individual's decision to modify a given goal. Individuals are more likely to engage in upward goal revision (i.e., choosing a more challenging goal) when efficacy levels are high (Carroll et al., 2013; Donovan &

Hafsteinsson, 2006). Defined in this way, self-regulation efficacy becomes central to goal pursuit and, in turn, academic performance.

Further, existing evidence suggests that efficacy predicts goal patterns (Bandura & Wood, 1989; Beghetto, 2007; Bong, 2001; Donovan & Hafsteinsson, 2006; Kitsantas & Zimmerman, 2009; Shell & Husman, 2008; Hsieh, Sullivan & Guerra, 2007; Usher & Pajares, 2008; Wentzel, 1996; Zimmerman & Kitsantas, 1999). For example, researchers have identified a relationship between efficacy levels and an individual's propensity to engage in effective self-regulatory strategies and adopt goal patterns that are conducive to goal attainment. Shell and Husman (2008) found a consistent association between lower levels of self-efficacy (e.g., How confident are you that you can take effective notes over class lecture?) and lower levels of self-regulation, as defined by self-regulated strategy use (e.g., In this class, I try to determine the best approach for studying each assignment). This finding supports Bandura's (1986) claim that reciprocally related self-processes help to determine goal-directed behaviors. In other words, an individual's perceived levels of efficacy govern goal-directed actions and self-regulatory strategies. An individual must think they are capable of executing a regulatory strategy to employ said strategy when pursuing goals.

The participants in studies of self-regulation efficacy have been diverse and produced comparable effects in elementary school (Usher & Pajares, 2008), middle school (Beghetto, 2007; Wentzel, 1996), high school (Zimmerman & Kitsantas, 1999), college (Shell & Husman, 2008; Hsieh, Sullivan & Guerra, 2007), and adult (Bandura & Wood, 1989; Donovan & Hafsteinsson, 2006) samples. These samples also demonstrated racial and ethnic diversity. For example, Bong (2001) found that efficacy positively

predicted task value (e.g., I think what I learn is important) and achievement goals (e.g., I like to complete problems and materials that really make me think) in Korean middle school students (Bong, 2001). Donovan and Hafsteinsson (2006) also concluded that efficacy moderated the effects of goal performance discrepancies in Icelandic adults.

Given that individuals have a finite amount of time and energy to invest into any activity; self-regulation also dictates the amount of time allocated to achieve one particular goal standard over another (Witkow, 2009). In school, students demonstrate adaptive self-regulation, in part, by the amount of time they dedicate to academic work. There is some evidence that academically successful students spend less time on social activities than do lower performing students (Witkow, 2009). Witkow (2009) also found that high-achieving students also appeared to spend extra time studying, and less time with friends, when workloads are high. This negative relationship, however, is not apparent in lower-achieving students who devoted more time to their friends than their schoolwork regardless of their workload (Witkow, 2009). In the case of high achieving students, time allocation reflected a meta-cognitive awareness of priorities, and supported the assumption that a student pursues and prioritizes academic goals and regulates resources toward that goal.

If, however, a student prioritizes the goal of having fun with friends over getting good grades, and they believe that having fun with friends interferes with their ability to do homework, they may be less academically successful. Indeed, students who think it is highly important to "have fun in life" reported higher levels of perceived motivational interference when faced with a scenario where they had to prioritize an academic goal

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(e.g., to pay attention to a lesson in class) over an alternative non-academic aim (e.g., to read notes passed to them in class by a friend; Kilian, Hofer, Fries, & Kuhnle, 2010).

Regardless of the mechanism, academically successful students seem able and willing to coordinate the goals of achieving academically and socially in ways that their lower performing counterparts do not. It is important to note, though, that self-regulation ability can be a limited resource (see Carver, 2004), and its depletion could lead to problems in achieving a desired behavior. For example, dedicating resources to socially undesirable standards like trying to impress peers may leave little regulatory strength for studying. One could assume that the individual in said scenario is also more likely to believe they are not capable of regulating behavior aimed at achieving multiple goals. Over time, they could end up with less well-developed strategies for coordinating goals, or be far more likely to engage in certain strategies like abandoning goals conducive to academic performance (Dodge, Asher, & Parkhurst, 1989). In other words, they would be more likely to believe that these goals interfered with one another.

This perception is due, in part, to cycles of reinforcement (see Crick & Dodge, 1994) in which repeated actions (whether adaptive or not) become solidified, and sometimes automatic, patterns of behavior. If a student lacks regulatory ability and consistently fails to accomplish the goal of performing well in school due to the activation of other "interfering" goals, an automatic script may emerge in which the strategies for accomplishing at least one goal (e.g., having friends) take precedence over formulating strategies that have proven ineffective in accomplishing multiple goals. This automatic pattern of behavior might then become the norm, and eventually, the student abandons goals that she once pursued (e.g., getting good grades) in favor of goals that she

can successfully accomplish (e.g., making friends). The inherent need for competence, in any area, thus becomes a key factor in determining behavioral and motivational patterns (Connell & Wellborn, 1991).

Kuhl's (1985) limited resource perspective aligns with this view and suggests that parsimonious decision-making (i.e., using as few resources as possible in the decision making process) could relate to successful goal coordination. If, for instance, a student perceives that trying to "get good grades" exhausts resources that he could direct toward "having fun" (i.e., interference), then he will likely direct his energy toward attaining one, rather than both, goals (Wentzel, 1999). If a student directs his resources toward academic goals, academic performance should thrive. Evidence suggests a relationship exist between the experience of goal conflict or interference and factors that might hinder academic performance, including lower levels of concentration and increased levels of academic hopelessness (Ratelle et al., 2005). In addition, there is evidence that conflicts perceived to be highly difficult to resolve (e.g., wanting to do homework vs. watch TV) cause performance impairments (Fries et al., 2005).

Therefore, as suggested by the conceptual model guiding this study (see Figure 2), one should consider the relationship between a student's beliefs about their ability to self-regulate and their propensity to pursue a variety of goals that facilitate academic performance (e.g., dedicating resources to both social and academic goals). This ability, in turn, should vary according to students' perceptions of inter-goal interference or facilitation.

Models of self-regulation applied specifically to the classroom are also relevant to this discussion (Schunk & Zimmerman, 2008; Zimmerman, 2000, Zimmerman &

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Maylon, 2009). The self-regulated learning (SRL) model has become a popular way of framing research regarding self-regulatory behaviors and processes in school settings. Self-regulated learning involves the interaction between academic self-regulatory and meta-cognitive strategies used in the classroom (e.g., rehearsing, memorization aids, self-consequating), self-efficacy, and academic goals (Zimmerman & Maylon, 2009). As such, studies based on SRL typically focus on the use of said strategies to achieve academic goals. These strategies are often contingent upon self-beliefs (i.e., perceptions of efficacy; Schunk & Zimmerman, 2008).

A focus on such strategies is beyond the scope of this study and provides impetus for future work in this area. However, the current study does focus on goal attainment strategies that relate to perceptions of inter-goal relations. The following section provides a review of evidence that a propensity to see goals as facilitative or interfering with one another might affect the goal coordination process and explain how self-regulation efficacy differs from the construct of inter-goal relations.

**Goal Coordination and Inter-Goal Relations: Facilitation vs. Interference**

Inter-goal facilitation occurs when one goal increases one's likelihood of attaining a second goal, and inter-goal interference occurs when one goal impairs one's likelihood of attaining a second goal. More specifically, one can best understand goal interference in terms of (a) resource constraints (e.g., investing less time in one goal due to pursuit of another goal) and (b) incompatible goal attainment strategies (e.g., engaging in actions toward the pursuit of one goal that are incompatible with the achievement of another goal). Goal facilitation, on the other hand, refers to (a) instrumental goal relations (e.g., pursuing one goal sets the stage for the realization of another goal) and (b) overlap in

goal attainment strategies (e.g., strategies used in the pursuit of one goal are simultaneously beneficial to the pursuit of another goal).

It is possible that positive or negative outcomes regarding the resolution of goal conflict are the result of student perceptions of the relationship between goals. For example, studying with friends is a way to both maintain friendships and prepare for a test. It is also possible that progress made toward one goal already represents the first step toward another goal. Knowledge of this instrumental relationship between goals can also facilitate the attainment of more than one goal (e.g., having a good relationship with a teacher may result in the provision of resources that foster higher academic performance; Riediger, 2001). Research suggests that a positive relationship exists between higher levels of perceived goal facilitation and engagement in actual goal pursuit, particularly in the long term (Riediger & Freund, 2004). Conversely, a student's perception of conflicts, or inter-goal interference, between his academic and non-academic goals leads to the impairment of the learning process (Fries et al., 2005; Kilian, Hofer, Fries, & Kuhnle, 2010; Ratelle et al., 2005).

Other studies support the contention that goal conflict interferes with behaviors related to goal pursuit. For example, Emmons and King (1988) found a negative relationship between self-reported daily activities and perceptions of conflicts between personal goals in a group of undergraduates. When students reported high levels of conflict between goals, they were less likely to report engaging in activities they thought were related to achieving these goals. Students who perceived high levels of goal conflict also reported experiencing higher rates of negative emotional states, including depression, anxiety, and neuroticism.

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Research utilizing diaries to keep track of goal-directed activities also indicated that when subjects reported that they were working on an obstacle, they were more likely to experience *want conflicts* between goals (Riediger & Freund, 2008). Riediger and Freund (2008) explained that want conflicts occurred when an individual engaged in activities directed toward one goal, while reporting a desire to be doing something more enjoyable, such as a leisure activity. The researchers also saw evidence of higher cognitive load (i.e., resource depletion) when subjects experienced more want conflicts during instances when they had an explicit goal in mind (e.g., At this moment, I had an explicit goal in mind and was pursuing it; Riediger and Freund, 2008).

Riediger and Freund (2008) also found that respondents with explicit goals also experienced fewer *should conflicts*. They described should conflicts as the feeling that one should be doing something else that is more responsible, reported as studying or working more (Riediger & Freund, 2008). It appears that interference between more "desirable" leisure activities and other goals are more prominent when cognitive load is high. However, if one has the means (e.g., *strategies*) to resolve a specific goal conflict (i.e., one is currently engaging in actions directed toward goal pursuit), then the individual is less likely to experience should conflicts positively related to experiencing negative emotions. Riediger and Freund (2008) referred to this phenomenon as the *guilt-free effect*. If resources are strained, we are more vulnerable to the psychological distraction of more fun or desirable activities. At the same time, we are also less likely to feel negative emotions associated with ignoring less enjoyable goals that are more conducive to productivity. One must ask, then, why individuals experience that want

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conflict at all. One possibility is that people often believe that the two desires or goals are incompatible, or interfere, with one another.

Kuin and Townsend (1998) found that the urgency or importance of a goal when one encounters interference or conflict also affects goal coordination strategies and future goal setting. The researchers found that high school students presented with a scenario in which academic (e.g., complete an assignment) and social goals (e.g., go to a party) conflicted were more likely to rate the social goal as important, and more likely to pursue the social goal when the academic goal was not urgent (Kuin & Townsend, 1998). However, the students consistently preferred strategies that allowed them to work toward both goals when the academic goal was important or urgent (Kuin & Townsend, 1998). In other words, it is possible that students are more likely to defer a less appealing goal (e.g., academic goal) when there seems to be an obstacle (i.e., interference due to urgency or importance of a prioritized social/non-academic goal).

Troop-Gordon and Asher (2005) found similar effects in elementary school students presented with a peer-conflict scenario. The researchers presented students with various scenarios (e.g., A classmate refuses to return a puzzle piece that the subject needs to finish a puzzle) and then asked the students what they would do to resolve the conflict if their initial strategy "did not work." The goals and strategies that students offered in response tended to be less prosocial in nature (e.g., aggressive strategy: "I would hit him," goal: "retaliating") than if there was no obstacle (e.g., fair solution: "May I have it? I was here first," goal: "seeking fairness"). These findings suggest that more appealing self-goals may take precedence over relationship maintenance goals when individuals

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encounter an obstacle or interference (i.e., it is more difficult or not possible to accomplish both goals).

The current study addressed the fact that the effects attributable to perceptions of inter-goal interference (i.e., conflict, obstacles) or facilitation are conceptually distinct from the idea of self-regulation efficacy, which relates to perceptions about whether one can control discrete academically-related behaviors. One can have high self-regulation efficacy and still perceive goal interference. Nevertheless, as described in the previous sections, efficacy for self-regulation is a critical process in effective goal coordination. The section that follows provides a summary of how these self-processes work together to explain goal coordination.

**Summary of Gaps in Literature**

The reviewed evidence warrants the joint examination of the constructs included in the current study (see Figure 2). It is clear that both goal content (Ford & Smith, 2007; Wentzel, 1989, 1993b, 1996) and efficacy (Bandura & Cervone, 2000; Zimmerman, Bandura, & Martinez-Ponz, 1992; Zimmerman & Kitsantas, 1999) are related to academic performance, and that a relationship exists between efficacy and the types of goals students pursue (Donovan & Hafsteinsson, 2006; Shell & Husman, 2008). Inter-goal relations, conflict or interference in particular, are also related to academic performance (Fries et al., 2005; Ratelle et al., 2005).

It is reasonable to assume that these processes are conducive to academic performance. It is not enough to simply have or pursue goals that facilitate academic performance; a student must also believe that these goals relate to one another without interference. Research has shown that the simple experience of such goal conflicts can be

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detrimental to academic outcomes (e.g., Fries et al., 2005; Ratelle et al., 2005). In the same vein, beliefs about self-regulation (i.e., self-regulation efficacy) should only be predictive of positive academic outcomes if the student is regulating toward goals conducive to higher academic performance.

These constructs are independent contributors to academic performance; however, it is necessary to explore the combined impact of these processes on academic performance, as well. Self-regulation efficacy is a regulatory process, intended to direct resources aimed at goal pursuit (e.g., believing one can manage time to accomplish more than one goal). Perceptions of inter-goal relations are, on the other hand, an evaluative process (i.e., meta-cognitive process)—a personal awareness that one goal interferes with another. For example, self-regulatory efficacy and inter-goal relations are mechanisms that contribute both separately and jointly to goal coordination. A student who believes that their goals facilitate, rather than interfere, with one another will not necessarily be successful in coordinating their goals if they lack self-regulation efficacy. Likewise, high self-regulation efficacy does not automatically imply that a student perceives that their goals facilitate, instead of interfere with, each other. Goal content distinguishes itself from the latter two constructs as a directive cognition, one that dictates the types of goals an individual can and will select. The impact of goal content on academic performance, however, depends on said self-regulatory and meta-processing (see Ford, 1992).

In addition, although there is research that addresses multiple goals and the strategies employed to resolve goal conflicts in young adolescent samples (e.g., Rabiner & Gordon, 1992; Troop-Gordon & Asher 2005), much of the research on inter-goal relations has focused on undergraduate or adult samples. This lack of focus on younger

populations is problematic because there is evidence that goal conflict or interference is more prevalent, and thus may have a more pronounced impact, at younger ages (Freund & Baltes, 2005; Kehr, 2003).

The processes related to multiple goal coordination are of particular importance during early adolescence. An increase in social and peer-related interests during the middle school transition makes balancing social and academic goals of pivotal importance (Brown, 1989). During adolescence, peers provide companionship and entertainment, help with problem solving, offer personal validation and emotional support, and provide a foundation for identity development (Parker & Asher, 1993). Wentzel (2004) also highlighted the positive relationship between peers and a range of positive academic accomplishments. Therefore, one should not simply say that students should focus more, or even exclusively, on academic goals. The most successful young adolescents, who display the highest levels of well-being, will be able to coordinate both social and academic goals that are conducive to higher academic performance.

Students must develop autonomy and new personal goals at this critical time of their lives, while still regulating their behaviors in ways that are desirable in a classroom setting (Brown, 1989; Wentzel, 2013). As much of the social developmental literature suggests, success in school during early adolescence depends largely on the extent to which students can coordinate their own personal needs and goals with the needs and goals of others. Students who cannot do so will likely experience poorer social and academic outcomes (Wentzel, 2000, 2013).

**Conclusion**

Goal coordination involves a process that includes self-regulation efficacy and perceptions of inter-goal interference and facilitation, and produces a unique effect on academic performance. For instance, inter-goal relations may have a unique moderating effect on the relationship between self-regulation efficacy, goal content, and academic performance. Specifically, the positive relationship between certain goals and academic performance should vary as a function of an individual's perceptions of inter-goal interference or facilitation. Goals that contribute to better academic performance should be maximally adaptive if an individual perceives that they facilitate, and do not interfere with, one another. Further, it seems that students must not only see their goals as related, but also believe that they are capable of executing regulating behaviors that will help them achieve those goals. Objectives that are in direct conflict present a unique problem for goal coordination.

It seems necessary, therefore, to ask a simple question: How can we examine these self-processes in concert with understanding the mechanisms involved in multiple goal pursuit? First, as in this study, there must be a shift back in the direction of the idiographic approaches initiated by Ford (1992), Wentzel (1993b), and others over 20 years ago. The content view will help goal researchers to account for the variance encountered when evaluating students' academic performance that is attributable to the multiple types of social goals students adopt. This perspective allows for a more complex examination of how goals and self-processes interact, which remains a central, unexplained factor in efforts to understand why students pursue varied goal sets.

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Further, given that boys and girls display different levels of social and academic behaviors and goal pursuit, this researcher was careful to control for gender. Research suggests that girls are more likely than are boys to pursue prosocial and social responsibility goals (i.e., integrative goals), and that boys are more likely than are girls to pursue goals for external reasons (e.g., performance goals; Giota, 2002; Patrick & Ryan 1997; Wentzel 1991; Wentzel et al., 2012; Wentzel et al., 2007). Boys are also more susceptible to peer influence and are more likely to adopt the goal patterns of their peers (e.g., Shin & Ryan, 2014).

Research also indicates that minority groups might value different goals than majority groups do (e.g., Graham et al., 1998), and perceive more barriers in attaining their educational aspirations (e.g., I am likely to run into a lot of barriers as I try to achieve my goals after high school; Ojeda & Flores, 2008). In addition, the researcher selected the current sample based on evidence that younger samples (e.g., age range 20-30, mean age of 24) reported experiencing more conflict between their goals than older samples (e.g., age range 60-78, mean age of 65; Freund & Baltes, 2005; Kehr, 2003). These findings are particularly salient with the current study's much younger sample, given the stresses and responsibilities inherent in the middle school transition (e.g., changing classes, interacting with a large new group of students; Eccles & Midgley, 1989). As such, the researcher also employed race and grade level as control variables in the current study.

In sum, the multiple goal literature has yet to provide an empirical answer to questions of central importance to the construction of a more comprehensive multiple goal model: What are the processes related to a student's propensity to select goals that

facilitate academic performance in school? Does successful goal coordination and academic performance begin with having such goals, and how do perceived relationships between goals and self-regulation efficacy affect the positive impact of a specific goal set? The current study addresses some of these basic questions by examining how students' goals, perceptions of inter-goal relations, and self-regulatory efficacy relate to academic performance.

**Chapter 3: Method**

This chapter describes the design, procedure, measures, and analysis used in the current inquiry. The following questions served as a foundational guide for this research study:

1. To what extent do multiple goals, self-regulatory efficacy, and perceptions of inter-goal interference predict academic performance?

2. Does self-regulatory efficacy predict academic, social responsibility, and prosocial goals more than other goal combinations?

3. To what extent do multiple goals explain the relationship between self-regulatory efficacy and academic performance? In other words, do multiple goals mediate, or partially mediate, the relationship between self-regulatory efficacy and academic performance?

4. To what extent do perceptions of inter-goal interference and facilitation moderate the relationships between self-regulatory efficacy and multiple goals, multiple goals and academic performance, and self-regulation efficacy and academic performance?

5. Do the mediating effects of multiple goals differ for groups high or low in perceptions of inter-goal interference or facilitation?

**Design**

This single-shot correlational inquiry primarily used self-report data to answer the given research questions. As such, the main goal was to establish trends and patterns of relationships, rather than causal relationships between variables. To this end, over the course of four days at the end of the 2012-2013 academic school year, sixth, seventh, and

eighth grade middle school students completed an electronic survey that focused on their goals, self-regulation efficacy, and perceptions of inter-goal interference.

**Participants.**  The researcher recruited 665 students in the sixth (N= 293), seventh (N=226), and eighth (N=146) grades from two school districts in the Southeastern U.S. towards the end of the 2012-2013 academic year. The timing of the study made it easier for students to address questions related to perceptions of inter-goal interference because they had more opportunities to experience goal conflicts over the course of the school year. The researcher conducted final analyses using students from both school districts after establishing that data and demographics were similar across groups and grade levels (see Chapter 4).

School district 1 served 197,041 students (38.5% Caucasian, 21.5% African American, 32.5 % Hispanic, 3.3% Asian, and 0.3% American Indian), and 41,539 of these students were enrolled in middle schools. Fifty-seven percent (57%) of all students enrolled in the first school district were eligible to obtain free or reduced lunch status. The specific school in which data collection took place (i.e., School 1) served a total of 653 middle school students (28% Caucasian, 30% African American, 41% Hispanic, and 1% Asian) in the 6th (N=224), 7th (N= 225), and 8th (N=204) grades. Eighty-five percent (85%) of these students were eligible to obtain free or reduced lunch status (Federal Education Budget Project, AY2012; http://febp.newamerica.net/k12/FL/1200870).

The second school district served 40,496 students (49.7% Caucasian, 35.3% African American, 4.9% Hispanic, 2.6% Asian, and 0.9% American Indian), and 10,022 of these students were enrolled in middle schools. Sixty-two percent (62%) of all enrolled students were eligible to obtain free or reduced lunch status. The specific school where

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data collection took place (i.e., School 2) served 846 middle school students (26% Caucasian, 66% African American, 4% Hispanic, 4% Asian, and 1% Other) in the sixth (N=268), seventh (N=259), and eighth (N=318) grades. Ninety-two percent (92%) of these students were eligible to obtain free or reduced lunch status (Federal Education Budget Project, AY2012; http://febp.newamerica.net/k12/FL/1200870).

The sample primarily included African-American (54%) students, with significantly smaller numbers of Caucasian (19.7%), Hispanic (14.4%), Asian (1.5%), and Indian (1.1%) students. Seventy-one students did not report their ethnicities (10.7%; see Table 1). Gender distribution of the total sample was nearly equal: 49% of students participants were male, and 51% were female.

Table 1

*Numbers and Percentages for Demographic Variables for Total Sample*

|  |  | N | Percent |
|---|---|---|---|
| Gender | Male | 326 | 49 |
|  | Female | 339 | 51 |
| Grade | 6th | 293 | 44.1 |
|  | 7th | 226 | 34 |
|  | 8th | 146 | 22 |
| Race |  |  |  |
|  | White | 129 | 19.4 |
|  | African American | 337 | 50.7 |
|  | Hispanic | 96 | 14.4 |
|  | Non-Hispanic Black | 15 | 2.3 |
|  | Asian | 10 | 1.5 |
|  | Indian | 7 | 1.1 |
|  | Other | 71 | 10.7 |
| Parent Education Level |  |  |  |
| Mother | Did not graduate | 86 | 12.9 |
|  | High school or higher | 378 | 59.9 |
| Father | Did not graduate | 56 | 8.4 |
|  | High school or higher | 290 | 43.6 |
| Total |  | 665 |  |

*Note:* $N = 183$ for School 1*; N = 482* for School 2*; "I don't know" N = 201* for mothers; *N = 319* for fathers.

Given that the researcher did not have effect sizes from previous research from which to calculate sample size, she used a range of scenarios with estimates and looked at a range of different suggested sample sizes. Previous explorations of inter-goal relations utilized samples ranging from total $N = 81$ (Riediger & Freund, 2008) to total $N = 160$ (Riediger & Freund, 2006). Goal content work has used larger samples that have varied from $N = 203$ (Wentzel, 1989) to $N = 339$ (Wentzel, Filisetti & Looney, 2007). Studies of self-regulatory efficacy have also used larger samples ranging from $N = 1180$ (Pastorelli et al., 2001), across smaller sub-samples in Italy, Hungary, and Poland, to $N = 464$ (Bandura et al., 2003).

The researcher originally calculated sample size ranges to include four predictors—total multiple goal score, self-regulation efficacy score, interference score, and a facilitation score—and four control variables—gender, ethnicity, parental education level, and free and reduced lunch status. In each iteration, alpha was set to .05, desired power was .80 or .90, and effect sizes were estimated at .15, .10, and. 08 using an a-priori test for a single standardized regression coefficient. The researcher calculated the second regression using the same parameters and included nine predictors: six goal content scores, self-regulation efficacy, interference score, a facilitation score and the four control variables. The researcher decided to set small effect sizes in light of similar effect sizes found in the social science literature.

A prior power analysis calculated using G Power *3 indicated that a model employing the first set of parameters needed a minimum sample size of 196 (i.e., α =.05, power set at .80, and effect size of .08). A minimum sample size of 235 was necessary for the second model. The sample size of 665 exceeded the number suggested by sample size

estimates. However, the final model used in the current study included 18 parameters. Post-hoc power analyses indicated that power remained excellent given the sample size in the final model and resulted in a 1.0 power level (Cohen, 1988, 1992).

**Procedures.** The researcher contacted school districts and principals to identify and recruit schools and classrooms for participation in the study. The target school districts approved the involvement of two schools where a total of 23 sixth grade, 20 seventh grade, and five eighth grade classrooms participated in the study. The researcher sent information home to parents that described the study and asked for parental consent in School 1 ($N = 90$ for non-consent). In School 2, the researcher used passive consent in lieu of active consent at the suggestion of the school's principal and as documented in the project's IRB. Therefore, only teachers in School 1 collected consent forms returned by students. Teachers in School 1 awarded students extra credit points as an incentive for participation. However, all students were eligible for extra credit regardless of final participation status. Both schools also received candy or an ice cream party as an incentive for participation. The researcher informed all students from both schools that they could withdraw or not start the survey at any time without penalty, as documented in the IRB.

The researcher administered an electronic survey during regular school hours in May of 2013 to those individuals that chose to participate and received parental consent (for School 1). All students in School 2 participated (with the exception of students whose parents returned forms stating they *did not* want their children to participate or students who were absent on the day of the survey). A research assistant helped collect

data at School 2. The teacher remained in the classroom or was present in the computer room with the students during all data collection sessions in both schools.

The researcher presented the study as a survey of what students do while they are in school, and then briefed students about confidentiality and their option to withdraw from participation at any point during the study. Each survey included a unique identification code that helped to ensure confidentiality. Additionally, on the day of data collection, all participating students signed assent forms that described the study and detailed confidentiality procedures. To minimize distractions, students who did not obtain parental permission or who chose not to participate in the study sat in a separate area of the classroom, or moved to an alternative location, as necessary. Teachers determined what non-participating students did during data collection (e.g., working on homework or other assignments).

**Measures.** This section details the measures used to obtain information from students. Appendix A provides a full list of survey items and the computerized survey as they appeared to students.

*Multiple goal pursuit.* To follow is a description of the measurement strategy for assessing multiple goal pursuit. Multiple goal factor scores were obtained using an exploratory factor analysis based on goal content assessment.

*Goal content.* In the current study, the researcher measured goal content by providing students with a Likert scale to rate the extent to which they pursued 18 goals that represented common school-related outcomes derived from Ford's (1992) Taxonomy of Human Goals. Each of the 18 goals fell into one of six categories and consisted of three goal statements: (a) *affective outcomes* (e.g., "How often do I try to do this at

school?" have fun, feel happy), (b) *academic outcomes* (e.g., "How often do I try to do this at school?" get good grades, learn something new), (c) *autonomy-related outcomes* (e.g., "How often do I try to do this at school?" feel free to make my own decisions and choices, feel unique and special), (d) *interpersonal outcomes* (e.g., "How often do I try to do this at school?" make friends, have good relationships with friends), (e) *social responsibility outcomes* (e.g., "How often do I try to do this at school?" follow rules, pay attention), and (f) *prosocial outcomes* (e.g., "How often do I try to do this at school?" share with others, help others). Students reported the extent to which they pursued all 18 goals at school (e.g., "How often do I try to do this [particular goal] at school?"; 1 = "*Not at all*" to 6 = "*Always*"; Ford, 1992).

Ford originally developed the taxonomy as a list of goal themes, rather than as a list of all the possible goals that an individual can pursue. These themes emerged from clinical interviews in adult samples and did not draw from previous motivational taxonomies (M. Ford, personal communication, November 7, 2013). Based on prior research, the present researcher determined that three goals within six broader goal categories (i.e., academic, affective, autonomy, social responsibility, prosocial, and interpersonal goals) were relevant to school-aged children and thus were applicable to this study (pilot study, Wentzel et al. 2010).

However, given that the participants in this sample were mostly low-income, minority adolescents, it was important to note that the themes that organized their goals could deviate from the aforementioned traditional taxonomy established by Ford (1992). For example, Wentzel (2004) found a close and consistent relationship between the academic and social goals of adolescents. The goals of "getting good grades" and

"following rules" might not be thematically distinct in the adolescent's world. Further, low-income and minority students experience familial environments with a strong emphasis on obedience, which could result in the perception that goals to "follow rules" and "get good grades" are one in the same (e.g., Berk, 2008; Bluestone & Tamis-LeMonda, 1999; Brody & Flor, 1998; Carroll et al., 2013). The same was true for an alternative thematic organization for all goals of interest in this study. For example, one could link autonomy goals to affective goals or interpersonal goals in this sample. In fact, a number of combinations were possible.

In light of these considerations, the researcher deemed an exploratory (vs. confirmatory) factor analysis to be most appropriate in obtaining a factor goal structure. The investigator them used these factor scores as multiple goal factor scores in regression models and analyses.

*Self-regulation efficacy.* Self-regulation efficacy represented students' beliefs about their capacity to engage in academic learning behaviors. This measure was selected given that the outcome of interest in the current study was academic performance (GPA).

*Efficacy for self-regulated learning (academic).* The researcher measured the perceived efficacy for the regulation of academic behaviors using a seven-item sub-scale of Bandura's (1990) Children's Perceived Self-Efficacy (CPSE) scale that employs a five-point Likert scale (e.g., "How well can you concentrate while in class?"; 1 = *very well* and 5 = *not at all well*). In previous works, Cronbach's alpha coefficients have ranged from .80-.89 (Bandura, 1990, Bandura et al., 2003; Pastorelli, 2001). The

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researcher calculated scores by averaging the sum of all item responses. Cronbach's alpha for this scale in the current sample was .79.

**Perceptions of Inter-goal relations.** A version of Riediger's (2001) Inter-goal Relations Questionnaire, adjusted for clarity and understanding in the current age sample, measured perceptions of inter-goal relations. Separate scores were calculated for perceptions of interference and facilitation between goals.

*Goal interference and facilitation.* The researcher assessed inter-goal relations using an adapted version of Riediger's (2001) Inter-goal Relations Questionnaire (IRQ). Several studies have employed the scale and revealed that the tool has sound psychometric properties for both the inter-goal interference composite (Cronbach's $\alpha$ = .94; 94) and the inter-goal facilitation composite (Cronbach's $\alpha$ = .90; 91; Riediger & Freund, 2004; Riediger, Freund, & Baltes, 2005, respectively). The samples in these studies varied in age, usually containing an older adult (e.g., mean age 65) and young adult sample (e.g., mean age 24).

Students in the current study's sample first received a drop-down menu goal bank for assessing top goal (i.e., most important goal) pursuit and goal content. This menu contained the 18 goals described above. Students then selected the three activities (i.e., goals) that they believed they pursued at school in order of importance (see Appendix A). Tables 5-7 detail the students' responses by category as part of the descriptive analysis. The researcher chose to use the word "activity" in place of the word "goal" was made for ease of comprehension. In the past, studies have employed measures using similar language when referring to goals in young adolescents (e.g., Wentzel, 1996; Wentzel et al., 2012).

Students then answered eight Likert-scale items determined by the two first goal choices that they selected from the drop-down menu. For example, if they chose "Get good grades" and "Have fun" as their first two goal choices (i.e., top two goals), they would proceed to a screen where those goals were automatically inserted into the next set of questions rated on a 6-point Likert Scale by surveymonkey.com (e.g., "How often does trying to [inserted Activity # 1, Top Goal 1] at school make you spend less time trying to [inserted Activity #2, Top Goal 2] at school?"; 1= *"Not at all"* to 6 = *"Always"*).

The survey presented the top two goals as both Activity 1 and Activity 2. For example, after answering the question, "How often does trying to 'get good grades' at school make you spend less time trying to do 'have fun' at school?" they would then respond to, "How often does trying to "have fun" at school make you spend less time trying to "get good grades" at school?"; 1= *"Not at all"* to 6 = *"Always"* 1= *"Not at all"* to 6 = *"Always"* (see Appendix A for the full computerized survey as it appeared to students).

Item content provided further definition for two the inter-goal relation scores. Specifically, for the interference sub-scale, items 1 and 3 reflected interference with regard to *time constraints*, items 2 and 4 reflected interference in regard to *energy constraints*, and items 6 and 8 reflected interference due to *incompatible goal attainment strategies*. For the facilitation subscale, items 5 and 7 referred to *overlapping goal attainment strategies*. In line with the approach used in previous research, the researcher calculated two sub-scale scores by averaging responses across the items within the interference and facilitation sub-scales. The interference score included six items (1, 2, 3,

4, 6, 8), and the facilitation score included two items (5 and 7; Riediger, 2001). In this sample, Cronbach's alpha for the interference scale was .82 and .76 for facilitation.

*Academic performance.* Student's composite GPA across all classes represented academic performance. The outcome of interest in the current study was overall academic performance and not specific within domain performance (e.g., in science or math)

*GPA.* The researcher assessed academic performance using students' cumulative GPAs across all academic subject areas and obtained these data from school records. In other words, included grades in science, math, social studies, English, etc.

*Control variables.* Differences in motivation and goal pursuit by gender, grade level and race have been documented in the literature. As such, control variables in regression analyses included gender, grade level, and race.

- *Gender.* Students self-reported whether they were male or female (coded 1 and 2, respectively).

- *Race.* Students also self-reported their ethnic background (White, African American, Hispanic, Non-Hispanic Black, Asian, Indian, or Other).

- *Grade.* This variable represented a student's current grade level as $6^{th}$, $7^{th}$, or $8^{th}$ grade.

- *Parent education level.* Students self-reported whether their mother and father completed high school (coded as Yes =1 or No =0).

**Analysis plan.** This section details the analysis plan used in the current study. The researcher began by arraying descriptive statistics and bivariate correlations between variables, and then ensured the data met the assumptions of a general linear model. This check included an inspection of outliers and of normality in the data distribution.

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Specifically, the researcher used a box-and-whisker plot, a QQ-plot, and the Shapiro-Wilk test (non-parametric test) to assess normality, then established the presence of heteroscedasticity using a plot of the predicted values (e.g., GPA) against the residuals. Finally, the researcher tested linearity assumption by inspecting pairwise plots of the residuals in relation to each independent variable.

The main sets of analyses in this study were an exploratory factor analysis to determine multiple goal factor scores and two regression models used to test simple mediation and moderated mediation. The researcher determined factor scores using a maximum likelihood factor analysis and employed oblique rotation to obtain a factor goal structure.

The researcher used Hayes' (2013) PROCESS software to create two regression models. The first model (i.e., simple mediation) detected the effects of self-regulation on academic performance when taking into account student goals. The second model (i.e., moderated mediation) examined the conditional effects of self-regulation efficacy on multiple goal pursuit and academic performance while taking into account levels of inter-goal interference and facilitation. Chapter 4 provides a detailed explanation of these procedure and results.

The researcher used a regression-based path analysis to test the proposed mediating effects of multiple goals and the moderating effects of perceptions of inter-goal interference (see Figures 3 and 4). The researcher conducted all analyses using PROCESS software (Hayes, 2013). Figure 3 details the effects of self-regulation efficacy on multiple goals, the effects of multiple goals on academic performance, and the effects of self-regulation efficacy on academic performance via multiple goals (Research

questions 1, 2, and 3).

$$e_{m_i}$$
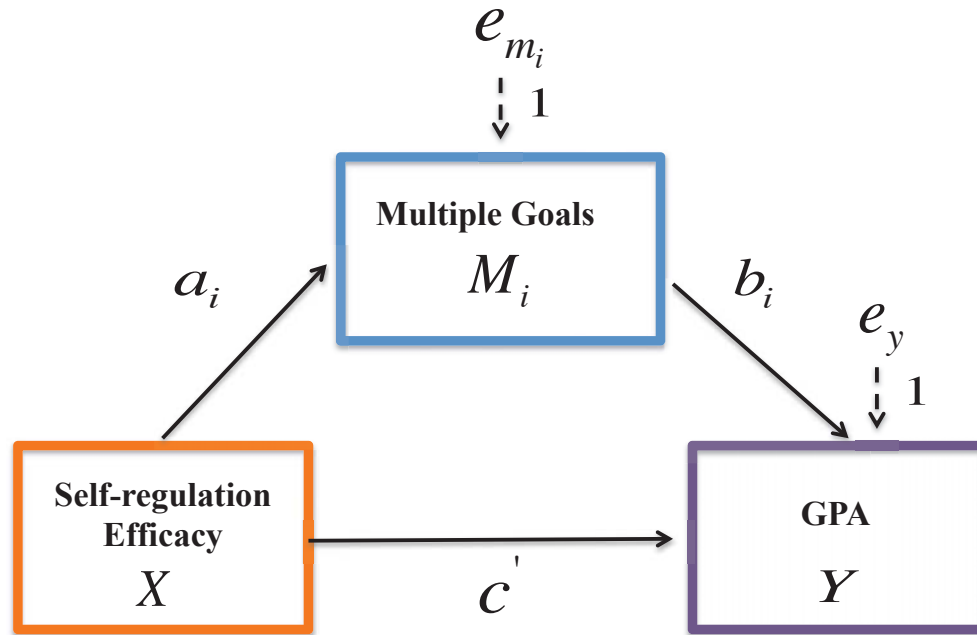


**Indirect effect** of $X$ on $Y$ through $M_i = a_i b_i$
**Direct effect** of $X$ on $Y = c'$

Figure 3. Multiple Regression model of simple mediation

The second model, depicted in Figure 4, accounted for the moderating effects of perceptions of inter-goal interference on the aforementioned simple mediation model (moderated mediation; Research questions 4 and 5; Hayes, 2013). There are three sub-models represented in this moderated mediation regression model. The first model tested whether perceptions of inter-goal interference and facilitation moderated the relationship between self-regulation efficacy and academic performance. Of interest in this model is an estimate and test of the significance of paths $c'_4$ and $c'_5$. The second sub-model addressed whether perceptions of inter-goal relations moderated the effect of self-regulation efficacy on multiple goals (the estimate and test of paths $a_{4i}$ and $a_{5i}$). Finally, the third model estimated the conditional indirect effect of self-regulation efficacy on

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academic performance through multiple goals on academic performance, quantified as

the product of the function of paths $a_{1_i}$ ; $a_{4_i}W$ and $a_{5_i}Z$ ; and $b_{1_i}$ , $b_{2_i}W$ , and $b_{3_i}Z$ (Pollack,

Van Epps, & Hayes, 2012). Scores for self-regulation efficacy, perceptions of inter-goal

interference and facilitation, and GPA were mean centered for analyses.
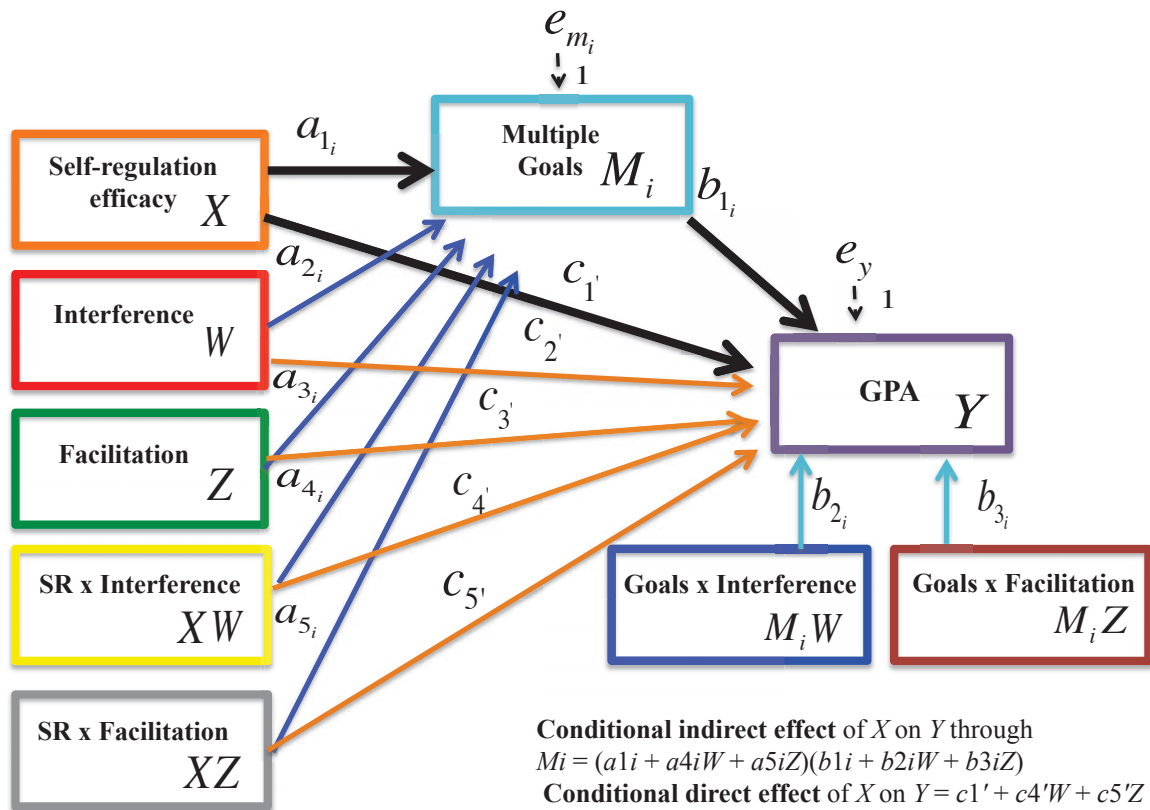


Figure 4. Multiple-regression model of moderated mediation.

**Multiple regression analyses: Moderated mediation.** The researcher used

factor scores in all multiple regression models that addressed research questions 1-5.

There are several reasons for utilizing the Hayes (2013) moderated mediation regression

model instead of testing individual causal pathways for both moderation and mediation

(i.e., Baron & Kenny, 1986). The first rationale is that this method examines how the

mediated paths linking self-regulation efficacy (*X*) and multiple goal pursuit (*M*) to

academic performance (*Y*) can vary as a function of the moderating variable of inter-goal-

relations ($W$ and $Z$; Hayes, 2013). In other words, both the direct ($c'$) and indirect paths ($a_i b_i$) in the model can vary due to the effect of inter-goal relations ($a1i + a4iW + a5iZ$)($b1i + b2iW + b3iZ$).

Separately examining the moderating effect of inter-goal relations on the relationship between multiple goals and academic competence, does not take into account these alternative pathways of influence (i.e., via conditional direct and indirect effects). In addition, the PROCESS software accounts for more than one mediator and moderator, along with covariates, in a single model.

Major analyses consisted of two separate regression models: a simple moderation model and a conditional effects model. The researcher compared these models to determine total variance, as well as direct and indirect effects. The first model tested simple mediation and included the following predictors: the total multiple goal factor score (three mediators) and the self-regulatory efficacy scale score ($X$). The second model tested moderated mediation and contained the multiple goal scores (three mediators), self-regulatory efficacy scale scores ($X$), and the inter-goal relations mean sub-scores for interference and facilitation as predictors ($W$ and $Z$, respectively). The researcher ran both models using GPA as the dependent variable (Y) and included three control variables (gender, grade, and race).

**Summary**

The proposed study utilized data collected from sixth, seventh, and eight grade classrooms in the Southeastern U.S. to explore the relationship between multiple goal pursuit and academic performance. Examining underlying self-processes including self-regulatory efficacy and perceptions of inter-goal relations helped to clarify whether

certain goal combinations were more predictive of academic performance than were others. Each research question examines the unique and combined influence of multiple goal pursuit, self-regulatory efficacy, and inter-goal relations on academic performance. The researcher synthesized the results from the analyses to form a complete picture of the interrelations among the selected variables. Chapter 4 details these relationships.

**Chapter 4: Results**

This study examined the relationship between multiple goals, self-regulation efficacy, inter-goal relationships, and academic performance. The researcher tested relationships within a theory-driven conceptual model using a moderated mediation multiple regression path analysis. This chapter provides a description of the data and presents the research findings. The chapter begins with an examination of normality and linearity assumptions, followed by descriptive analyses of central tendency, variability, and bivariate correlations. The chapter then details the results of the exploratory factor analyses and concludes with the core findings guided by the conceptual model(s) using multiple regression path analyses.

**Model Assumptions**

This section discusses assumptions regarding missing data, normality, outliers, linearity, independence of residuals, and homoscedasticity. This discussion is followed by an explanation of descriptive analyses.

**Missing data.** Due to the nature of the computerized survey, there were no missing cases. Students needed to provide an answer for each question before moving on to the next section. However, GPA data was missing from the school records of 10 students. As a result, all analyses that include GPA as a variable have an $N =655$ instead of an $N=665$.

**Normality and outliers.** Multivariate outlier detection procedures suggested the presence of outliers (i.e., standardized variables exceeding +/-3.0); however, the researcher decided to retain these cases. Outliers can be truly aberrant observations, or they can simply reflect unique phenomena in the population examined. In this study,

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there was an indication that the encountered cases could reflect valid sub-group scores in the population. For example, extremely high or low scores on certain goals could affect factor structures in ways relevant to the research questions (SPSS Training Manual, 2006).

The researcher calculated the skew and kurtosis values for each scale and individual goal to examine normality. Kurtosis is a measure of the "peakedness" of a distribution. Values near zero indicate a shape close to normal, and values +/- 1 are very good for most psychometric uses, although values of +/- 2 are also acceptable. Large negative values indicate a very flat distribution and high positive values indicate a very "pointed" distribution, neither of which is desirable (Illinois State University, 2014). Skewness measures the extent to which a distribution of values deviates from symmetry around the mean. Values of zero indicate a symmetric distribution. Positive values indicate a greater number of smaller values, and negative values indicate a greater number of larger values. As with Kurtosis, values of +/-2 are acceptable indicators of normality. Table 2 details the normality statistics for the data. All values were less than +/-2, indicating a normal distribution for all scales and goals.

Table 2

*Skewness and Kurtosis of Self-regulation efficacy, Inter-goal relations, GPA and Goals*

|  | Skewness | Kurtosis |
| --- | --- | --- |
| Self-regulation efficacy | 0.12 | -0.56 |
| Interfere | 0.91 | 0.25 |
| Facilitate | 0.10 | -1.28 |
| GPA | -0.37 | 0.05 |
| Goals |  |  |
| Feel happy | -0.36 | -0.45 |
| Pay attention | -0.26 | -0.61 |
| Make friends | -0.72 | -0.56 |
| Learn new things | -0.67 | -0.51 |
| Cheer up a classmate who is sad | -0.16 | -1.11 |
| Be challenged | -0.11 | -0.91 |
| Have fun | -1.14 | 0.47 |
| Follow rules | -0.46 | -0.70 |
| Be part of a popular group | 0.14 | -1.35 |
| Give help to my classmates | -0.09 | -0.82 |
| Feel relaxed with no stress | -0.10 | -0.96 |
| Share with my classmates | -0.05 | -0.83 |
| Feel unique and special | -0.53 | -0.95 |
| Get good grades | -0.51 | -0.68 |
| Have good relationships with my friends | -1.13 | 0.66 |
| Listen to my teacher | -0.50 | -0.56 |
| Make my own decisions and choices | -1.03 | 0.15 |
| Feel confident about myself | -1.49 | 1.41 |

*Note:* Standard Error for Skewness was .10 and .19 for Kurtosis values.  N = 665; for all other variables.

**Linearity and independence of residuals.** Ordinary least squares regression (OLS) models require that the relationship between predictor variables X and the dependent variable Y is linear in nature. This assumption implies that a given value of X always varies by one unit in relation to the outcome Y. If this is not the case, then the estimated relationship is non-linear (e.g., quadratic, exponential; Hayes, 2013). Non-linearity would be evident, for example, if a case with a value of X=2 is, on average, 3 units higher, in relation to Y, than cases where X=1; while cases where X=3 are two units higher on Y than cases where X=2. The same concept applies to the estimation of errors.

One must assume they are independent, meaning that for all $(i,j)$ pairs of observations, there is no information contained in the error estimation for case $i$ that could aid in approximating the error estimation for case $j$ (Hayes, 2013).

Figures 18-26 in Appendix B present residual plots depicting linearity. Because there were factors that served as both independent and dependent variables, the tables include three sets of residuals plots. In the first set, the researcher used self-regulation efficacy to predict multiple goal scores and GPA. In the second set of plots, multiple goal scores served as predictors of GPA. In the third set of plots, the researcher used perceptions of inter-goal relations to predict GPA. The figures indicated that there is support for the assumption of linearity, and that no transformations are necessary.

**Homoscedasticity.** The assumption of homoscedasticity implies that the standard deviations of the error terms are constant and do not depend on different values of the independent (X) variable. In other words, each probability distribution for GPA (Y) should have the same standard deviation, regardless of the values of predictor variables (X). A visual inspection of residual and P-plots using GPA as the dependent variable suggested that the assumption of homoscedasticity was met (Figure 5). Data should not "fan" out in the scatter plot, and the line around the fit-line in the P-plot is very tight, indicating equality of residual variances and different values of X (Figure 6). As such, the researcher determined that visual inspection provided sufficient evidence of homoscedasticity.

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Scatterplot
Dependent Variable: Zscore(GPA)
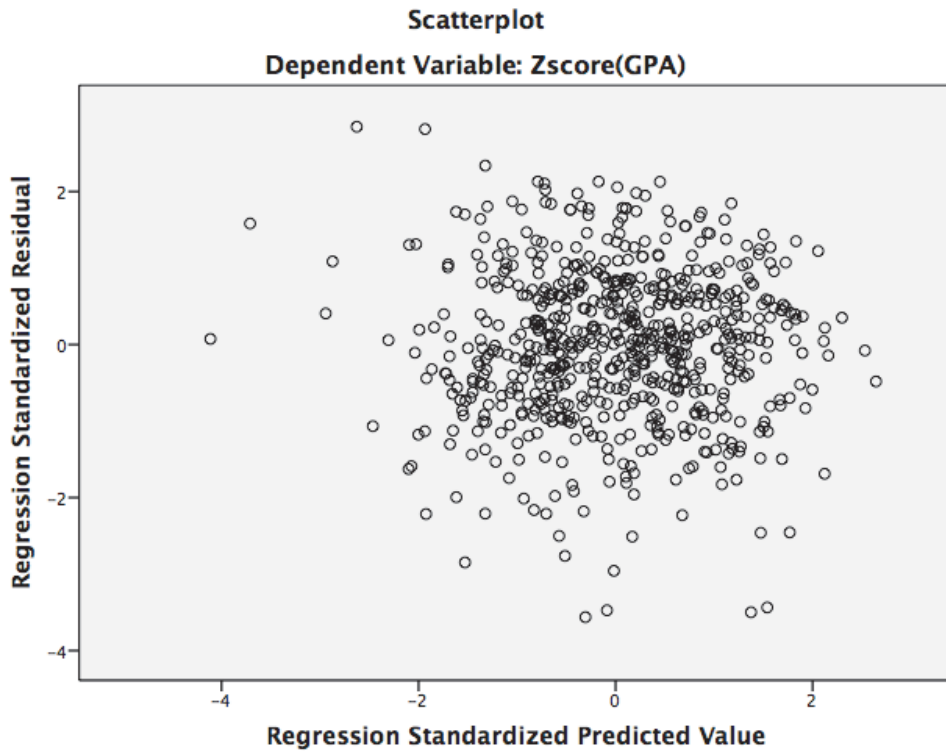
Figure 5. Residual and P-plot with GPA as dependent variable.
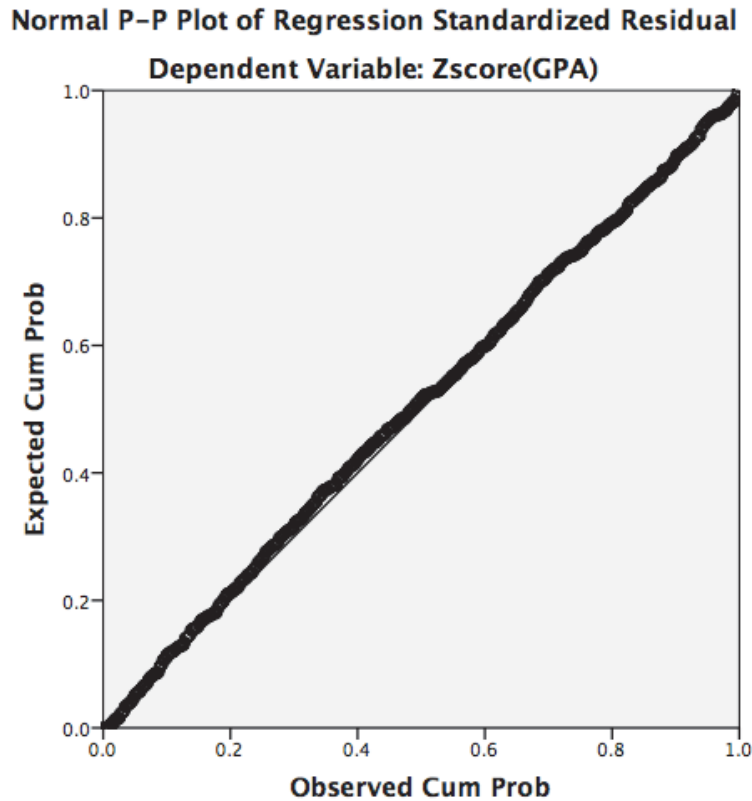
Figure 6. P-plot of residuals for GPA as the dependent variable.

**Descriptive Analyses**

This section presents descriptive information for all variables. Table 3 depicts the means and standard deviations of all continuous variables. These analyses included all available cases.

**Means and standard deviations.** The researcher used measures of central tendency to indicate higher and lower levels for each scale variable and calculated means across all variables and scale scores. Standard deviation scores examine the variability of scores, with smaller deviations indicating less variability in scores. The researcher merged data for School 1 and School 2 for all analyses after determining that the relationships between variables were similar across schools (see Tables 2a-3c in Appendix B), and later entered grade level as a control variable in analyses. Table 3

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depicts both means and standard deviations for all variables, and Table 4 presents

frequencies for each of the 18 goals.

Table 3
*Means and Standard Deviations for Self-regulation Efficacy, Inter-goal relations, GPA and all 18 Goals*

|  | Mean | SD | Range |
|---|---|---|---|
| Variable |  |  |  |
| Self-regulation efficacy | 18.14 | 5.18 | 6.14 - 30.7 |
| Interference | 11.53 | 5.56 | 5.17 - 30.5 |
| Facilitation | 5.33 | 2.47 | 1.5 - 9.0 |
| GPA | 2.63 | 0.64 | 0.43 - 4.0 |
| Goals |  |  |  |
| Feel happy | 4.34 | 1.20 | 1-6 |
| Pay attention | 4.29 | 1.19 | 1-6 |
| Make friends | 4.59 | 1.46 | 1-6 |
| Learn new things | 4.78 | 1.23 | 1-6 |
| Cheer up | 3.88 | 1.61 | 1-6 |
| Be challenged | 3.75 | 1.55 | 1-6 |
| Have fun | 5.00 | 1.27 | 1-6 |
| Follow rules | 4.30 | 1.36 | 1-6 |
| Be part of a popular group | 3.30 | 1.83 | 1-6 |
| Give help to my classmates | 3.95 | 1.42 | 1-6 |
| Feel relaxed with no stress | 3.76 | 1.54 | 1-6 |
| Share with my classmates | 3.78 | 1.45 | 1-6 |
| Feel unique and special | 4.28 | 1.66 | 1-6 |
| Get good grades | 4.66 | 1.19 | 1-6 |
| Have good relationships | 4.91 | 1.26 | 1-6 |
| Listen to my teacher | 4.45 | 1.30 | 1-6 |
| Make my own decisions | 4.85 | 1.36 | 1-6 |
| Feel confident about myself | 5.09 | 1.33 | 1-6 |

*Note: N* = 665.

Table 4
*Goal Frequencies by Category*

| | Never N (%) | Seldom N (%) | Sometimes N (%) | Often N (%) | Almost Always N (%) | Always N (%) |
|---|---|---|---|---|---|---|
| *Affective Goals* | | | | | | |
| Feel Happy | 11 (1.7) | 23 (3.5) | 142 (21.4) | 168 (25.3) | 192 (28.9) | 129 (19.4) |
| Feel relaxed | 62 (9.3) | 76 (11.4) | 169 (25.4) | 130 (19.5) | 110 (16.5) | 118 (17.7) |
| Have fun | 10 (1.5) | 24 (3.6) | 60 (9) | 109 (16.4) | 120 (18) | 342 (51.4) |
| *Social Responsibility Goals* | | | | | | |
| Pay attention | 9 (1.4) | 22 (3.3) | 165 (24.8) | 156 (23.5) | 197 (29.6) | 116 (17.4) |
| Follow rules | 18 (2.7) | 47 (7.1) | 143 (21.5) | 113 (17) | 196 (29.5) | 148 (22.3) |
| Listen to my teacher | 13 (2) | 32 (4.8) | 130 (19.5) | 133 (20) | 183 (27.5) | 174 (26.2) |
| *Prosocial Goals* | | | | | | |
| Cheer up classmate | 60 (9) | 77 (11.6) | 163 (24.5) | 100 (15) | 112 (16.8) | 153 (23) |
| Share with classmate | 47 (7.1) | 65 (9.8) | 204 (30.7) | 125 (18.8) | 117 (17.6) | 107 (16.1) |
| Give help to classmate | 33 (5) | 52 (7.8) | 200 (30.1) | 139 (20.9) | 110 (16.5) | 131 (19.7) |
| *Academic Goals* | | | | | | |
| Be challenged | 68 (10.2) | 62 (9.3) | 179 (26.9) | 134 (20.2) | 100 (15) | 122 (18.3) |
| Get good grades | 4 (0.6) | 14 (2.1) | 123 (18.5) | 125 (18.8) | 196 (29.5) | 203 (30.5) |
| Learn new things | 6 (0.9) | 15 (2.3) | 104 (15.6) | 130 (19.5) | 147 (22.1) | 263 (39.5) |
| *Autonomy Goals* | | | | | | |
| Make my own decisions | 18 (2.7) | 26 (3.9) | 83 (12.5) | 91 (13.7) | 143 (21.5) | 304 (45.7) |
| Feel unique and special | 57 (8.6) | 48 (7.2) | 127 (19.1) | 87 (13.1) | 111 (16.7) | 235 (35.3) |
| Feel confident | 21 (3.2) | 19 (2.9) | 57 (8.6) | 63 (9.5) | 127 (19.1) | 378 (56.8) |

*Note:* Total $N$ = 665. Percentages are shown in parentheses. Table continues on next page.

Table 4
*Goal Frequencies by Category Continued*

| *Interpersonal Goals* | Never N (%) | Seldom N (%) | Sometimes N (%) | Often N (%) | Almost Always N (%) | Always N (%) |
|---|---|---|---|---|---|---|
| Have good relationships with my friends | 14 (2.1) | 19 (2.9) | 68 (10.2) | 98 (14.7) | 176 (26.5) | 290 (43.6) |
| Make new friends | 21 (3.2) | 50 (7.5) | 92 (13.8) | 117 (17.6) | 125 (18.8) | 260 (39.1) |
| Be part of the popular group | 171 (25.7) | 77 (11.6) | 124 (18.6) | 89 (13.4) | 82 (12.3) | 122 (18.3) |

*Note:* Total $N$ = 665. Percentages are shown in parentheses.

Table 5 presents frequencies for the goals students selected as their "Most Important Goal" (i.e., Top Goal). Table 6 presents differences in the frequencies for Top Goal by grade level. Of interest in Table 6 are differences in the rate of pursuit for most important goals by category as a function of grade level. In general, sixth graders were more likely to report pursuing one of the academic goals (i.e., get good grades, learn something new, be challenged) than seventh or eighth graders. Nevertheless, respondents selected this goal category as the "Most Important Goal" across grade levels.

Table 5
*Top Goal Frequencies*

|  | Top Goal 1<br>N (%) | Top Goal 2<br>N (%) | Top Goal 3<br>N (%) |
|---|---|---|---|
| Goals |  |  |  |
| Feel Happy | 36 (5.4) | 27 (4.1) | 41 (6.2) |
| Pay attention | 85 (12.8) | 85 (12.8) | 44 (6.6) |
| Make friends | 28 (4.2) | 59 (8.9) | 41 (6.2) |
| Learn new things | 51 (7.7) | 60 (9) | 35 (5.3) |
| Cheer up classmate | 5 (0.8) | 7 (1.1) | 8 (1.2) |
| Be challenged | 10 (1.5) | 19 (2.9) | 16 (2.4) |
| Have fun | **103 (15.5)** | **88 (13.2)** | 69 (10.4) |
| Follow rules | 21 (3.2) | 33 (5) | 24 (3.6) |
| Be popular | 14 (2.1) | 18 (2.7) | 20 (3) |
| Give help | 2 (0.3) | 5 (0.8) | 4 (0.6) |
| Feel relaxed | 19 (2.9) | 24 (3.6) | 35 (5.3) |
| Share | 1 (0.2) | 3 (0.5) | 0 |
| Feel unique | 9 (1.4) | 16 (2.4) | 29 (4.4) |
| Get good grades | **189 (28.4)** | **100 (15)** | **110 (16.5)** |
| Have good relationships | 14 (2.1) | 33 (5) | 30 (4.5) |
| Listen to my teacher | 23 (3.5) | 25 (3.8) | 46 (6.9) |
| Make my own decisions | 23 (3.5) | 28 (4.2) | 43 (6.5) |
| Feel confident | 32 (4.8) | 35 (5.3) | **70 (10.5)** |

*Note: N*= 665. The top two percentages within each Top goal category are highlighted.

Table 6
*Frequency Table for Top Goals by Category and Grade*

|  | 6th grade N(%) | 7th grade N(%) | 8th grade N(%) |
|---|---|---|---|
| Top Goal |  |  |  |
| **Academic** | **181 (27.2)** | **130 (19.5)** | **96 (14.4)** |
| Social responsibility | 90 (13.5) | 72 (10.8) | 49 (7.4) |
| Prosocial | 38 (5.7) | 32 (4.8) | 24 (3.6) |
| Interpersonal | 109 (16.4) | 76 (11.4) | 33 (5.0) |
| **Affective** | **119 (17.9)** | **103 (15.5)** | **75 (11.3)** |
| Autonomy | 79 (11.9) | 66 (9.9) | 52 (7.8) |

*Note:* Total $Ns$ 6th grade = 293; 7th grade = 226; 8th grade = 146. N's represent the number of students who chose any one of the 3 goals within each stated category as one of their three Top Goals (i.e., Most Important Goals).

Another area of interest was whether goal pairs that student rated as interfering with or facilitating one another were likely to fall within the same goal categorization. Once students selected their top three goals, the system entered their top two choices into the computerized survey and evaluated them based on student perceptions of inter-goal interference and facilitation (see full PDF survey in Appendix A). Table 7 contains data regarding these goal pairings. In general, students were more likely to evaluate their perceptions of inter-goal interference or facilitation for goals that belonged to different categorizations. Respondents were also most likely to evaluate academic goals in relation to all other goals. This finding is not surprising given that students selected academic goals most often as a top goal. The data also indicated that respondents were more likely to evaluate academic goals in relation to social responsibility ($N = 193$) or affective ($N = 175$) goals than other goal categorizations. There were also a substantial number of students who evaluated their perceptions of inter-goal relations for combinations of social responsibility and affective goals ($N = 103$).

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Table 7

*Frequencies and Percentages of Goal Pairing Categorizations Used to Assess*
*Perceptions of Inter-goal Interference and Facilitation*

| Goal pairings | N (%) |
|---|---|
| **Within same category** | |
| Academic | 36 (5.4) |
| Social responsibility | 33 (5) |
| Prosocial | 1 (0.2) |
| Affective | 26 (3.9) |
| Interpersonal | 4 (0.6) |
| Autonomy | 11 (1.7) |
| **Across categories** | |
| *Academic vs. other* | |
| **Social responsibility** | **124 (18.6)** |
| Prosocial | 4 (0.6) |
| **Affective** | **113 (17)** |
| Interpersonal | 61(9.2) |
| Autonomy | 55 (8.3) |
| *Social Responsibility vs. other* | |
| Prosocial | 6 (0.9) |
| **Affective** | **44 (6.6)** |
| Interpersonal | 17 (2.6) |
| Autonomy | 15 (2.3) |
| *Prosocial vs. other* | |
| Affective | 6 (0.9) |
| Interpersonal | 3 (0.5) |
| Autonomy | 2 (0.3) |
| *Affective vs. other* | |
| Interpersonal | **55 (8.3)** |
| Autonomy | 27 (4.1) |
| *Interpersonal vs. other* | |
| Autonomy | 22 (3.3) |

*Note:* $N = 665$, $N = 111$ within-goal and $N = 554$ across-goal categorizations. Percentages correspond to pairings within each respective goal categorization.


**Correlation matrices.** The researcher examined the relationships between all

predictor and outcome variables with bivariate Pearson Correlations. The 18 goal

correlation tables are divided between several tables because of their size (see Tables B1-

B2 in Appendix B). Correlations of interest included a positive correlation between

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GPA, self-regulation efficacy, and goal facilitation. In addition, GPA correlated

negatively with goal interference (see Table 8).

Table 8
*Correlations for Self-regulation Efficacy, Interference, Facilitation, and GPA*

|  | Self-regulation Efficacy | Interference | Facilitation |
| --- | --- | --- | --- |
| Interference | .06 |  |  |
| Facilitation | .29** | -.10* |  |
| GPA | .11** | -.19** | .17** |

*Note: N= 655; p *< 0.05, ** p < 0.01.*

**Analysis of variance (ANOVA).** The researcher conducted a series of one-way

ANOVAs to test mean differences in the variables of interest by gender, grade, race, and

student-reported parental education level. Results indicated that females ($M = 2.76$, $SD =$

.63) averaged significantly higher GPAs than did males ($M = 2.49$, $SD = .62$); [$F$, (1,653)

= 31.93]. The analysis also revealed significant differences in mean scores on self-

regulation efficacy by grade [$F$, (2,662) =4.07], with sixth graders ($M = 18.78$, $SD =$

5.04) reporting higher levels of self-regulation efficacy on average than seventh ($M =$

17.71, $SD = 5.21$) and eighth graders ($M = 17.53$, $SD = 5.28$; Table 9). Post-hoc

comparisons using Tukey's HSD determined that there were no significant mean

differences between seventh and eighth graders with regard to self-regulation efficacy.

Students' average GPAs also differed significantly by race [$F$, (6,648) = 2.46], although

post-hoc comparisons did not detect specific group variations (see Table 10). Finally,

students who reported that their mothers had a college degree ($M = 19.30$, $SD = 4.88$)

reported significantly higher self-regulation efficacy than did students who reported that

their mother did not graduate from high school ($M = 16.96$, $SD = 5.22$); $F$, (4,660) =

3.70. The data revealed no significant differences regarding fathers' education level (see

Tables 11 and 12).

Table 9

*One-way Analysis of Variance of GPA and Self-regulation Efficacy and Inter-goal relations by Gender and Grade Level*

| | Gender | | | Grade | | | |
|---|---|---|---|---|---|---|---|
| | Male | Female | | 6 | 7 | 8 | |
| | M(SD) | M(SD) | F(*df*) | M(SD) | M(SD) | M(SD) | F(*df*) |
| GPA | 2.49(.62) | 2.76 (.63) | 31.93** (653) | 2.60(.67) | 2.63 (.66) | 2.66 (.54) | .44 (652) |
| Self-regulation efficacy | 18.04 (5.09) | 18.24 (5.27) | .23 (663) | 18.78 (.5.04) | 17.71 (5.21) | 17.53 (5.28) | 4.07*(662) |
| Interference | 11.76 (5.51) | 11.30 (5.61) | 1.12 (663) | 11.74 (5.75) | 10.94 (4.97) | 12.01 (6.0) | 2.05 (662) |
| Facilitation | 5.22 (2.37) | 5.45 (2.56) | 1.43 (663) | 5.34 (2.52) | 5.31(2.40) | 5.37(2.50) | 0.03 |

*Note: *p<.05, **p<.001.*


*Table 10*

*One-way Analysis of Variance of GPA, Self-regulation Efficacy, and Inter-goal relations by Race*

| | Race | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Caucasian | African-American | Hispanic | Black non-Hispanic | Asian | Indian | Other | |
| | M(SD) | M(SD) | M(SD) | M(SD) | M(SD) | M(SD) | M(SD) | F(*df*) |
| GPA | 2.68 (.71) | 2.57 (.54) | 2.72 (.82) | 2.40 (.77) | 3.13 (.40) | 2.84 (.49) | 2.61 (.63) | 2.46*(648) |
| Self-regulation efficacy | 17.24 (5.03) | 18.70 (4.99) | 17.95 (5.79) | 18.07 (5.28) | 17.73 (5.05) | 18.71 (3.59) | 17.38 (5.44) | 1.62 (658) |
| Interference | 11.29(5.42) | 12.01 (5.73) | 10.62 (5.44) | 12.84 (5.99) | 8.48 (1.86) | 13.02 (4.95) | 10.88 (5.26) | 1.79 (658) |
| Facilitation | 5.20 (2.62) | 5.16 (2.54) | 5.49 (2.41) | 5.25 (2.53) | 4.67 (2.64) | 5.30 (2.28) | 5.21 (2.10) | .56 (658) |

*Note: *p<.05.*

Table 11

*One-way Analysis of Variance of GPA and Self-regulation Efficacy and Inter-goal relations by Student Reported Mother Education Level*

| | Mother | | | | | |
|---|---|---|---|---|---|---|
| | Did not graduate high school | High school | Some College | College Degree | I don't know | |
| | M(SD) | M(SD) | M(SD) | M(SD) | M(SD) | F(*df*) |
| GPA | 2.71 (.66) | 2.59 (.62) | 2.72 (.58) | 2.64 (.63) | 2.56 (.67) | 1.56 (650) |
| Self-regulation efficacy | 16.96 (5.22) | 18.62 (4.92) | 18.13 (5.34) | 19.30 (4.88) | 17.56 (5.31) | 3.70* (660) |
| Interference | 10.98 (4.93) | 11.54 (5.34) | 11.56 (5.78) | 12.22 (6.11) | 11.31 (5.54) | .77 (660) |
| Facilitation | 5.01 (2.49) | 5.30 (2.40) | 5.59 (2.49) | 5.60 (2.46) | 5.21 (2.51) | 1.13 (660) |

*Note: *$p<.001$.

Table 12

*One-way Analysis of Variance of GPA and Self-regulation Efficacy and Inter-goal relations by Student Reported Father Education Level*

| | Father | | | | | |
|---|---|---|---|---|---|---|
| | Did not graduate high school | High school | Some College | College Degree | I don't know | |
| | M(SD) | M(SD) | M(SD) | M(SD) | M(SD) | F(*df*) |
| GPA | 2.67 (.63) | 2.63 (.59) | 2.68 (.63) | 2.60 (.78) | 2.61 (.64) | .24 (650) |
| Self-regulation efficacy | 18.15 (5.29) | 18.38 (4.87) | 18.97 (5.14) | 18.89 (5.31) | 17.66 (5.24) | 1.64 (660) |
| Interference | 11.52 (5.33) | 11.57 (5.49) | 11.56 (5.64) | 11.43 (6.25) | 11.53 (5.46) | .01 (660) |
| Facilitation | 4.92 (2.55) | 5.38 (2.37) | 5.27 (2.50) | 5.48 (2.54) | 5.36 (2.48) | .50 (660) |

**Exploratory Factor Analysis**

In general, exploratory factor analysis aids in identifying distinct dimensions that represent theoretical constructs when there are no firm a priori expectations regarding the relationship between measured variables and the underling latent variables they represent. This approach stands in contrast to a confirmatory factor analysis (CFA) procedure used to assess the construct validity of an established measure (Floyd & Widaman, 1995).

Although the current goal measure contains goals based on themes and categorizations derived from previous work (Ford, 1992), it is a newly constructed goal assessment and not an exact replication of the original taxonomy. Further, other researchers have found evidence that goals within the original 24 categorizations suggested by Ford factor into different structures wherein goals merge across categories (e.g., Boekaerts et al., 2012). In light of these considerations, the researcher determined that an exploratory factor analysis would be most appropriate in deriving the appropriate goal factor scores for the analyses.

Generally, the first component or factor will produce the highest possible squared correlations between variables, maximizing the amount of variance explained by this factor. Subsequent factors will account for less variance, and researchers should retain only those factors that contribute meaningful amounts of variance to the factor structure. Determining what constitutes a meaningful amount of variance is a somewhat relative process, and researchers should retain the final factors based on a combination of the results of statistical tests (i.e., maximum likelihood estimation),

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psychometric criteria (i.e., eigenvalues above 1.0), and "rules of thumb" (e.g., scree plots; Floyd & Widaman, 1995).

For the present study, the researcher ran an exploratory factor analysis on all 18 goals across the six goal categorizations to establish multiple goal factor scores. Several criteria established the factorability of the 18 goals. Many goals were correlated at the .30 level or higher, suggesting reasonable factorability (see Tables B1 and B2 in Appendix B; Floyd & Widaman, 1995). In addition, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was above the recommended value of .80, and the Bartlett's Test of sphericity was significant for all factor analyses.

One important criterion used in this study was the continued elimination of items or goals with factor loadings that were below the widely accepted level of .40 (Floyd & Widaman, 1995; Neill, 1994). According to Floyd and Widaman, if items do not have substantially high loadings on any factor, based on a given cut-off point, they "may be deleted from the analysis and the factor analysis may be recomputed on the remaining subset of items" (p.295). In this study, the researcher conducted four factor extractions to achieve an interpretable factor structure containing loadings above .40, and without cross-loadings exceeding .30, in the final factor structure. The researcher conducted all factor analyses using a maximum likelihood extraction method with an oblimin rotation.

For the initial factor analysis, eigenvalues over 1.0 indicated that the first four factors explained 26%, 12%, 7%, and 6% of the variance, respectively. The researcher removed the goals "Be challenged" and "Have good relationships with my friends" because they had loadings below .30 (see Table B5 in Appendix B). The

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second factor analysis also produced four factors explaining 26%, 14%, 8%, and 6% of the variance, respectively. This analysis produced two more goals that had factor loadings of .30 or below ("Have fun" and "Feel relaxed with no stress"). The researcher removed these factors and conducted a third factor analysis (see Table B6 in Appendix B). The third factor analysis produced a three-factor structure explaining 28%, 14%, and 9% of the variance, respectively. Only one goal remained at or below the .30 level—"Make my own decisions and choices." The researcher removed this goal and ran a final factor analysis (see Table B7 in Appendix B). The fourth factor analysis also produced a three-factor solution that explained 30%, 15%, and 9% of the variance. In this iteration, no factor loadings fell below .42, and there were no cross-loadings above .17. Most factor loadings in the final structure were above .50 (higher than in prior solutions; see Table 13).

In sum, the researcher eliminated five goal items because they did not meet the minimum criteria of having a primary factor loading of above .40 and cross-loadings that did not exceed .30. The total variance explained by the final three factors (54%) was either higher or equivalent to that produced by the larger four-factor structure, making the final three-factor structure a more interpretable and valid solution In addition, there was a clear "leveling off" of eigenvalues after three factors (see Figure 7; Floyd & Widaman, 1995; Neill, 1994).
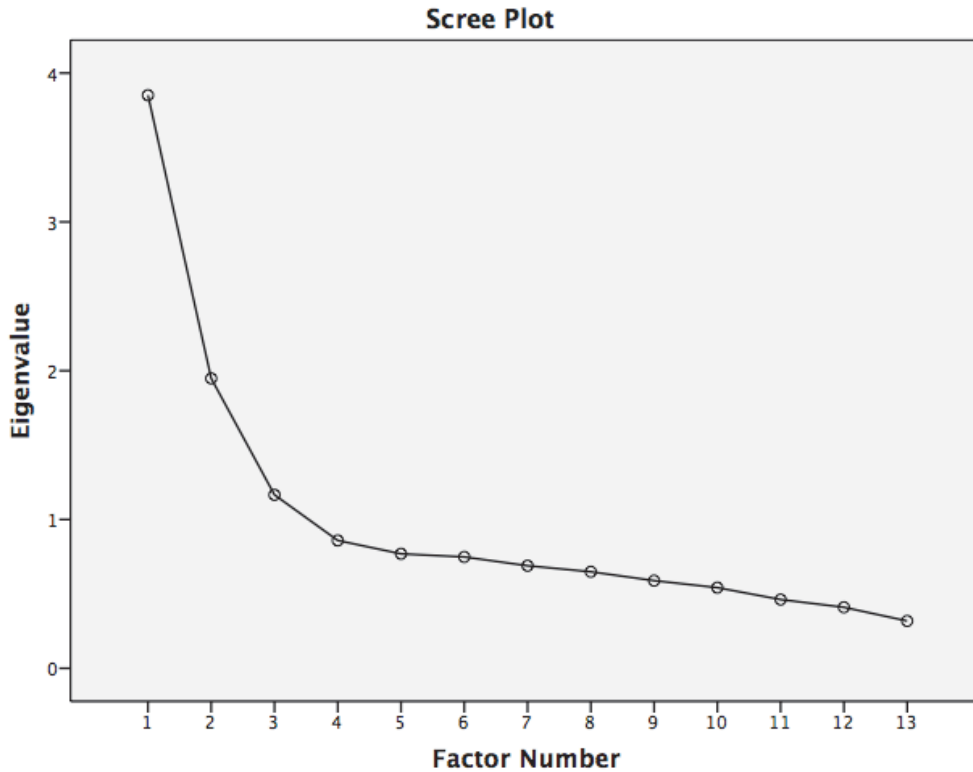
Figure 7. Scree plot for Final 3 Factor Structure.

The researcher ran the final three-factor analysis using both varimax and oblimin rotations, and there was little difference in the solutions once the researcher removed the five goals with loadings that were not above .40. The KMO measure of sampling adequacy was also above the recommended value of .80 (KMO = .84), and the Bartlett's Test of sphericity was significant ( $x^2$ (78) = 2169.58, $p$ <.001) in the final three-factor structure. Ultimately, the researcher selected the oblimin rotation because it provided the best-defined factor structure, and the goals were highly correlated in the population (see Table 13).

Table 13
*Final Factor Analysis Pattern Matrix Loadings*

|  | F1 | F2 | F3 |
|---|---|---|---|
| Pay attention | **0.73** | | |
| Learn new things | **0.42** | 0.16 | -0.12 |
| Follow rules | **0.77** | -0.15 | |
| Get good grades | **0.44** | 0.17 | |
| Listen to my teacher | **0.80** | -0.15 | -0.10 |
| Make friends | | **0.53** | -0.14 |
| Feel happy | | **0.43** | -0.12 |
| Be part of a popular group | -0.16 | **0.50** | |
| Feel unique and special | | **0.54** | |
| Feel confident about myself | 0.17 | **0.58** | |
| Give help to my classmates | | | **-0.76** |
| Share with my classmates | | | **-0.52** |
| Cheer up a classmate who is sad | | | **-0.60** |

*Note:* $N$ = 665; Maximum Likelihood extraction with an Oblimin rotation (5 iterations); KMO = .84, $x^2$ (78) = 2169.58, $p$ <.001. The goals of "Be challenged", "Feel relaxed with no stress", "Have fun", "Have good relationships with friends" and "Make my own decisions and choices" were excluded.

The final factor structure represents three distinct multiple goal factors. The first factor score (F1) was the Academic and Social Responsibility goals factor and included the following goals: "Pay attention," "Listen to teacher," "Follow rules," "Learn new Things" and "Get good grades." The second factor score (F2) was the Affective, Autonomy, and Interpersonal goals factor and included the following goals: "Feel happy," "Make new friends," "Be part of a popular group," "Feel confident about myself" and "Feel unique and special." Finally, the third factor score (F3) was the prosocial goals factor and included the following goals: "Cheer up a classmate who is sad," "Help a classmate," and "Share with a classmate." This multiple goal factor score was the only case in which all goal item loadings representing a given factor belonged to the respective goal categorization theme as suggested by Ford's (1992) taxonomy. In other words, the Prosocial factor (F3) was

composed exclusively of goal items classified as prosocial goals in Ford's taxonomy. The other factor scores represented combinations of goals across categorizations.

The researcher saved these final three-factor scores as regression scores for use in subsequent analyses. This decision maximized the validity of the factor scores and helped the researcher obtain a more unbiased estimate of true factor scores than those obtained by using alternative sums of scores methods (DiStefano, Zhu, & Mindrila, 2009). Regression scores in particular are better suited to maximizing the validity of factor scores than are other methods. One can obtain these scores using a least-squares regression model and "[taking] into account not only the correlation between the factors and between factors and observed variables (via item loadings), but also the correlation among oblique factors" (DiStefano, Zhu, & Mindrila, 2009 p. 4). The researcher used an oblimin rotation in this case, which produced an "optimal" factor score.

There was a significant positive correlation between all factor scores (see Table 14). Of notable importance, Factor 1 (i.e., Academic and Social Responsibility goals), Factor 2 (i.e., Affective, Autonomy, and Interpersonal goals) correlated significantly and positively with GPA, self-regulation efficacy, and goal facilitation (see Table 15). The unexpected negative loadings for all items on Factor 3 (i.e., prosocial goals) indicated an inverted structure. As such, the researcher viewed all negative relations as positive and all positive relations as negative. An inverted structure signified that a negative loading on the item "Share with my classmates," for example, actually indicated a *lack* of "Sharing with classmates," and thus represented a stronger presence of the "positive" Prosocial latent factor (F3). The researcher

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reported all findings accordingly, and the reader should interpret them as they appear

in the text, tables, and figures.

Table 14
*Factor Correlation Matrix for Final 3 Factor Solution*

|  | Academic and Social Responsibility (F1) | Affective Autonomy and Interpersonal (F2) |
|---|---|---|
| Affective Autonomy and Interpersonal(F2) | 0.20 | |
| Prosocial (F3) | 0.48 | 0.40 |

Table 15
*Correlations for GPA, Self-regulation Efficacy, Interference, Facilitation, and Factor Scores*

|  | GPA | Self-regulation efficacy | Interference | Facilitation |
|---|---|---|---|---|
| Self-regulation efficacy | .11** | | | |
| Interference | -.19** | .06 | | |
| Facilitation | .17** | .29** | -.10* | |
| Academic and Social Responsibility (F1) | .24** | .56** | -.04 | .24** |
| Affective Autonomy and Interpersonal(F2) | .10* | .32** | .02 | .15** |
| Prosocial (F3) | .15** | .43** | .00 | -.13** |

*Note: N= 655; *, $p < 0.05$.** $p < 0.01$.*

As demonstrated in Table 15, the prosocial goal factor (F3) correlated

significantly and positively with GPA and self-regulation efficacy, and correlated

negatively with facilitation. There were no significant correlations between factor

scores and perceptions of inter-goal interference. Finally, a significant negative

correlation was evident between interference and facilitation scores (see Table 15).

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**Core Research Question Analyses**

Conditional process analyses are useful when the goal of research questions is to (a) describe the conditional nature of the mechanisms by which one or more variables transmits its effect on another and (b) test contingent hypotheses about these effects (Hayes, 2013). The conditional effects of self-regulation efficacy, multiple goals, and inter-goal relations on academic performance were of great interest to the researcher during the present study. The researcher sought to (a) examine the direct and indirect pathways through which self-regulation efficacy transmitted its effect on GPA and (b) explore the moderating effects of inter-goal relations on this process. Conditional process analyses focus on these combined effects and estimate the conditional nature of both the direct and indirect effects of self-regulation efficacy on academic performance, which allows for the interpretation of more complex effects (Hayes, 2013).

Hayes (2013) developed an SPPS macro called PROCESS, which has built-in modeling capabilities that combine the aforementioned mediation and moderation analyses. The PROCESS software provides regression coefficients for the regression paths, as well as estimations of both conditional and unconditional (i.e., not including the moderators) indirect and direct effects for conceptual models with more than one mediator or moderator. In addition, the application produces output that allows the researcher to draw specific inferences (e.g., standard errors, p-values, confidence intervals for direct effects, bootstrap confidence intervals for conditional indirect effects; Hayes, 2013).

Most importantly, the PROCESS software has the unique capability of producing information that a regular OLS regression in SPSS does not. For example, the software generates bootstrap confidence intervals for conditional indirect effects at values of the moderator corresponding to the $10^{th}$, $25^{th}$, $50^{th}$, $75^{th}$, and $90^{th}$ percentiles, based on up to 50,000 bias-corrected bootstrap samples. It also allows for a formal test of moderated mediation and a comparison of conditional indirect effects. Finally, the application has the capacity to provide a visual representation of the conditional indirect and direct effects of self-regulation efficacy ($X$) on GPA ($Y$) via multiple goals ($M$) as a function of inter-goal relations ($W$ and $Z$; see Figure 2; Hayes, 2013).

A series of multiple linear regressions was used to address the first two research questions in this study; a simple mediation model, and a separate moderated mediation model, were tested to answer the third, fourth, and fifth research questions. All analyses were conducted using IBM SPSS 22 and PROCESS software (Hayes, 2013). Table 16 displays the findings from the initial multiple regression analysis, Table 20 details the results of the simple mediation model, and Tables 24 and 25 contain coefficients for the moderated mediation model. The analyses controlled for gender, race, and grade in all models. All predictor variables were transformed into z-scores to reduce the impact of multicollinearity and standardize the units of measurement (Hayes, 2013).

Finally, given that the PROCESS macro only provided unstandardized coefficients, main (first-order) effects standardized coefficients were calculated by multiplying the unstandardized coefficients for each predictor variable $j$ from the

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model by the standard deviation of $j$. Interaction coefficients were calculated according to Marsh and colleagues (2013) using the following equation:

$$Z_y = Y_0 + Y_1 Z_{x_1} + Y_2 Z_{x_2} + Y_3 Z_{x_1} Z_{x_2} + e$$

Given that all variables are standardized, the product of the standardized value of, for example, perceptions of inter-goal interference and self-regulation efficacy (i.e. the interaction term) could be assumed to be zero, even if the value differs from zero. The only case in which the mean product of the interaction term would be zero is if the variables are completely uncorrelated, which is not true of the variables in the current study. Therefore, Marsh and colleagues (2013) suggest calculating the interaction term represented by the product of $Z_{x1}$ and $Z_{x2}$ as:

$$\frac{\sqrt{\Phi_{11}} \Phi_{12}}{\sqrt{\Phi_{33}}}$$

where $f_{11} = var(x_1)$, $f_{22} = var(x_2)$, $f_{33} = var(x_1 x_2)$ are from the unstandardized solution. The following sections present a detailed explanation of the results as they correspond to each of the research questions.

**Research question 1. To what extent do multiple goals, self-regulatory efficacy, and perceptions of inter-goal interference predict academic performance?** The first research question addresses whether multiple goals, self-regulatory efficacy, and inter-goal interference help to predict GPA. The researcher answered this question by running a two-step linear regression. Table 16 presents the regression coefficients for self-regulation efficacy and inter-goal relations as predictors of academic performance at step one, with student multiple goal factor

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scores added at the second step. The amount of variance explained increases from the first to the second steps, indicating that student goals are important predictors of GPA, above and beyond the variables of self-regulation efficacy and inter-goal interference or facilitation. In addition, self-regulation efficacy changed from a significant positive predictor to a significant negative predictor of GPA when the researcher included multiple goal factor scores in the model.

Table 16
*Regression Coefficients for Model Predicting GPA*

| | Step 1 | | | Step 2 | | |
|---|---|---|---|---|---|---|
| | B | SE | $\beta$ | B | SE | $\beta$ |
| (Constant) | -.80 | .16 | | -.74 | .16 | |
| Self-regulation efficacy | .08 | .04 | .08* | -.05 | .05 | -.05 |
| Interference | -.18 | .04 | -.18*** | -.16 | .04 | -.16*** |
| Facilitation | .13 | .04 | .13*** | .10 | .04 | .10** |
| Gender | .41 | .07 | .20*** | .42 | .07 | .21*** |
| Grade | .06 | .05 | .05 | .03 | .03 | .04 |
| Race | .04 | .04 | .04 | .03 | .05 | .02 |
| Academic and Social Responsibility (F1) | | | | .27 | .06 | .25*** |
| Affective Autonomy Interpersonal (F2) | | | | .08 | .05 | .07 |
| Prosocial (F3) | | | | .06 | .06 | .05 |
| $R^2$ | | .11*** | | | .15*** | |
| $F$ for change in $R^2$ | | 13.54*** | | | 12.59*** | |

*Note: N = 655, *p<.05, **p<.01, p <.001;  df = (9,645).*

When testing the influence of inter-goal relations, interference scores proved significant negative predictors of GPA, while facilitation scores were significant positive predictors of GPA at both steps. In addition, Factor 1 (i.e., Academic and Social Responsibility goals) was a significant positive predictor of GPA at step two. The researcher entered gender, grade, and race as covariates, and gender remained a significant positive predictor of GPA, even after accounting for students' multiple goals at step two. This finding indicates that females averaged higher GPAs than did males.

The data provided evidence that higher scores on the factor representing academic and social responsibility goals and inter-goal facilitation related to higher academic performance. Higher inter-goal interference scores, on the other hand, related to lower levels of academic performance. The shift in direction of the relationship between self-regulation efficacy and academic performance in the first and second models might result from either the mediating effects of multiple goals or the moderating effects of inter-goal relations. The researcher explored this phenomenon when addressing subsequent research questions.

**Research question 2. Does self-regulatory efficacy predict academic, social responsibility, and prosocial goals more than other goal combinations?** This research question focused on the relationship between self-regulation efficacy and multiple goal factor scores. It was necessary to establish a significant predictive relationship between self-regulation efficacy and each goal factor score to proceed with the mediation and moderated mediation analyses. If self-regulation efficacy did not predict goal factor scores, then one of the basic assumptions necessary to carry

out a mediation analysis would not be met. In other words, self-regulation efficacy

(*X*) had to predict GPA *(Y)* and multiple goals *(M)*. Multiple goals *(M)* also had to

predict GPA (*Y*) to test a mediation model wherein multiple goals (*M*) explained the

relationship between self-regulation efficacy (*X*) and GPA (*Y*; see Figure 3).

Results displayed in Table 17 confirm that self-regulation efficacy

significantly and positively predicts each multiple goal factor score. In addition, inter-

goal interference was a significant negative predictor, and inter-goal facilitation was a

significant positive predictor, of the Academic and Social Responsibility (i.e., Factor

Score 1, F1). Grade level was also a significant and positive predictor of each of the

goal factor scores, indicating that older students had higher goal factor scores. In

addition, self-regulation efficacy explained the most variance in the model predicting

Factor 1, which accounted for 31% of the variance in a factor representing multiple

academic and social responsibility goals. These results support the contention that

efficacy beliefs influence the type of self-regulatory standards a student will set and

adopt and affects their decision to exert effort in pursuit of their goals (Bandura et al.,

2003).

Table 17
*Regressions Coefficients for Self-regulation Efficacy Predicting Multiple Goal Factor Scores.*

|  | Factor 1 (F1) | | | Factor 2 (F2) | | | Factor 3 (F3) | | |
|---|---|---|---|---|---|---|---|---|---|
|  | B | SE | $\beta$ | B | SE | $\beta$ | B | SE | $\beta$ |
| (Constant) | .00 | .03 |  | .00 | .03 |  | .00 | .03 |  |
| Self-regulation efficacy | .51 | .03 | .56* | .27 | .03 | 32* | .38 | .03 | .43* |
| $R^2$ |  | .31* |  |  | .10* |  |  | .19* |  |
| F for change $R^2$ |  | 299.17** |  |  | 76.21* |  |  | 154.24* |  |

*Note: N* = 665, *$p$<.001.  F1= Academic and Social Responsibility goals, F2 = Affective, Autonomy and, Interpersonal goals, and F3= Prosocial goals.

**Research question 3. To what extent do multiple goals explain the relationship between self-regulatory efficacy and academic performance? In other words, do multiple goals mediate, or partially mediate, the relation between self-regulatory efficacy and academic performance?** After establishing that self-regulation efficacy (*X*) predicted both multiple goals (*M*) and GPA *(Y)*, it was necessary to establish that multiple goals mediated the relationship between self-regulation efficacy and GPA. This research question addressed whether the effects of self-regulation efficacy were totally or partially mediated by three multiple goal factor scores in parallel. In a parallel multiple mediator model, *X* (self-regulation efficacy) exerts its effect on *Y* (GPA) through k+1 pathways. The first pathway flows directly from *X* (self-regulation efficacy) to *Y* (GPA) without passing through any of the mediators (*M,* multiple goals), and the other *k* pathways are indirect, each passing through a single mediator (Hayes, 2013).

Unlike a simple mediation model, where indirect effects are simply the product of paths linking *X* (self-regulation efficacy) to *Y* (GPA)*,* parallel mediator models designate *specific indirect effects* as the product of the pathway effect of *X* (self-regulation efficacy) on *M* (multiple goals), and the pathway of *M* (multiple goals) to *Y* (GPA)*.* One must control for all other mediators in the model when interpreting these specific indirect effects. In other words, the specific indirect effect of *X* (self-regulation efficacy) on Y (GPA) through *M* (multiple goals) is the estimated amount by which two cases that differ by one unit on *X* (self-regulation efficacy) differ on *Y* (GPA). This takes into account the effect of *X* (self-regulation efficacy) on *M* (multiple goals), which in turn, affects *Y* (GPA), while holding all 3

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multiple goal factor score mediators constant. The sum of these *specific indirect effects* yields the total indirect effect of $X$ (self-regulation efficacy) on $Y$ (GPA) through all mediators in the model (which is also the difference between the total and direct effects of $X$ self-regulation efficacy on $Y$ GPA; Hayes, 2013).

The linear equations estimated to quantify the direct and indirect effects of self-regulation efficacy on academic performance were:

$$M_1 = i_1 + a_1 X + f_1 C_1 + f_2 C_2 + f_3 C_3 + e_{M_1}$$
$$M_2 = i_2 + a_2 X + f_1 C_1 + f_2 C_2 + f_3 C_3 + e_{M2}$$
$$M_3 = i_3 + a_3 X + f_1 C_1 + f_2 C_2 + f_3 C_3 + e_{M3}$$

and

$$Y = i_2 + c' X + b_1 M_1 + b_2 M_2 + b_3 M_3 + g_1 C_1 + g_2 C_2 + g_3 C_3 + e_Y,$$

where $X$ = self-regulation efficacy, $M$ = multiple goal factor scores, $Y$ = GPA, and $C$'s represent the three covariates of gender (C1), grade (C2), and race (C3).

The researcher added the variables gender, grade, and race to the model to account for any confounding effects they may have on the model. Adding $C$ (covariates or control variables) to models $M$ (multiple goals) and $Y$ (GPA) removed the confounding threat these variables might have had on claims about causal associations between $X$ (self-regulation efficacy) and $M$ (multiple goals), $X$ (self-regulation efficacy) and $Y$ (GPA), and $M$ (multiple goals) and $Y$ (GPA). In other words, the researcher statistically controlled for the covariates in the estimation of other effects in the model. The interpretation of direct and indirect effects remained the same; however, path $c'$—i.e., the direct effect of $X$ (self-regulation efficacy) on $Y$ (GPA)—helped the researcher to quantify the degree to which two cases that differed by one unit on $X$ might differ on $Y$ when holding $M$ (multiple goals: F1, F2, F3) and $C$

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(covariates: gender, grade, race) constant (Hayes, 2013).

Results for the OLS regression of simple mediation, as described above, are consistent with the claim that self-regulation efficacy is related positively to academic performance indirectly through its effect on multiple goals (see Tables 18 and 19). First, the model that explained the multiple goal factor scores as mediators explained almost twice the amount of variance in GPA ($R^2 = .11$) than did a model that excluded these factors as predictors ($R^2 = .06$). The researcher also determined that self-regulation efficacy was a significant and positive predictor of all the three multiple goal factor scores.

Table. 18
*Regression Coefficients for Self-regulation Efficacy Predicting GPA*

|          | B    | SE   | $\beta$ |
|----------|------|------|---------|
| Constant | -.84 | .17  |         |
| Self.reg | .11  | .04  | .11*    |
| Gender   | .43  | .08  | .22*    |
| Grade    | .07  | .05  | .05     |
| Race     | .04  | .04  | .04     |
|          |      | .06* |         |

Note: *N* =655. *Note: N* = 655, *p<.001.

Table 19

*Indirect Effects: Coefficients for the Effect of Self-regulation Efficacy on GPA Indirectly by way of Multiple Goals.*

| | Factor 1 (F1) | | | Factor 2 (F2) | | | Factor 3 (F3) | | | GPA | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | SE | B | B | SE | B | B | SE | B | B | SE | B |
| Constant | -.22 | .13 | | -.30 | .13 | | -.45 | .13 | | -.77 | .16 | |
| X (Self-regulation efficacy) | .52 | .03 | .56* | .28 | .03 | .32* | .38 | .03 | .44* | -.05 | .05 | -.05 |
| M (Academic and Social Responsibility, F1) | - | - | | - | - | | - | - | | .31 | .06 | .31** |
| M (Affective Autonomy and Interpersonal, F2) | - | - | | - | - | | - | - | | .10 | .05 | .09 |
| M (Prosocial, F3) | - | - | | - | - | | - | - | | .07 | .06 | .06 |
| C1 (Gender) | .02 | .06 | .01 | -.07 | .06 | -.04 | .15 | .06 | .09 | .44 | .08 | .22* |
| C2 (Grade) | .10 | .04 | .08* | .16 | .04 | .15* | .11 | .04 | .10* | .03 | .05 | .02 |
| C3 (Race) | .00 | .03 | 0.0 | .06 | .03 | .07 | .01 | .03 | .01 | .03 | .04 | .03 |
| | | = .31* | | | =.13* | | | =.20* | | | =.11* | |
| | $F_{(4, 650)}=73.81*$ | | | $F_{(4, 650)}=23.91*$ | | | $F_{(4, 650)}=35.17*$ | | | $F_{(7,647)}=12.03*$ | | |

Note: $N = 655$, *, $p<.001$. M = mediator, C = control variable or covariate.

The specific indirect effect of self-regulation efficacy on GPA through Factor 1 goals was significant and estimated as $a_1b_1 = .16$ (Bootstrap confidence interval of lower .10 to upper .23), where $a$ represents the effects of self-regulation efficacy ($X$) on multiple goal factor score ($M$) and $b$ represents the effects of multiple goal factor scores $(M)$ on GPA $(Y)$. Therefore, the researcher estimated that two cases that differed by one unit on $X$ (self-regulation efficacy) differed by 0.16 units in GPA through Factor 1 multiple goal scores, and that students with higher self-regulation scores also had higher GPAs. The specific indirect effects for Factor 2 and Factor 3 multiple goal factor scores were non-significant. Table 20 summarizes all indirect effects and 95% bootstrap confidence intervals for the simple mediation model. In addition, pairwise comparisons of the indirect effects revealed that the indirect effect for the Factor 1 multiple goal score was statistically different from both the Factor 2 and Factor 3 multiple goal factor scores, although these scores did not differ from each other.

Table 20

*Comparison of Indirect effects of Self-regulation Efficacy on GPA via Multiple Goals*

| Effect ($a_ib_i$) | | | | |
|---|---|---|---|---|
| | Point estimate | SE | BootLLCI | BootULCI |
| TOTAL | .16 | .03 | .10 | .23 |
| Academic and social responsibility (F1) | .16 | .03 | .10 | .23 |
| Affective autonomy and interpersonal (F2) | .03 | .02 | .00 | .06 |
| Prosocial (F3) | .03 | .03 | .08 | .02 |
| (C1) | .13 | .03 | .07 | .20 |
| (C2) | .19 | .05 | .09 | .29 |
| (C3) | .06 | .03 | .00 | .13 |

*Note:* N=655. Specific indirect effect contrast definitions are as follows: (C1) = F1 - F2, (C2) = F1 – F3, and (C3) = F2 - F3. LLCI = bootstrap lower confidence interval, ULCI = bootstrap upper confidence interval.

The direct effect of self-regulation efficacy on GPA was not statistically significant at the .05 alpha level. However, the total effects model, quantified as the sum of all specific indirect effects and the direct effect, was significant at the $p<.01$ level (see Table 21). This finding confirms the presence of mediation, and suggests that student GPA does not differ as a function of self-regulation efficacy when one controls and accounts for multiple goal factor scores and covariates. The researcher used a SOBEL test to assess the mediation model formally. See Table 22 for the results of this test.

Table 21
*Total and Direct Effect of Self-regulation Efficacy on GPA via Multiple Goals*

|  | Effect | SE | *T* | *P* | LLCI | ULCI |
|---|---|---|---|---|---|---|
| Total effect | .11 | .04 | 2.80 | .01 | .03 | .18 |
| Direct effect | -.05 | .05 | -.98 | .33 | -.15 | .05 |

*Note: N* = 655. LLCI = lower confidence interval, ULCI =upper confidence interval.


Table 22
*Sobel Test for Indirect Effect of Self-regulation Efficacy via Multiple Goals*

|  | Effect | SE | *Z* | *P* |
|---|---|---|---|---|
| Academic and Social Responsibility (F1) | .16 | .03 | 4.97 | .00 |
| Affective Autonomy and Interpersonal (F2) | .03 | .02 | 1.71 | .09 |
| Prosocial (F3) | .03 | .02 | 1.13 | .26 |

Research question 4. To what extent do perceptions of inter-goal interference and facilitation moderate the relationships between self-regulatory efficacy and multiple goals, multiple goals and academic performance, and self-regulation efficacy and academic performance? Given that multiple goals mediated the relationship between self-regulation efficacy and GPA, the next step was to establish whether this relationship varied according to students' perceptions of inter-goal interference and facilitation. Research question 4 examined the conditional direct and indirect effects of self-regulation efficacy on GPA through multiple goals, while accounting for inter-goal relations. In this model, inter-goal interference and inter-goal facilitation serve as moderating variables. When researchers moderate an indirect effect of $X$ (self-regulation efficacy) on $Y$ (GPA) though $M$ (multiple goals), the framework is a moderated mediation model. Moderated mediation is essentially a mediation analysis that also accounts for the effects of moderating variables (Hayes, 2013).

Research question 5. Do the mediating effects of multiple goals differ for groups high or low in perceptions of inter-goal interference or facilitation? Research question 5 addresses whether the conditional indirect effect of self-regulation efficacy ($X$) on GPA ($Y$), when accounting for multiple goals ($M$), is significantly different for students at specific values of interference ($W$) and facilitation ($Z$). The moderated mediation model represents the mediation of the effect of self-regulation efficacy ($X$) on GPA ($Y$) via multiple goal factor scores ($M$), with both the direct and indirect effects of self-regulation efficacy moderated by interference ($W$) and facilitation ($Z$). As such, the direct and indirect effects are functions of the moderators $X$ and $Z$ (Hayes, 2013). Specifically, this model allows all three paths:

($X \longrightarrow M$, $X \longrightarrow Y$, and $M \longrightarrow Y$) to be moderated by *W* and *Z.*

Tables 25 and 26 present the results of the moderated mediation model. These analyses indicate that self-regulation efficacy is no longer a significant predictor of GPA when accounting for the effects of both multiple goals and inter-goal relations. Specifically, inter-goal interference remains a significant negative predictor, and inter-goal facilitation remains a significant positive predictor, of GPA. Factor 1 multiple goal scores also remain a significant positive predictor of GPA, while the other Factor scores were non-significant. These effects remained even when controlling for gender, race, and grade.

The significant negative interaction between self-regulation efficacy and inter-goal interference indicates that self-regulation efficacy influences GPA independent of multiple goals, but varies in relation to students' beliefs regarding the extent to which they perceive that their goals interfere with one another. The direct effect of self-regulation efficacy is *conditional* on this perception of inter-goal relations. Figure 8 provides a visual depiction of this interaction.
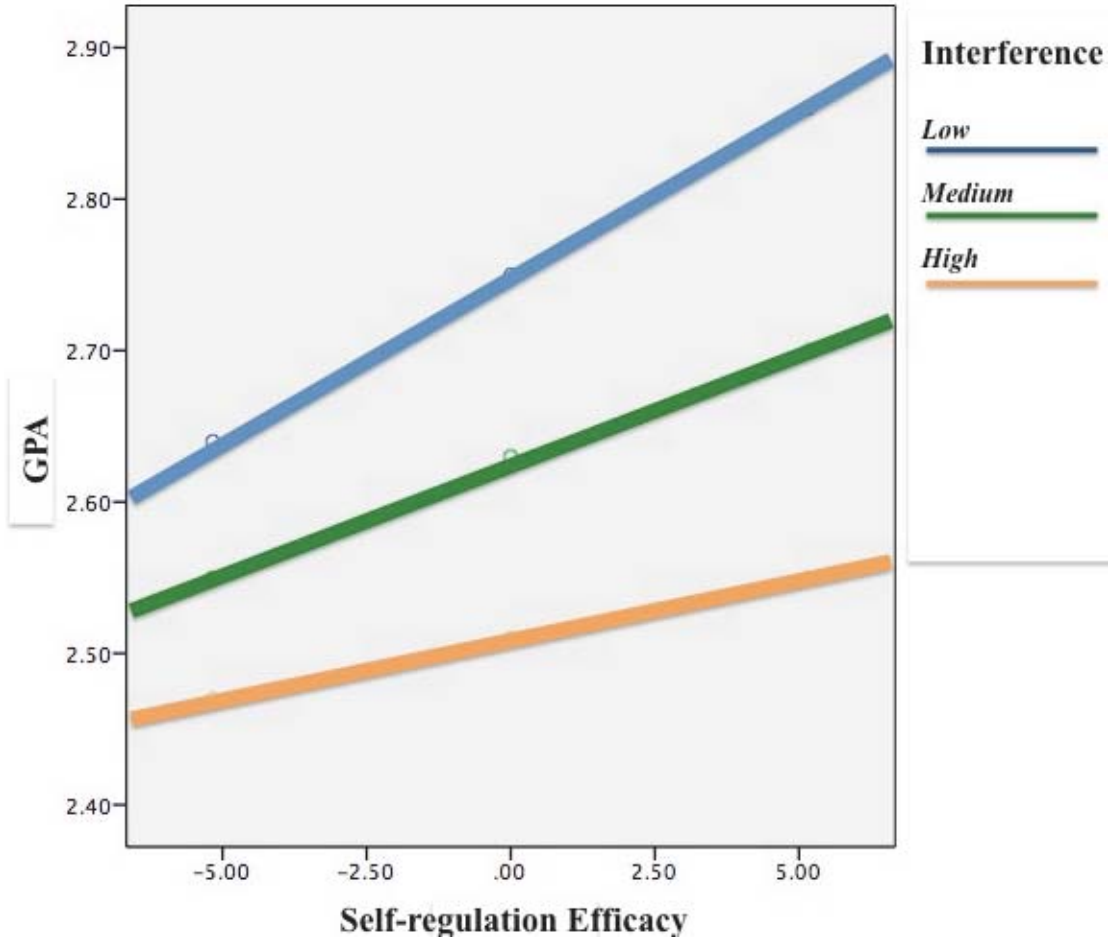
Figure 8. Plot of interaction between inter-goal interference and self-regulation regressed on GPA.

The researcher developed this graph depicted in Figure 8 using the PROCESS program (Hayes, 2013) and plotted it using a table that produced estimates of GPA (*Y*) at various combinations of self-regulation efficacy (*X*) and inter-goal interference (*W*). The program also produced the effect of self-regulation efficacy when accounting for inter-goal interference scores at the $10^{th}$ (low), $50^{th}$ (medium), and $90^{th}$ (high) percentiles of the sample distribution. These results indicated that there was no significant effect of self-regulation efficacy on GPA when students' interference scores were relatively high ($t = 1.01$, p<.31); however, there was a significant positive effect when students' interference scores were low ($t = 3.20$, p<.001). Further, students with the highest GPA had low self-

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regulation efficacy and interference scores, while students with high interference scores and low self-regulation efficacy scores had the lowest GPAs. It is important to note that this graph depicts the interaction without accounting for the effects of multiple goals (i.e., indirect effects). In other words, Figure 8 depicts the conditional effects of inter-goal interference on the relation between self-regulation efficacy and academic performance, but says nothing about the conditional indirect and direct effects of self-regulation efficacy on academic performance.

Table 23 details the conditional direct and indirect effects of self-regulation efficacy through multiple goals at values of perceived inter-goal facilitation and interference at the 10th, 25th, 50th, 75th and 90th percentiles of the distribution. These conditional analyses suggest that inter-goal interference moderates the direct effect of self-regulation efficacy on GPA *through multiple goals*, but only for students with very high perceptions of inter-goal interference. In this case, there was a significant decrease in GPA as both self-regulation efficacy and interference scores increased, as evidenced by the stronger negative direct effect when interference ($W$) = 1.46. This finding evidences the conditional indirect effect of self-regulation on GPA through multiple goals for students who also had high perceptions of inter-goal interference.

Table 23

*Model Coefficients for Conditional Direct and Indirect Effects of Self-regulation Efficacy via Goals.*

| | Indirect Effects | | | | | | | | | Direct Effects | | |
| | Interfere | Facilitate | Factor 1 | | Factor 2 | | Factor 3 | | | | | |
| Percentiles scores at values of moderator | W | Z | Effect | SE | Effect | SE | Effect | SE | 95% Confidence Interval | Effect | SE | *p* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Very Low (10th %) | -1.14 | -1.35 | 0.12 | 0.07 | 0.03 | 0.03 | -0.06 | 0.05 | -0.12 to 0.25 | 0.06 | 0.10 | 0.50 |
| Low (25th %) | -0.79 | -0.94 | 0.13 | 0.07 | 0.04 | 0.03 | -0.07 | 0.05 | -0.15 to 0.20 | 0.02 | 0.09 | 0.78 |
| Moderate (50th %) | -0.22 | -.013 | 0.15 | 0.06 | 0.05 | 0.03 | -0.07 | 0.05 | -0.19 to 0.12 | -0.04 | 0.08 | 0.62 |
| High (75th %) | 0.65 | 0.88 | 0.19 | 0.06 | 0.06 | 0.03 | -0.09 | 0.05 | -0.30 to -0.02 | -0.14 | 0.08 | 0.09 |
| Very High (90th %) | 1.46 | 1.49 | 0.22 | 0.06 | 0.07 | 0.04 | -0.10 | 0.07 | -0.42 to -0.03 | -0.23 | 0.10 | 0.02* |

*Note:* *p*<.05. W = Interference coefficients and Z = Facilitation coefficients at the 10th, 25th, 50th, 75th and 90th percentiles of the distribution.

Figures 9 and 10 provide a visual representation of the conditional indirect and direct effects of self-regulation efficacy on GPA. These findings include the conditional direct and indirect effects at different interference (*W*) or facilitation *(Z)* scores. The researcher produced the graphs using a dataset that contained the estimated direct and indirect effects for various values of the moderators (i.e., percentiles as described below; (Hayes, 2013). The graphs provide a visual representation of the effects on the *Y*-axis (GPA), values of the moderator on the *X*-axis (interference or facilitation), and the different lines for the indirect and direct effects (Hayes, 2013).

To produce the graphs, the researcher executed a compute command in PROCESS with values of multiple goal factor scores (*M*) at the $10^{th}$, $25^{th}$, $50^{th}$, $75^{th}$, and $90^{th}$ percentiles for inter-goal interference (see Figure 9) and facilitation (see Figure 10). The circles on the solid and dotted lines in Figures 9 and 10 indicate the values of each percentile of interference and facilitation scores for the direct and indirect conditional effects of self-regulation efficacy on GPA, respectively. The researcher created two compute commands for direct and indirect effects using the coefficients produced by the moderated mediation model (see Tables 24 and 25). Specifically, the researcher computed the direct effects as follows: $c'_1 + c'_4 * Interference$ and $c'_1 + c'_5 * Facilitation$, and calculated the indirect effects in the following manner:

$b_{1i} * (a_{1i} + a_{4i} * Intereference)$ and $b_{1i} * (a_{1i} + a_{5i} * Facilitation)$ for inter-goal interference and facilitation, respectively.

Table 24

*Coefficients for Conditional Effects: Moderating Effects of Inter-goal Relations with Self-regulation Efficacy predicting Multiple Goals*

| | M (Goals) (F1) Academic and Social Responsibility | | | M (Goals) (F2) Affective, Autonomy, and Interpersonal | | | M (Goals) (F3) Prosocial | | |
|---|---|---|---|---|---|---|---|---|---|
| | B | SE | $\beta$ | B | SE | $\beta$ | B | SE | $\beta$ |
| Constant | -.20 | .13 | | -.29 | .13 | | .45 | .13 | |
| Self.reg (X) | .50 | .03 | .54** | .27 | .03 | .32** | .39 | .03 | -.45** |
| Interference (W) | -.07 | .03 | -.08* | .00 | .03 | .00 | -.03 | .03 | .03 |
| SRxInter (XW) | .00 | .03 | .00 | .00 | .03 | .00 | .01 | .03 | .01 |
| Facilitate (Z) | .07 | .03 | .08* | .06 | .03 | .07 | .00 | .03 | .00 |
| SRxFacil (XZ) | .00 | .03 | .00 | -.02 | .03 | -.02 | -.01 | .03 | -.01 |
| Gender (cov1) | .01 | .06 | .01 | -.07 | .06 | -.01 | .15 | .06 | -.09* |
| Grade (cov2) | .10 | .04 | .08** | .16 | .04 | .15** | .11 | .04 | -.10** |
| Race (cov3) | .00 | .03 | .00 | .06 | .03 | .08* | .01 | .03 | -.15 |
| | | | .32** | | | .14** | | | .21** |

*Note:* N = 655; *p*<.01,**p*<.001. Pathways depicted in Figure 4 are found next to each variable name. Bootstrap =10,000.

Table 25

*Coefficients for Conditional Effects Model: Moderating Effects of Inter-goal Relations Self-regulation Efficacy predicting GPA via Multiple Goals*

| | Y (GPA) | | | |
|---|---|---|---|---|
| | B | SE | β | P |
| Constant | -.74 | .16 | | .00 |
| Self.reg (*X*) | -.06 | .05 | -.09 | .21 |
| Interference (*W*) | -.14 | .04 | -.22** | .00 |
| SRxInter (*XW*) | -.11 | .05 | -.17* | .01 |
| Facilitate (*Z*) | .11 | .04 | .17** | .00 |
| SRxFacil (*XZ*) | .00 | .06 | .00 | .93 |
| Factor 1 (*M1*) | .27 | .06 | .42** | .00 |
| Factor 2 (*M2*) | .07 | .05 | .11 | .17 |
| Factor 3 (*M3*) | .06 | .06 | -.09 | .35 |
| F1xInter (*M1W*) | .07 | .06 | .11 | .23 |
| F2xInter (*M2W*) | .04 | .05 | .06 | .61 |
| F3xInter (*M3W*) | .03 | .06 | -.05 | .83 |
| F1xFacil (*M1Z*) | -.04 | .06 | -.06 | .66 |
| F2xFacil (*M2Z*) | -.07 | .05 | -.11 | .29 |
| F3xfacil (*M3Z*) | .10 | .06 | -.16 | .06 |
| Gender (cov1) | .42 | .07 | .33** | .00 |
| Grade (cov2) | .03 | .05 | .04 | .50 |
| Race (cov3) | .03 | .03 | .05 | .31 |
| | | .16** | | |

*Note: N* = 655; **p*<.01, **p<.001. Pathways depicted in Figure 4 are found next to each variable name. Bootstrap = 10,000.

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Figure 9. A visual representation of the conditional indirect and direct effects of self-regulation efficacy as a function of perceptions of inter-goal interference.
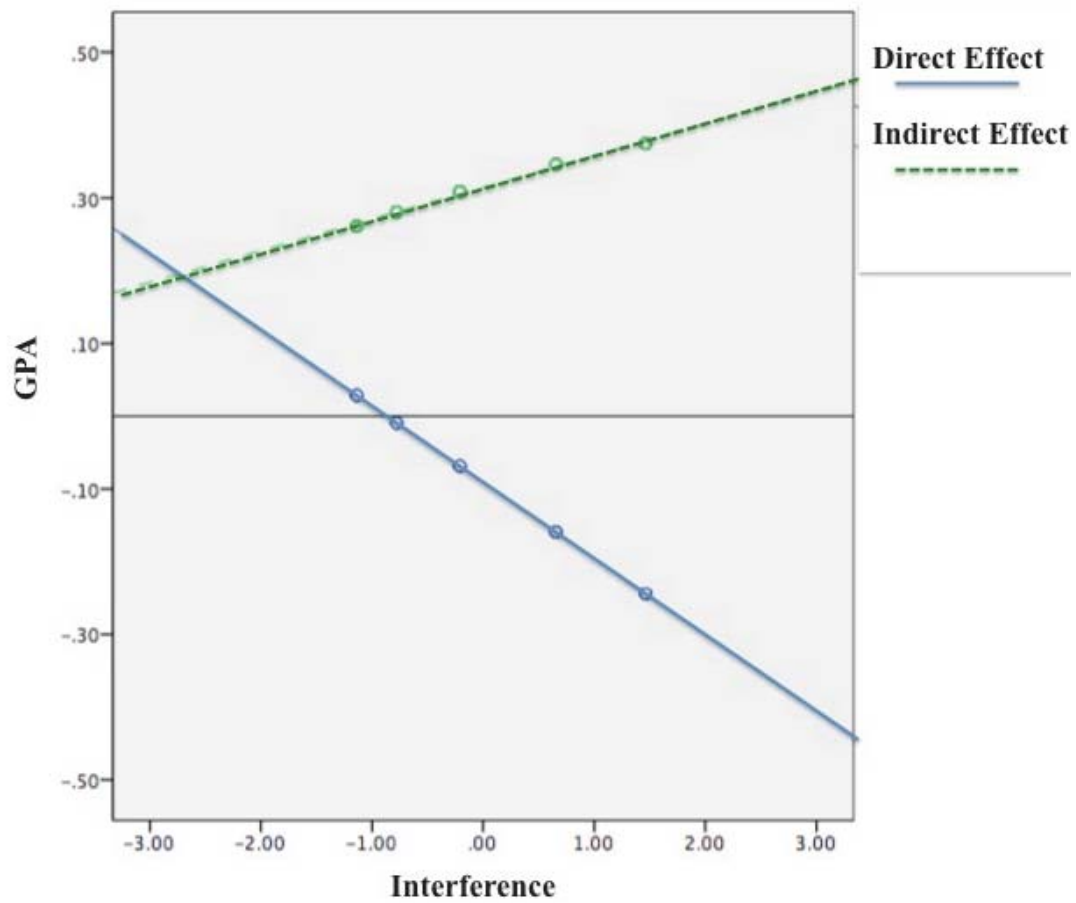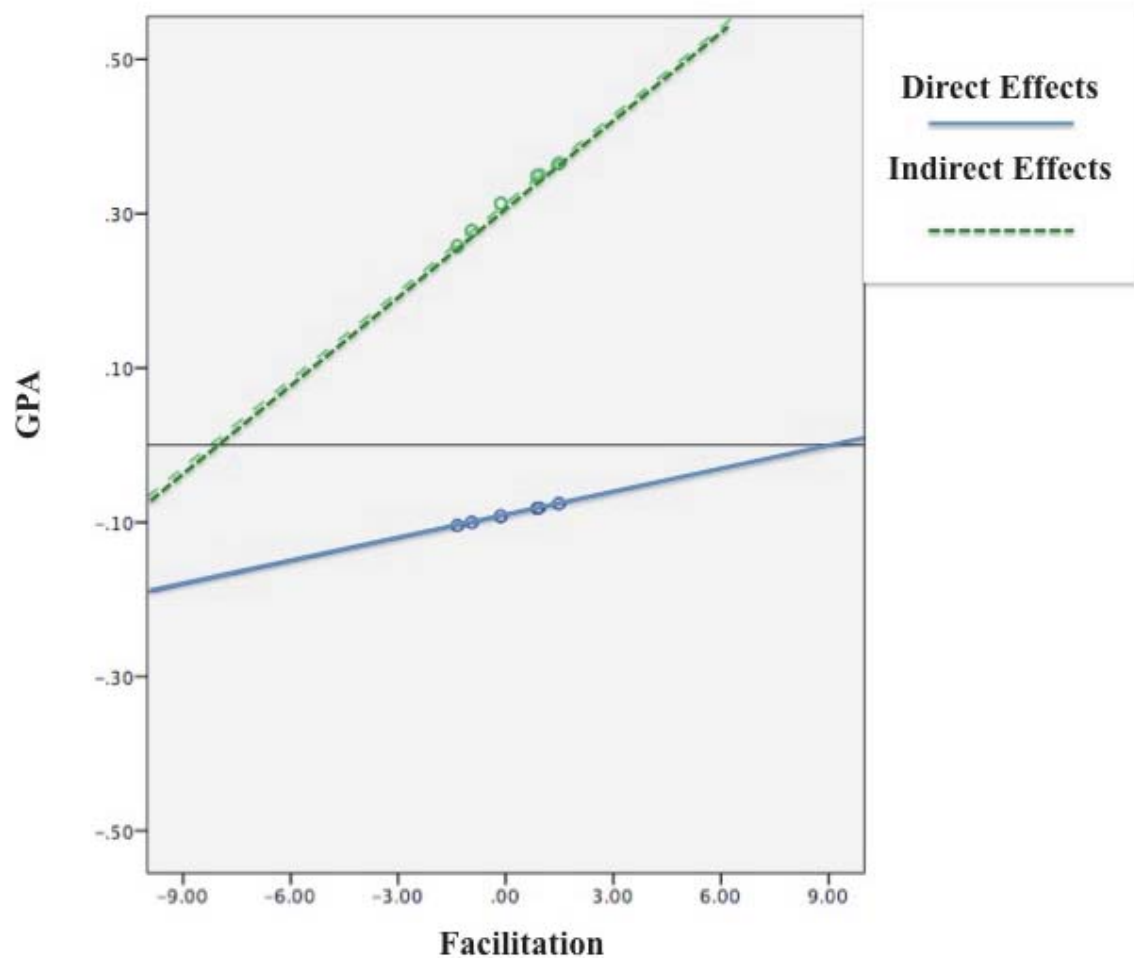
Figure 10. A visual representation of the conditional indirect and direct effects of self-regulation efficacy as a function of perceptions of inter-goal facilitation.

The data revealed an inverse relationship between self-regulation efficacy and GPA with regard to direct and indirect effects. It seemed that when the researcher did not account for multiple goals and interactions, GPA was higher when self-regulation efficacy was high and inter-goal interference was low, and GPA was lower when self-regulation efficacy was low and interference levels were high. However, it was also clear from the indirect effect vs. direct effect lines that, in general, GPA was simply higher when the researcher accounted for multiple goals, regardless of level of inter-goal interference. In the case of inter-goal facilitation as a moderator, high self-regulation

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efficacy and high facilitation tends were related to higher GPA for both conditional

indirect (include multiple goal factor scores) and direct (exclude multiple goal factor

scores) pathways.

The researcher conducted a formal test of moderated mediation in PROCESS

using a comparison of conditional indirect effects. The difference in conditional indirect

effects of self-regulation ($X$) on GPA ($Y$) through multiple goals ($M$) was tested using a

pick-a -point approach. In other words, the conditional effect of self-regulation efficacy

($X$) on GPA *(Y)* via multiple goals *(M)* was estimated at values for W = $w_1$ (value 1) and

$w_2$ (value 2) for perceptions of inter-goal interference, and Z = $z_1$ (value 1) and $z_2$ (value

2) for perceptions of inter-goal facilitation, respectively (Hayes, 2013). An inferential test

based on Bootstrap 95% confidence intervals for the combinations of self-regulation

efficacy ($X$) and these values of perceptions of inter-goal interference ($W$) and

perceptions of inter-goal facilitation *(Z)* were computed at various levels of perceptions

of inter-goal interference and facilitation using the following equations, where *a*

represents the effects of self-regulation efficacy ($X$) on multiple goal factor score ($M$) and

*b* represents the effects of multiple goal factor scores *(M)* on GPA *(Y)*:

$$a_{1i}b_{2i}(w_1 - w_2) + a_{3i}b_{1i}(w_1 - w_2) + a_{3i}b_{2i}(w_1^2 - w_2^2)$$

and

$$a_{1i}b_{2i}(z_1 - z_2) + a_{3i}b_{1i}(z_1 - z_2) + a_{3i}b_{2i}(z_1^2 - z_2^2).$$

PROCESS provided syntax that allowed for the estimation of 95% confidence intervals to

test whether there was a significant difference in the indirect effect of the low and high

inter-goal relations groups. The researcher conducted this estimation by first constructing

a new file with bootstrap confidence intervals for the moderated mediation model, and

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then computing the results of the aforementioned equations. If the Bootstrap confidence intervals, as calculated by the aforementioned two equations, for each respective group did not contain zero, the researcher deemed the conditional indirect effect between these groups to be significantly different (i.e., similar to an examination of line slopes; Hayes, 2013).

The results of these analyses indicated that the conditional indirect effect for students low vs. high in inter-goal interference was significantly different (Bootstrap interval = lower -12. 60 to upper -1.33), and that differences between students low vs. high in inter-goal facilitation was non-significant (Bootstrap confidence interval = lower -.03 to upper .53). According to Hayes (2013), "[A] bootstrap confidence interval for the indirect effect of self-regulation by interference (*XW)* that does not include zero provides evidence of moderated mediation" (p. 406). Interference scores have a significant moderating effect (i.e., slope is different from zero) on the relationship between self-regulation efficacy and GPA via multiple goals, and facilitation scores do not significantly alter this relation.

**Summary of Findings**

The current study supports several of the originally hypothesized relationships between variables. The data revealed a positive relationship between self-regulation efficacy and the goals students pursue. Self-regulation efficacy strongly predicted academic and social responsibility goals, as a group. As expected, academic and social responsibility goals and perceptions of inter-goal facilitation positively predicted GPA, while perceptions of inter-goal interference were negative predictors of academic performance. However, self-regulation efficacy was only a positive predictor of academic

performance when the researcher did not account for multiple goals. The data also

indicated that a negative (non-significant) relationship existed between self-regulation

efficacy and academic performance when the researcher included both multiple goals and

perceptions of inter-goal relationships in the moderated mediation model (see Tables 24

and 25). Figure 11 presents the regression path coefficients for the full moderated

mediation model.
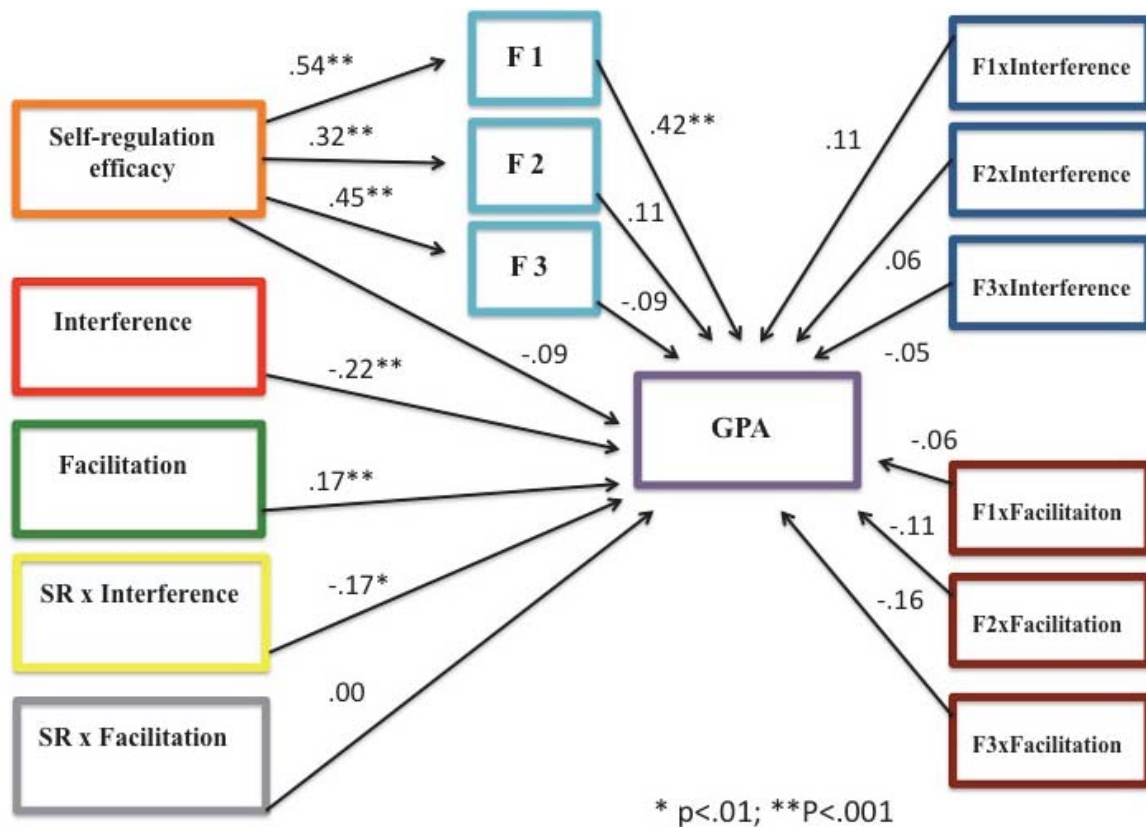


Figure 11. Model depicting moderated mediation regression results. F1, F2 and F2
represent multiple goal factor scores, SR = self-regulation efficacy.

These findings also indicate the need for a moderated mediation model that

examines the combined effects of self-regulation efficacy, multiple goal pursuit, and

perceptions of inter-goal interference and facilitation. Specifically, the data supported the

contention that students' multiple goals help explain (i.e., mediate) the effects of self-

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regulation efficacy on academic performance. Self-regulation efficacy was no longer a significant predictor of academic performance once the researcher accounted for students' multiple goals. Student perceptions of inter-goal interference also appeared to alter (i.e., moderate) the links between these variables. Particularly, the negative interaction between self-regulation efficacy and perceptions of inter-goal interference indicated that academic outcomes were worse for students both low in self-regulation efficacy and high in perceptions of inter-goal interference. Additionally, as expected, academic performance was highest among students with low perceptions of inter-goal interference and high self-regulation efficacy (see Figure 8).

Nevertheless, not all of the hypothesized relationships held. The data revealed only one significant interaction, which altered the pathway between self-regulation efficacy and academic performance rather than the pathway between multiple goals and academic performance. In addition, perceptions of inter-goal facilitation did not seem have a moderating effect on any relationships in the model. The next chapter will provide a discussion of these findings and their implications for the field.

**Chapter 5: Discussion**

The motivational components of self-regulation efficacy, multiple goals, and perceptions of inter-goal interference and facilitation are of critical importance to the academic performance of middle school students. This study examined the unique and collective influence of these variables on the academic success of students from two school districts in the Southeastern United States. Following this broad exploration, the researcher then addressed whether one could explain the relationship between self-regulation efficacy and GPA using multiple goal pursuit. Finally, the researcher tested a moderated mediation pathway model to explore whether perceptions of inter-goal relations altered the mediated effects of self-regulation efficacy on academic performance via students' multiple goals.

This chapter provides an interpretation of results for each of the constructs of interest in this study, as well as a general discussion and synthesis of the overall findings. The chapter concludes with suggestions about future directions for research that could extend the current understanding of the development, and maintenance, of the discussed motivational processes.

**Motivational Constructs That Predict Academic Performance**

This section describes the results of regression analyses that addressed how self-regulation efficacy, multiple goals, and  perceptions of inter-goal relations correlate with academic performance. Each construct and their respective effects are discussed separately.

**Self-regulation efficacy.**  Most of the motivational literature on self-regulation efficacy supports the idea that a relationship exists between higher levels of self-

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regulation efficacy and higher academic performance (see Valentine, Dubois, & Copper, 2004 for a review). However, in the current study, self-regulation efficacy was a non-significant negative predictor of GPA when goals were a part of the moderated mediation model. What factors would explain these results? Bandura and Locke (2003) criticized Vancouver and colleagues conclusions that belief in one's capabilities is detrimental to performance (Vancouver, Thompson & Williams, 2001; Vancouver, Thompson, Tischner, & Putka, 2002). They argued that such results failed to account for the impact of "counteracting self-efficacy and goal determinants" (Bandura & Locke, 2003, p. 94). According to the authors, higher self-efficacy can reduce efforts geared toward performance; however, it should also increase and promote higher goals that create larger discrepancies that drive performance (Bandura & Locke, 2003). This phenomenon produces a catch-22, wherein demotivating and motivating processes exist concurrently. Bandura and Locke (2003) also explained that Vancouver and colleagues did not address these counteracting influences.

The current study did address these potential counteracting influences, and results suggests that higher self-efficacy only produces a non-significant negative effect on academic performance when the researcher accounts for goals and perceptions of inter-goal interference (i.e., conflict between goals). Specifically, findings indicate that self-regulation efficacy, on its own, does have a positive effect on academic performance. Results further support the notion that higher efficacy levels predict higher levels of goal pursuit. However, when one accounts for perceptions of inter-goal interference, the effects of self-efficacy might change. This negative self-regulation efficacy effect can be conceived of as part of the demotivating processes that Bandura and Locke (2003) allude

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to. If a student believes that his or her goals interfere with one another, then their academic performance may suffer due to those perceptions, rather than the increased sense of capability and related goal aims. This study adds to the existing literature by suggesting that there is, in fact, a more complex relationship between self-regulation efficacy, goals, and academic performance than one might initially infer from indirect or direct effects, as these factors do not account for perceptions of the relations between multiple goals.

It is important to note, however, that the beta weight for the positive direct effects of self-regulation efficacy on academic performance when goals were not included in the model was $\beta = .08^*$, p <.05. This was only marginally different from the beta weight for the conditional direct effects between self-regulation efficacy and academic performance when goals and perceptions of inter-goal interference and facilitation were accounted for ($\beta = -.09$, n.s.). As such, the negative relation between self-regulation efficacy and academic performance, as well as the negative slopes seen in the interaction effect, could be a statistical artifact that would need to be replicated in future samples.

**Multiple goals.** Results of an exploratory factor analysis revealed that student goals fell into three main categories in this sample. This categorization differs from the original factor structure suggested by Ford (1992), and aligns with other research suggesting that goals can combine and belong to different categories than those proposed in the original taxonomy (e.g., Boekaerts, Smit, & Busing, 2012). In this sample, goals within the academic and social responsibility categories merged into one factor representing both academic (e.g., "Get good grades") and social responsibility goals (e.g., "Listen to my teacher; Factor 1). Another factor emerged containing goals related to

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autonomy (e.g., "Feel unique and special"), affect (e.g., "Feel happy"), inter-personal goals (e.g., "Make friends"; Factor 2), and prosocial goals ("Share with my classmates"; Factor 3).

As expected, increased self-regulation efficacy was most strongly predictive of the factor representing academic and social responsibility goals. This finding supports literature that suggests the presence of stronger effects when self-beliefs, cognitions, and achievement are in a related domain (Valentine, Dubois, & Cooper, 2004). A measure of efficacy for the self-regulation of academic behaviors should positively relate to, and accurately predict, the goals of "paying attention," "getting good grades," and "listening to the teacher" (Bandura et al., 2003).

Self-beliefs and goals in an academically related domain should positively relate to, and accurately predict, GPA, which represents an academic outcome. In fact, the factor representing academic and social responsibility goals was the only significant goal predictor in the any of the regression models. This finding aligns with prior research that stressed the importance of academic and social responsibility goals in predicting academic performance and related outcomes (e.g., Killian, Hofer, Fries &, Kuhnle, 2010; Wentzel, 1989, 1996; Wentzel, Fillisetti &, Looney, 2007; Wentzel, Battle, Russell &, Looney, 2010). Interestingly, in the sample of the present study, a positive relationship did not exist between prosocial goals and academic performance, as documented in previous studies (e.g., Wentzel, 1991; 1996; Wentzel, Fillisetti, & Looney, 2007).

It is important to note that the majority of these previous research studies included samples that consisted of middle-class Caucasian students. It is possible that the demographic characteristics of these samples had an effect on research outcomes, given

that the sample from the current study included students from low-socioeconomic backgrounds. Students from lower socioeconomic households are at risk for a number of academic difficulties, including lower levels of motivation and academic achievement (e.g., Anderson & Keith, 1997; Lent et al., 2001; Kerres & Kilpatrick, 2006). For example, in the current study, students who reported that their mothers did not graduate from high school had lower scores on self-regulation efficacy. Self-regulation efficacy, in turn, strongly and positively predicted the pursuit of academic and social responsibility goals. The pursuit of academic and social responsibility goals may be crucial for all students, and financially disadvantaged students may be at-risk for pursuing these less frequently due, in part, to lower levels of self-regulation efficacy related to markers of socioeconomic status (e.g., mother's educational level).

It is important to note that self-regulation efficacy was no longer a significant predictor of academic performance when the researcher accounted for goals and perceptions of inter-goal relations. One reason for this result may be that self-regulation efficacy served as a precursor or antecedent to the types of goals students pursued, and, in the end, influenced academic performance (e.g., Lent et al., 2001).

In addition, most students evaluated their perceptions of inter-goal interference and facilitation for goals that belonged to different categorizations. This finding supports the notion suggested by Wentzel (1993b, 2000) and others that students often face potential conflicts between their goals in school. Specifically, student respondents in the current study selected academic goals most often in the goal parings used to evaluate perceptions of inter-goal interference and facilitation. These results imply that perceptions of interference were a negative predictor of academic performance, in part,

due to perceived conflicts between academic goals and goals belonging to other categorizations. Likewise, the positive relationship between facilitation and academic performance suggests that students who believed that their academic goals helped them to achieve their secondary goals from different categories were more likely to perform well academically. This finding supports the contention that perceptions of inter-goal interference and facilitation are particularly important in relation to coordinating and pursuing academic goals related to academic success.

Students who can coordinate goals that are highly valued in the classroom (e.g., academic and social responsibility goals) with goals from other categorizations (e.g., inter-personal or affective goals) because they perceive them to be related to, rather than conflicting with, one another will likely continue to engage in patterns of behavior that increase teacher support (i.e., a contextual affordance related to goal pursuit) and goal attainment. These combined factors might then result in increased interest and effort in achieving these socially valued goals and culminate in higher levels of academic success (see Figure 1).

**Perceptions of inter-goal relations.** The current findings support the existing literature documenting the negative effects of perceived goal interference and goal facilitation on outcomes (Riediger, 2001; Riediger & Freund, 2004; Riediger, Freund, & Baltes, 2005). One would expect that perceptions of conflict between goals would have a negative influence on academic outcomes and that facilitation would exert a positive predictive effect on academic outcomes. Indeed, the current study revealed that perceptions of inter-goal interference were a negative predictor of performance, and perceptions of inter-goal facilitation were positive predictors of academic performance.

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Perceptions of inter-goal interference and facilitation were also significant predictors of academic and social responsibility goals, with interference emerging as a negative predictor, and facilitation a positive predictor, of such goals. These perceptions were unrelated to the remaining two factors.

Early adolescence is a developmental period associated with decreased academic performance (e.g., Eccles, Wigfield, Midgley, Reuman, & Feldlaufer, 1993) and increased inter-personal and peer-related social goals that might conflict with academic or social responsibility goal pursuit (Wentzel, 1993b, 2000). This phenomenon may result from the high importance of academic and social responsibility goals in school, combined with the tendency of perceived inter-goal interference to decrease the pursuit of goals that may be more challenging to attain in light of new contextual demands. Therefore, perceptions of interference might be particularly important in relation to academic performance for students during the middle school years.

Interestingly, there were no significant differences in perceptions of inter-goal interference for 6th, 7th and 8th graders in this sample. This might be due to the fact that interference, or conflicts, between goals were not classified into different categories in the current study. There is evidence that different types of goal conflicts exist, and that each is related to a specific set of emotions and goal content "themes" (Ridieger & Freund, 2008). For example, *want* conflicts are described as feelings that one desires to be engaging in a more enjoyable leisure activity when an obstacle is presented during goal pursuit. *Should* conflicts, on the other hand, are described as feelings that one should be doing something more responsible when an obstacle is encountered during goal

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pursuit. These *should* conflicts were often associated with an academic or work related goal (e.g., to study or work more).

If students were to specify whether they were experiencing *want vs. should* conflicts between their goals, perhaps we would find variations between 6th, 7th, and 8th grader responses. Given the decline in overall motivation (including levels of overall goal pursuit) throughout middle school (Eccles et al., 1993), one might expect 7th and 8th graders to experience more *want* conflicts than 6th graders. In the same vein, one might expect 6th graders to experience more *should* conflicts. Future research should address these potential differences by including a measure of the degree to which students experience *want vs. should* conflicts when perceptions of inter-goal interference are high.

Perceptions of inter-goal interference were also a significant and negative moderator of the relation between self-regulation efficacy and academic performance. Students with high perceptions of inter-goal interference and high self-regulation efficacy performed worse academically than those with low perceptions of inter-goal interference and low self-regulation efficacy. This seems counterintuitive. However, students that feel capable of regulating their academic behaviors, but find themselves challenged by obstacles in coordinating their goals, might experience demotivation and frustration that students who encounter these challenges when they do not feel capable of regulating their behaviors are exempt from.

Further, lower levels of perceptions of inter-goal interference were generally associated with higher academic performance regardless of level of self-regulation efficacy. These findings suggest that perceptions of inter-goal interference are generally

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detrimental to academic performance, and that this effect, if magnified for those students who want to and believe they can, regulates their behaviors to achieve academically.

In addition, results indicated that higher levels of self-regulation efficacy combined with higher levels of perceptions of inter-goal facilitation were associated with better academic performance than when lower self-regulation efficacy and perceptions of inter-goal facilitation presented. Perceiving goals as facilitative of one another was also predictive of the pursuit of academic and social responsibility goals (i.e., Factor 1).

Lastly, perceptions of inter-goal facilitation were positive predictors of academic and social responsibility goals (i.e., Factor 1). Perceptions that goals facilitate one another can increase students' academic performance by allowing them to pursue goals that are important to academic performance (e.g., academic and social responsibility goals) in tandem with other goals (e.g., affective and inter-personal goals). Although the interaction between self-regulation efficacy and facilitation was not significant in this sample, it is possible that self-regulation efficacy has an additive positive effect on academic performance when perceptions of inter-goal interference are lower and perceptions of inter-goal facilitation are higher.

The negative effects of perceptions of inter-goal interference should therefore be viewed as contingent on the nature of the conflict or interference (i.e., is it a *want vs. a should conflict?*) and whether the individual has the strategy knowledge to resolve the conflict. If a student perceives a conflict between two goals, but they also have strategies that can help them resolve the conflict, they may not experience the negative effects of perceptions of interference to the same degree as a student who does not possess such strategy knowledge.

For example, interference between more "desirable" leisure activities and other goals might be more prominent when cognitive load is high. If, however, one has the strategy knowledge and means (e.g., skills) to resolve a specific goal conflict, then the individual should be less likely to experience the *should* conflicts that are positively related to experiencing negative emotions. Riediger and Freund (2008) referred to this phenomenon as the *guilt-free effect*. If resources are strained, students could be more vulnerable to the psychological distraction of more fun or desirable activities. At the same time, they should be less likely to feel negative emotions associated with ignoring less enjoyable goals that are more conducive to productivity. This is because cognitive resources are freed due to available strategies that lessen the cognitive load associated with attending to goal conflicts.

One can also interpret the current findings within the broader context of ecological systems theory (Bronfenbrenner, 1989). Students who believe that their goals facilitate each other, with no inter-goal interference, would expand their strategy knowledge of successful goal pursuit over time. They would also, in turn, benefit from the increased motivation and more positive emotions associated with successful goal attainment (e.g., Verplanken & Holland, 2002). The reciprocal relation between said increase in strategy knowledge and positive emotions related to successful goal attainment, would lead to a more "automatized" goal coordination process, placing less strain on self-regulatory resources. The result of this successful goal coordination process, if students pursue academically related goals alongside other goals, is a higher likelihood of academic success.

The results of this study provide evidence that one can better understand the relationship between self-regulation efficacy and academic performance when considering both goals and perceptions of inter-goal relations. In addition, the separate effects of perceptions of inter-goal interference and facilitation confirm findings in the literature that call for separate measures for these constructs (e.g., Riediger & Freund, 2004; Riediger et al., 2005). An absence of perceptions of interference does not imply the presence of perceptions of inter-goal facilitation and, conversely, high perceptions of inter-goal facilitation do not necessarily imply lower perceptions of inter-goal interference. Each type of perception of inter-goal relations has unique effects in the goal coordination process.

**Synthesis of Findings**

To summarize, the current study found that the goals students pursue in the classroom, and their perceptions of the relationships between these goals, help to explain the relationship between self-regulation efficacy and academic performance. Academic and social responsibility goals are important predictors of academic performance above and beyond levels of self-regulation efficacy. Further, the perception that goals interfere with one another hinders academic performance, while the belief that goals facilitate one another enhances academic performance.

It appears that students need to believe that they can regulate their academic behaviors (i.e., self-regulation efficacy) to succeed in school, but they must also try to achieve adaptive goals (e.g., academic and social responsibility goals). Goal cognitions in particular seem connected to academic success. The findings from this study support the idea that without the goals of performing well in school (e.g., getting good grades) and

engaging in behaviors that facilitate learning (e.g., pay attention, listen to the teacher), the direct effects of self-regulation efficacy on academic performance decline, as indicated by mediation (see Tables 25 and 26).

Students must also perceive that their goals do not interfere with one another for the positive effects of increased self-regulation efficacy and goals to manifest (i.e., moderating effect). It seems as if one could extend the old adage, "I think therefore I am" to "I think therefore I am *capable*." We only exist insofar as we are capable of conscious thought. This notion does not imply that we always engage in conscious thought, rather, it is in consciousness that we find human essence. Further, we do not exist only because *we think*, we exist because our conscious thoughts help direct our behaviors, including behaviors related to ability. No one starts out automatically believing he or she is capable of anything, including academic success. At some point, personal and contextual influences combine to form conscious self-beliefs, some of which become habitual or automatic over time. Indeed, self-beliefs and goals alone do not explain academic performance. These cognitions and self-beliefs work in concert with perceptions related to the strategies that are necessary for engagement in goal-directed behavioral action.

This study contributes to the current literature on classroom motivation in several ways. First, the researcher explored a more complete process model of multiple goal pursuit. A more nuanced explanation for the relationship between multiple goals and academic performance emerged when the researcher accounted for self-regulation efficacy and perceptions of inter-goal relations. As Bandura and Locke (2003) suggested, individuals act to both control their self-beliefs and manage their life circumstances. Students' beliefs about their ability to self-regulate behavioral action are motivating, and

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better predict academic performance when one accounts for other processes linked to the execution of strategies that manage their contextual circumstances. In the classroom, this process includes the coordination of multiple goals that is contingent, in part, on perceptions of obstacles (i.e., interference) or facilitating factors related to concurrent goal pursuit. Although speculative, this full process model is likely to become particularly important as peer-related or non-academic social goals increase in importance during the middle school years. It is likely that during this time, students must become more strategic as they attempt to use their limited resources to accomplish a more diverse set of aims.

This study also clarified the ways that goal themes or categories established by Ford (1992) operate in a primarily minority sample that included many participants from low socioeconomic backgrounds. Findings suggest that, at least in this sample, goals related to academics demonstrated a strong relationship to each other. This finding remained true whether goals related to the themes of social responsibility (e.g., paying attention) or academics (e.g., getting good grades) from Ford's taxonomy. Autonomy, affective, and interpersonal goals, on the other hand, appeared to fall under the broad theme of non-academic goals. Finally, prosocial goals fell into a third themed grouping.

The researcher was careful to control for grade, race, and gender throughout the study. After the researcher accounted for all other variables, only gender remained a positive predictor of GPA, with females generally having higher GPA than males. This finding supported similar data in the existing literature (e.g., Long et al. 2007; Smrtnik & Zupancic, 2013). Past studies have found that girls pursued academic, social responsibility, and prosocial goals more frequently than males (e.g., Wentzel, 1989, 1994,

Wentzel, Battle, Russell, & Looney, 2007). In this study, girls pursued prosocial goals more frequently than did boys, but the rate at which students pursued other goals did not differ by gender.

Given these gender differences it is important to note that gender could be another moderating factor in the current study's model, particularly if academic performance is measured within sub-domains such as math or science. In general, girls outperform boys in reading (i.e., English) during the middle school years. They perform more poorly than boys, however, in math and science during the same time period (e.g., Bacharach, Baumeister, & Furr, 2003). If so, several of the proposed relations may vary by gender if only math and science or only English grades are considered. Although speculative, it is possible that girls would perceive more interference or conflict between their goals in this case. In addition, many other results could possibly vary: Would the role of self-regulation efficacy prove to be more significant for girls than boys? Could there relation between self-regulation efficacy, goals and academic performance be positive when the outcome is math and science for girls, while the relation is non-significant (or less significant) for boys? Conversely, if the academic outcome in question is reading or English would the relations be stronger for boys than they are for girls?

The current study also revealed that grade level was a positive predictor of the pursuit of all goals, with younger students reporting that they pursued academic, social responsibility, affective, autonomy, interpersonal, and prosocial goals more often than did older students, a finding supported in the literature (e.g., Wentzel, Battle, Russell & Looney, 2010). This finding could relate to a decline in motivation through the middle

school years (e.g., Eccles et al., 1993). However, grade level was not a significant predictor of GPA in the final moderated mediation model in the current study.

Finally, race proved to be a significant positive predictor of affective, autonomy and inter-personal goals, with Non-Caucasian students reporting lower pursuit rates of such goals than Caucasian students in the present study. Race was not a significant predictor of academic performance in the final moderated meditation model of the current study. However, performance in math and science has also been found to vary by race. Caucasian students outperform minority student in these domains (e.g., Bacharach, Baumeister, & Furr, 2003). There are also differences in reported engagement in math and science for boys and girls of different races, with girls who are African American or Latino reporting lower levels of engagement than their male counterparts (e.g., Martinez & Guzman, 2013). Could it be that self-regulation efficacy and pursuit of academic goals in math and science are even more important for minority students (and girls specifically)? These are variations that should be considered in future research.

**Limitations**

Although this study expanded the current literature, it also had limitations. These include limitations related to measurement and design. First, the model and supporting research questions reflected a single-shot correlational methodology. One would expect that students form goal hierarchies over time and, as such, the study did not focus on the conceptual antecedents of multiple goal pursuit. In other words, it is impossible to get a full picture of the other processes at work that might help explain the link between multiple goal pursuit and academic competency, including the influence of contextual supports from both teachers and peers (e.g., Wentzel, 2004, 2013). Secondly, with the

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exception of GPA, all data were self-reported. Teacher- and peer-rated measures of self-regulated behaviors in the classroom would help with validation and triangulation of these findings, as would observational measures of behaviors in the classroom. In addition, there is the issue of social desirability in self-report. Students might report pursuing academic or social responsibility goals more often than they actually do due to the high social value of such goals in the classroom.

Indeed, students reported academic and social responsibility goals as their Top Goal more frequently than almost any other goals (see Table 5). This result could be due to social desirability. Students know they should pay attention and get good grades, so it is possible that the goals they reported as their second or third Top Goal provided a more accurate reflection of the goals they want to achieve in school. Finally, several researchers have found a connection between emotions and goal pursuit (e.g., Illes & Judge, 2005; Turner et al., 1998; Verplanken & Holland, 2002). Measuring the effects of negative or positive emotional states and well-being on goal pursuit, self-regulation efficacy, and academic performance was beyond the scope of this study, but they remain important constructs of interest in understanding the goal coordination process.

The following section provides an exploration of potential avenues for future research that would account for the aforementioned limitations and extend our current understanding of motivational processes and the relationship between self-regulation efficacy, multiple goals, and academic performance. The section begins by detailing a more encompassing model of multiple goal pursuit and coordination that accounts for contextual factors including the role of teachers, parents, and peers in motivational processes and the pursuit of multiple goals. It then presents a discussion of how the

relationship between emotions, goal pursuit, and academic performance can provide a more complete understanding of the processes involved in goal coordination. The section concludes with suggestions for improving measurement and design related to multiple goal pursuit and coordination, as well as potential opportunities for inter-disciplinary research that addresses biological factors that are important to consider when studying the development of goal coordination skills.

**Directions for Future Research**

This section presents directions for future research in the area of multiple goal pursuit and coordination. This includes a discussion of alternative frameworks for examining goal coordination, the importance of emotions in studying multiple goal pursuit, methodological issues in examining the processes involved in goal coordination and biological considerations that provide a potential avenue for future interdisciplinary research in this area.

**Alternative models.** Students pursue both academic and social goals in the classroom. Researchers may differ in their beliefs about the role that these goals play in students' achievement, but evidence now supports the contention that students need to accomplish a variety of goals to succeed in school (Wentzel, 1993ab; Wentzel, 2004). Researchers have now started to examine the way contextual influences—including teachers, parents and peers—affect a student's ability to successfully manage these multiple, sometimes conflicting, goals and bring them into alignment (Boekaerts et al., 2006; Wentzel, 1993b; Wentzel, Baker & Russell, 2012).

Bronfenbrenner's (1989) ecological systems theory is particularly well-suited to address a person x process x context approach to understanding multiple goal pursuit and

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coordination. He suggests avenues of influence that explore the role of self-factors (i.e., person) as a function of the multiple contexts in which they are embedded (e.g., family, school, home), and discusses the ways that self-processes and contexts interact (i.e., process) to affect successful multiple goal pursuit (see Figure 1; Bronfenbrenner, 1989).

The philosophy behind this conceptual model is not new. Over a century ago, William James (1890) wrote about habit formation, goals, and the role of the human will (i.e., self-regulation). He described this will, or volition, as our sovereign ability to engage in actions that move us toward some desired state (James, 1890). He also suggested that one could divide the self into three parts: its constituents, the feelings, or emotions they arouse (i.e., self-feelings), and the actions that they prompt (James, 1890). He stated that "attention to one thing interferes a good deal with perception of the other" (James, 1890, p. 409), which alludes to the importance of executive functioning in determining the things to which one pays attention in the social environment.

Importantly, James (1890) noted that an individual's social self is at work within these constituents. He explained that "a man has as many social selves as there are individuals who recognize him... To wound any one of these his images is to wound him. But as the individuals who carry the images fall naturally into classes, we may practically say that he has as many different social selves as there are distinct *groups* of persons about whose opinion he cares" (James, 1890, p. 294). James noted long ago what Wentzel (2004) and others have explored empirically in recent years—that the people in an individual's social environment influence his or her motivations, emotions, self-beliefs, and actions. Although not the focus of this study, in the case of young adolescent students, teachers, parents, and peers are a vital part of the individual's social context James (1890) describes.

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Wentzel (2004) developed a model of classroom competence that describes the successful pursuit of academic and adaptive social goals that result from the relationship between the supportive self and social motivational processes in the context of school. Social-motivational processes encompass a range of social aspects in the classroom that can impact these self-processes. These aspects include instrumental and emotional support from, and the high expectations and values of, teachers and peers. Wentzel's work provides some empirical evidence of the role of teachers, parents, and peers in multiple goal pursuit (e.g., Wentzel, Baker & Russell, 2012; Wentzel, Battle, Russell, & Looney, 2010).

Despite the contributions of Wentzel's research, there is a lack of empirical data on the broader ecological systems model. This lack of information has left a visible gap in our basic knowledge about the goals students establish, how they think about these goals, and what they do to manage their multiple, potentially conflicting, goal states. Researchers have often failed to account for the mediational and moderating processes that affect goal coordination, as well as among the metacognitive, meta-motivational, and meta-affective states that affect students' goal coordinating skills. More importantly, they have not addressed the impact that contextual systems have on these factors.

If the successful pursuit of multiple goals is the result of a competency that includes adaptive goal coordination skills, researchers must begin to examine the role that environmental constituents (e.g., parents, teachers, peers) play in the development of said competency (Bronfenbrenner, 1989). Future research should examine the mechanisms through which these contextual supports interact with personal characteristics to maximize the potential for successful multiple goal pursuit. These supports, or affordances, include providing opportunities for personal goal achievement,

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being responsive to student needs, providing a warm and emotionally safe environment, and stating clear expectations (Wentzel, 2004; Wentzel, Battle, Russell & Looney, 2010).

Additionally, contextual affordances are directly related to the development and internalization of the socially valued goals discussed in the current study. One of the main goals of socialization is to help individuals adopt adaptive societal values as their own (Maccoby, 2007). Some people refer to this process as the internalization of values, a process whereby one comes to enact socially desirable behaviors autonomously, without the need for external pressure (Grolnick, Ryan, & Deci, 1991; Grusec, Goodnow, & Kuczynski, 2000).

Higher levels of internalization are related to several positive school outcomes including higher quality learning, academic achievement, and levels of prosocial goal pursuit (e.g., Grolnick, Ryan, & Deci, 1991; Ryan, Connell, & Plant, 1990; Wentzel, Filisetti & Looney, 2007). A significant body of literature links parenting practices and behaviors to levels of internalization (Asakawa, 2001; Hardy, Padilla-Walkera, & Carlo, 2008; Hastings & Grusec, 1997; Hoffman, 1994). A smaller fraction of the socialization literature has focused on examining the effects of teachers and peers on the internalization of values (Collins, Gleason, & Sesma, 1997; Kaufman & Dodge, 2009).

This smaller body of research suggests that teachers can serve as agents of socialization by influencing the quantity and quality of internalization (Wentzel, 2002). Educators can accomplish this aim by creating optimal learning contexts that include setting clear classroom goals and expectations (Pianta, 1992), maintaining a nurturing and caring environment (Wentzel, 1997, 1998), and providing autonomy support (Deci et al., 1981; Deci, Eghrari, Partick, & Leone, 1994; Grolnick & Ryan, 1989). Researchers

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have related these factors to positive motivational and performance outcomes, including academic interest and higher GPAs (Pianta, 1992; *see* Wentzel & Wigfield, 1998 for review), academic effort and social responsibility goals (Wentzel, 1997, 1998, 2002, 2013), levels of perceived competence and intrinsic motivation (Deci et al., 1981), increased identification with achievement values over time (Grolnick & Ryan, 1989), and persistence on tasks (Deci, Eghrari, Partick, & Leone, 1994).

Although the relationship between these contextual factors and academic outcomes is fairly well established, insufficient data exist on the link between contextual factors, academic outcomes, and levels of student internalization of academic values. For example, researchers have yet to explore the extent to which teachers endorse different academic and socialization goals or how teaching practices affect the association between teachers' goals and students' internalization of these goals. Future inquiries should also explore how teachers contribute directly to the development of goal coordination skills, explicitly (e.g., pointing out communalities in academic and non-academic goals, "If you pay attention, it is easier to get good grades") or implicitly (e.g., by providing social support, by providing opportunities for group work inside and outside of the classroom).

Future research could expand upon existing literature by (a) investigating the types of socialization goals teachers and peers pursue in the classroom and (b) examining the moderating effects of teacher and peer behaviors on students' reasons for internalizing and pursuing adaptive academic and social goals. Further, certain types of academic goals and strategies are linked to academic performance, in part, because they facilitate learning. Apart from the obvious problems that result from not paying attention in class (e.g., missing content), a student who cannot manage to follow directions (e.g., a

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social responsibility goal) or behave appropriately (e.g., pay attention) might experience rejection in a mainstream classroom. This rejection can lead to a lack of support from both teachers and peers that students often need to succeed academically (Wentzel, 1994; Wentzel et al., 2010). Future studies should address the influence of supports from parents, teachers, and peers on the goals students set and maintain through the middle school years, and how the internalization and adoption of goals impacts the goal coordination process examined in this study (Wentzel, 2004).

**Emotions.** Another important avenue of influence could emerge when one accounts for emotions in the goal coordination process. Emotions play an important proximal role in the pursuit of multiple goals and warrant discussion as a part of a broader conceptual model of multiple goal pursuit (Bandura, 1986; Bronfenbrenner, 1989). Indeed, Bandura (1997) argued that natural link exists between affect and goal-directed behavior. Karoly (1993) argued that this relationship results from feelings that arise in response to experiences with success, failure, frustration, and the slowing or delay of goal pursuit.

Emotions may also significantly alter how, when, and with what fervor individuals pursue both short- and long-term goals (Wentzel, 2004). For example, a high level of perceived goal interference could lead to the slowing, delay, or abandonment of efforts to attain certain goals that impact a student's current and future emotional states. Emmons and King (1988) found that students who perceived high levels of goal conflict also reported higher rates of negative emotional states, including depression, anxiety, and neuroticism. In the same vein, Verplanken & Holland (2002) concluded that students who experienced high levels of negative affect (e.g., anxiety) were less prone to take actions

that maximized the attainment of a goal. For instance, a student's propensity to experience negative affect after failure (e.g., I feel terrible when I make a mistake in math) decreases the likelihood that, after such failure, they will engage in actions that are conducive to future goal achievement. This predisposition to experience negative affect decreases the likelihood of actions directed toward the attainment of future goals (Turner et al., 1998).

Other researchers have documented the moderating role of affective states on the goal-setting process. In a study of university students, Ilies and Judge (2005) found that positive affect (e.g., excited, alert vs. distressed, hostile, scared) moderated the relationship between performance feedback and subsequent goal setting (e.g., I want to perform better than "X%" of participants), such that positive affect helped prevent the lowering of goals after negative feedback. Conversely, if the individual experienced negative affect, they were more likely to set lower goal standards for themselves (Ilies & Judge, 2005).

Levels of psychological well-being can also impact and reflect the degree to which students experience difficulties in the goal coordination process throughout their lives (Blech & Funke, 2010; Reidiger & Freund, 2004). For example, Blech and Funke (2010) found that in a computerized experimental task where participants were told to select solutions for problems based on various goals (e.g., contentment of passengers, productivity of employees in a fictitious shipping company), individuals exposed to an antagonistic goal manipulation (i.e., there was no increase in score because the goals were in conflict with each other) had a decline in the number of "interventions" selected to deal with the problem/goals from the first to the second trial. Moreover, perceived

stress levels were higher for the groups exposed to an antagonistic or conflicting goal condition. Although this study used an adult sample, it is reasonable to assume that higher levels of goal interference (which can serve as an obstacle to goal coordination) may lead to lower levels of effort (in this case, selecting less intervention solutions) and psychological well-being throughout the life course.

There is a dearth of research examining the relationship between emotions, well-being, goals, inter-goal relations, and academic performance in younger samples. Future studies should examine the mediating or moderating effects that emotions and well-being have on motivational processes at younger ages. These studies should also be longitudinal in nature, providing evidence of the causal direction, and magnitude of influence, of emotions on the pursuit of multiple goals and the goal coordination process.

**Design and measurement.** The existing literature lacks studies about multiple goals and academic performance that do not solely rely on self-reported data. A review of the literature revealed only one research team that used a combination of self-reports and observational methods to measure goal content. De Lemos and Goncalves (2004) conducted a qualitative study on 6th grade students using videotaped observations and interviews to establish a goal content categorization system for students' multiple classroom goals. They came up with four categories:

- complying goals- directed toward compliance with classroom norms and routines;
- working goals- motivated by the working dimension of the class ("To finish it", "To get it done");
- evaluation goals- directed towards evaluation concerns; and

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- relational goals- motivated by a desire to maintain and develop positive relationships with teachers or peers (De Lemos & Goncalves, 2004).

The researchers then used these categorizations to examine the different sequences of goals that students pursued in the classroom and the duration and frequency of time students spent on each individual goal (De Lemos & Goncalves, 2004). Researchers observed behavior and inferred the goals that students pursued, and students later watched videos of themselves and described what they were trying to achieve (i.e., stated goals). De Lemos and Goncalves found that students often stated many goals beyond those inferred by the researcher's observation.  For example, in a situation where the teacher told a student to copy something from the blackboard, the observed behavior was the student writing in their exercise book. In this case, the inferred goal was one of compliance. However, when the student gave a statement of their goals, it was apparent that the student was pursuing other goals through the behavior: "I'm writing it down….also because the teacher notices my effort in the classroom; of course I try to get good grades." This statement is indicative not only of compliance, as defined by the researchers, but also evaluation goals and perhaps even the social-relational goal of pleasing the teacher and being well-liked.

The De Lemos and Goncalves (2004) study is an exemplary examination of multiple goals in a natural classroom setting. Indeed, researchers should aim to design inquiries that combine qualitative and quantitative methods when studying multiple goals in the classroom. Experimental methods, such as those used by Blech and Funke (2009) could also be adapted to examine how younger samples react to simulated goal conflicts. Admittedly, these methods are more expensive and time consuming to execute; however,

they provide a more complete picture of the goal coordination process that many researchers wish to explore and warrant the attention and funding of motivational researchers in the future.

**Biological considerations.** It is often useful to search outside of the traditional literature if one wishes to gain a clear understanding of certain phenomena. When seeking to comprehend how or why something as complex as multiple goal coordination skills and abilities develop, it might be necessary to look beyond the journals in educational psychology. Research in brain development and neuroscience seems like a particularly fruitful resource in this regard. There is considerable research documenting the development of *physical* coordination skills in infancy and early childhood that relate to performance on physical coordination tasks (e.g., Birtles et al., 2011) and demonstrating that individuals can improve these psychomotor skills (e.g., Taylor, Fayed, & Mandich, 2007). Could the development of "non-sequential" (i.e., more strategic) bi-manual coordination in infancy be related to differences in the ability to coordinate goals later in life; or does the neural circuitry involved in physical coordination completely develop separately from that which it is required for more complex cognitive coordination tasks?

If these two circuits are not as separate as they appear in academic journals, it is possible that a closer examination of motor development (particularly the strengthening of inter-hemispheric transfer via the corpus callosum) in schoolchildren could be beneficial. Without physical exertion, young children would have difficulty learning to coordinate their physical movements (Birtles et al., 2011, Bos et al., 2009). Do we have any reason to believe that more complex coordination skills are attributable to completely

separate brain circuitry than those required by the simple tasks assigned by Taylor and his

colleagues (2007) in very young children (e.g., to ride a bike, build Legos)?

Our school systems serve children engaging in significantly less physical activity

than they did 20, or even 10, years ago. If practice makes perfect, the odds are against our

students when it comes to developing the psychomotor skills that might link to later

cognitive coordination skills. Indeed, the very circuits that Birtles and his colleagues

(2011) described as crucial for the development of motor coordination could be related to

the inexplicable jump in cases of learning disabilities, including ADD and ADHD, in our

schools. Schools may be describing these students as unable to "get it together,"

"coordinate goals," or act in a "strategic or planful" (i.e., self-regulated) manner in

school. Perhaps one can explain this jump in learning disabilities, and the related increase

in the number of students lacking self-regulatory skill, by understanding how more

complex brain and cognitive systems develop over time.

Researchers have found that children placed in institutionalized care at an early

age (three months) performed more poorly on visual memory and executive functioning

tasks than those who never experienced institutionalized care (e.g., Bos et al., 2009). In

addition, children randomly assigned to foster care (i.e., non-institution setting) after

experiencing institutionalized care, also demonstrated better organizational strategies on

an executive functioning task than those who remained in institutional care (Bos et al.,

2009). In addition, children in institutionalized care are often deprived of physical

movement and stimulation. Indeed, there is substantial evidence that physical and

psychosocial depravation (often associated with poverty) impacts brain development

throughout the life course (e.g., Hackman & Farah, 2009).

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Research on the development of brain regions, including the corpus callosum (part of the medial temporal lobe), indicate that the development of interhemispheric communication (or the ability to build neuronal networks that give feedback to higher order executive functioning) is accelerated (i.e., crucial) during the first weeks of life, and again during middle childhood. These neuronal networks help children develop the ability to reduce extraneous information in their visual environments, and decrease structural redundancy in neuronal networks (Knyazeva, 2013). It is reasonable to suppose that children with stronger interhemispheric connections have an advantage when it comes to self-regulation, attention, strategy development and other higher order executive functions linked to goal coordination.

A review by Bolger, Mackey, Wang, and Grigorenko (2014) supported the contention that the critical and analytical thinking (CAT) skills (Alexander, 2014) related to the higher order thinking necessary for goal coordination are dependent, in part, on the activation and development of the medial temporal lobe (related to declarative memory) and the pre-frontal cortex (related to executive functioning). The executive function system is important because it relates to an individual's ability to consider multiple pieces of information (e.g., coordinate multiple goals), and the declarative memory system impacts the ability to store and retrieve strategy knowledge related to multiple goal pursuit and coordination (Bolger et al., 2014). Areas of the brain related to the development and functioning of these two brain regions are negatively impacted by stress, and children from a lower socioeconomic backgrounds (or who are deprived of psychosocial affordances; Bos et al., 2009) often experience such stressors (Bolger et al., 2014).

In sum, the "self" in self-regulation is likely a function of deeply engrained neurological structuring that takes place far before a student ever sets foot in a middle school classroom. Further, its development may rely on, or closely relate to, neurological and psychomotor developmental markers and progressions. Attempting to rectify failures in the goal coordination process without first addressing the potential biological underpinnings related to its development is difficult at best. This area holds much promise for future interdisciplinary research.

**Applications in the classroom**

The results of the current study have several real world applications. The first deals with what teachers can do to facilitate the coordination of student goals. The second is to apply what we know about students goals in the classroom into assessments. What can teachers do? Teachers can have high expectations and provide emotional support for their students. They can create a classroom environment where dual goals can be more easily achieved. For example the goals of making friends and getting good grades can be achieved more easily in a classroom where group work is readily available. Teachers can also stress the importance of self-monitoring and goal coordination. Something as simple as saying: "Today's lesson is related to tomorrow's lesson on X", "If you do this assignment with your friends, wouldn't that be more fun?", "When you see this video are you understanding how X is related to Y?", or "While you do your reading ask yourselves these important questions" can help bring the skills linked to goal coordination into students' consciousness.

Teachers could also use technology to aid in the development of goal coordination skills. They could use computerized tasks where students have to select solutions to

problems based on a lesson, and then provide "obstacles" or challenges to those solutions when they present another "goal" or piece of information to consider (e.g., What's another way to solve that problem given this new information?). This would encourage critical thinking skills by encouraging students to monitor their thinking, while also expanding their strategy knowledge regarding how to solve the initial "problem" and achieve multiple goals.

In addition, tailored alternative assessments may help students accomplish their academic and non-academic goals more readily. After all, it is clear students have affective goals (e.g., have fun) in the classroom. Why not have assessments that facilitate the association and achievement of both academic and affective goals? Traditional testing methods where students simply memorize information or fill out multiple choice tests might allow students to achieve the goal of "getting a good grade" (if they perform well), but not present the opportunity to achieve the goal of "having fun" in tandem. A teacher could have exams that are more applied or hands-on in nature (i.e., more fun) in order to facilitate the achievement of both of these goals.

One example of this used with elementary students that seems promising was an exam meant to tap into knowledge of animal adaptations. Students constructed origami frogs that had either a masking tape "tongue" with adhesive or a non-adhesive surface. Students then used those materials to "test" whether one type of tongue was better suited to "catch" paper flies. They also had to write up a report of hypotheses, methods and results of the experiment (Edwards, 2015). This type of exam tests students' knowledge about adaptation in a way that may foster more creativity and curiosity in the future. Similar assessments can be designed to test science knowledge in middle school students.

**Conclusion**

The findings from the current study suggest that perceptions of inter-goal interference and facilitation provide a more complete picture of the relationship between self-regulation efficacy, multiple goals, and academic performance. The positive effects of self-regulation efficacy on academic performance, in particular, seem negatively impacted by high perceptions of inter-goal interference. Findings also suggest that believing one can coordinate academic and social responsibility goals with other goal types (i.e., perceiving goals as facilitative and not interfering with one another) is of critical importance, above and beyond other goals and self-regulation efficacy, in predicting academic performance.

Future studies should continue to examine the complexity of these relationships. The role of emotions, contextual affordances (e.g., teacher and peer support), memory, and attention would add to the current knowledge base about the goal coordination process. How do students learn to coordinate their goals, and at what point are contextual affordances most critical in solidifying successful goal coordination strategies? What influences a students' proclivity to see their goals as mutually exclusive vs. convergent? More importantly, what influences the strength of association between goals and a given course of action to attain those goals? If an individual determines that several goals are attainable, how does he pursue them? To answer these questions, future studies must examine the cognitive processes in which individuals engage during the cycle between goal establishment and attainment. Specifically, researchers should explore the role that consciousness, attention, and memory play in determining a student's ability to coordinate their goals.

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It is also necessary to examine these constructs using both self-report and observational methods. Using multiple data collection methods will help bridge the gap between the cognitive processes involved in goal coordination and the behavioral action linked to successful multiple goal attainment.

Finally, the field of neuroscience can further our understanding of critical developmental periods during which individuals form the neuronal connections essential to executive functioning and higher cognitive processing, including goal coordination. Interdisciplinary research in this area would add to the knowledge base about why something as complex as the coordination of goals appears to come more easily to some students than it does to others. Someday, we might realize that what was once exclusively attributed to conscious motivation (or lack thereof), is actually the end result of the reciprocal relationship between biological and contextual (e.g., affordances of parents, teachers and peers) factors that manifest in motivational constructs.

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**Inter-goal Relations Questionnaire (IRQ, Riediger, 2001) and Goal Content Survey (Ford, 1992).** Please see PDF print images of the survey as it appeared to students.

Codes: AC = academic goals, AF = affective goals, SR = social responsibility goals, PS = prosocial goals, IP = interpersonal. AU = autonomy goals. Codes did not appear on the actual computerized survey. Goals were adapted from Ford and Nichols' Taxonomy of Human Goals (1992).

**Goals listed on the computerized survey in Likert-scale and dropbox format.**
1. Feel happy (AF), 2. Pay attention (SR), 3. Make friends (IP), 4. Learn new things (AC), 5. Cheer someone up a classmate who is sad (PS), 6. Be challenged (AC), 7. Have fun (AF), 8. Follow rules (SR), 9. Be part of a popular group (IP), 10. Give help to my classmates (PS), 11. Feel relaxed with no stress (AF), 12. Share with my classmates (PS), 13. Feel unique and special (AU), 14. Get good grades (AC), 15. Have good relationships with my friends (IP), 16. Listen to my teacher (SR), 17. Make my own decisions and choices (AU), 18. Feel confident about myself (AU).

All 18 goals were first rated on a 6 point Likert-scale. Students were then presented with a dropbox goal bank containing the following goals and asked to rate their top 3 goals. The top two goals were then electronically inserted into their respective places for the Inter-goal Relations Questionnaire (IRQ, Riediger, 2001).
Survey items appear in the same order they did in the computerized survey.

### "Things I Try to do at School" Survey

Instructions: Please circle the number that best describes how often you might try to do the activities listed at school. (Note: All 18 goals were rated).

### How often do I try to do this at school?

1. Pay attention

| Never | Seldom | Sometimes | Often | Almost Always | Always |
|-------|--------|-----------|-------|---------------|--------|
| 1 | 2 | 3 | 4 | 5 | 6 |

2. Make friends

| Never | Seldom | Sometimes | Often | Almost Always | Always |
|-------|--------|-----------|-------|---------------|--------|
| 1 | 2 | 3 | 4 | 5 | 6 |

3. Get good grades

| Never | Seldom | Sometimes | Often | Almost Always | Always |
|-------|--------|-----------|-------|---------------|--------|
| 1 | 2 | 3 | 4 | 5 | 6 |

4. Feel happy

| Never | Seldom | Sometimes | Often | Almost Always | Always |
|-------|--------|-----------|-------|---------------|--------|
| 1 | 2 | 3 | 4 | 5 | 6 |

## "Things I try to do at school" Survey

**Instructions:**

Please choose the top three most important activities you try to do at school. (Note: Goals were listed in drop down format, student were instructed to not select the same goal more than once).

The Most Important Activity you try and do at school
Activity #1 _____

The SECOND Most Important Activity you try and do at school
Activity #2 _____

The THIRD Most Important Activity you try and do at school
Activity #3 _____

**"Things I try to do at school"**

The next few pages will ask you questions about how the activities you try and do at school work together. **DIRECTIONS:** Please answer the following questions about your top choice activities.

Activity # 1 _____ Activity # 2 _____

Now select the number that best describes how you feel about these activities at school:

How often does trying to do Activity # 1 at school………

1. mean you spend less time trying to do Activity # 2 at school?

| Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|------------|-----------|-------|------------------|---------------|--------|
| 1 | 2 | 3 | 4 | 5 | 6 |

2. mean you put less effort into trying to do Activity # 2 at school?

| Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|------------|-----------|-------|------------------|---------------|--------|
| 1 | 2 | 3 | 4 | 5 | 6 |

How often does trying to do Activity # 2 at school………

3. mean you spend less time trying to do Activity # 1 at school?

| Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|------------|-----------|-------|------------------|---------------|--------|
| 1 | 2 | 3 | 4 | 5 | 6 |

4. mean you put less effort into trying to do Activity # 1 at school?

| Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|------------|-----------|-------|------------------|---------------|--------|
| 1 | 2 | 3 | 4 | 5 | 6 |

How often does trying to do Activity # 1 at school………

5. help you do Activity # 2 at the same time at school?

| Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|------------|-----------|-------|------------------|---------------|--------|
| 1 | 2 | 3 | 4 | 5 | 6 |

6.  mean you do something that makes you do Activity # 2 less often at school?

| Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |

How often does trying to do Activity # 2 at school………
7.  help you do Activity # 1 at the same time at school?

| Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |

8.  mean you do something that makes you do Activity # 1 less often at school?

| Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |

**Self-Efficacy for Self-Regulation (Academic; Bandura et al., 2003)**

Rated on a 5 point Likert scale (1 = very well and 5 = not at all well)

*"How well can you……"*

1. Finish your homework assignments by deadlines

2. Get yourself to study when there are other interesting things to do

3. Always concentrate on school subjects during class

4. Take good notes during class instruction

5. Plan your schoolwork for the day

6. Organize your schoolwork

7. Arrange a place to study without distractions

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# PDF of Computerized survey

Welcome to the
**"Things I Try to Do at School" Survey!**

Please answer the following questions:

**Index card ID #**

[                    ]

**First Name:**

[                    ]

**Last Name:**

[                    ]

**Gender:**

◯ Male

☑ Female

**Grade:**

◯ 6th

◯ 7th

☑ 8th

**Race:**

◯ White

◯ African American

☑ Hispanic

◯ Non-Hispanic Black

◯ Asian

◯ Indian

◯ Other (please specify)

[                              ]

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## "Things I Try to Do at School"

### How far did your mother go in school?

- ◯ Did not graduate from High School
- ✔ High School
- ◯ Some College
- ◯ College Degree
- ◯ I don't know

### How far did your father go in school?:

- ✔ Did not graduate from High School
- ◯ High School
- ◯ Some College
- ◯ College Degree
- ◯ I don't know

[Prev]   [Next]

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## "Things I Try to Do at School"

DIRECTIONS: Please select the choice that best describes how often you might try to do the activities listed at school.

**How often do I try to do this at school?**

| | Never | Seldom | Sometimes | Often | Almost Always | Always |
|---|---|---|---|---|---|---|
| Feel happy | | | ✔ | | | |
| Pay attention | | ✔ | | | | |
| Make friends | | | | ✔ | | |
| Learn new things | | | | | | |
| Cheer up a classmate who is sad | | ✔ | | | | |
| Be challenged | ✔ | | | | | |
| Have fun | | | ✔ | | | |
| Follow rules | | ✔ | | | | |
| Be part of a popular group | | | | ✔ | | |
| Give help to my classmates | | ✔ | | | | |
| Feel relaxed with no stress | | | | | | |
| Share with my classmates | | | | ✔ | | |
| Feel unique and special | | | | | | ✔ |
| Get good grades | ✔ | | | | | |
| Have good relationships with my friends | | ✔ | | | | |
| Listen to my teacher | | ✔ | | | | |
| Make my own decisions and choices | ✔ | | | | | |
| Feel confident about myself | | ✔ | | | | |

## "Things I Try to Do at School"

**DIRECTIONS:**

Please select the top three most important activities you try to do at school.

**The Most Important Activity you try to do at school**

[ ⌄ ]

**The SECOND Most Important Activity you try to do at school (DO NOT pick what you did for Activity #1)**

[ ⌄ ]

**The THIRD Most Important Activity you try to do at school (DO NOT pick what you did for Activity #1 or Activity #2)**

[ ⌄ ]

**List of activities:**

1. Feel happy
2. Pay attention
3. Make friends
4. Learn new things
5. Cheer up a classmate who is sad
6. Be challenged
7. Have fun
8. Follow rules
9. Be part of a popular group
10. Give help to my classmates
11. Feel relaxed with no stress
12. Share with my classmates
13. Feel unique and special

14. Get good grades
15. Have good relationships with my friends
16. Listen to my teacher
17. Make my own decisions and choices
18. Feel confident about myself

## "Things I Try to Do at School"

**"Things I try to do at school"**

Sometimes the things we try to do at school work well together. For example, if you try and "participate in sports" at school, it may be easier to also "be healthy" at school. Other times the things we try to do at school do not work well together. For example, if you try and "start a new club" at school, it may be hard to also try and "have free time" at school.

The next few pages will ask you questions about how the activities you try and do at school work together.

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**DIRECTIONS:** Please answer the following questions about your top choice activities.

**Have fun** and **Get good grades**

Now select the number that best describes how you feel about these activities at school:

**How often does trying to *have fun* at school.........**

|  | Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|---|
| make me spend less time trying to *get good grades* at school? |  |  | ✓ |  |  |  |

**How often does trying to *have fun* at school.........**

|  | Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|---|
| make it harder for me to try to *get good grades* at school? |  |  |  | ✓ |  |  |

**How often does trying to *get good grades* at school.........**

|  | Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|---|
| make me spend less time trying to *have fun* at school? |  |  | ✓ |  |  |  |

**How often does trying to *get good grades* at school.........**

|  | Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|---|
| make it harder for me to *have fun* at school? |  |  |  |  |  | ✓ |

**How often does trying to *have fun* at school.........**

|  | Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|---|
| help me *get good grades* at the same time at school? |  |  |  |  | ✓ |  |

**How often does trying to *have fun* at school.........**

|  | Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|---|
| make me do something other than *get good grades* at school? | ○ | ○ | ○ | ✓ | ○ | ○ |

**How often does trying to *get good grades* at school.........**

|  | Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|---|
| help me *have fun* at the same time at school? | ✓ | ○ | ○ | ○ | ○ | ○ |

**How often does trying to *get good grades* at school.........**

|  | Not at all | Sometimes | Often | Most of the time | Almost Always | Always |
|---|---|---|---|---|---|---|
| make me do something other than *have fun* at school? | ✓ | ○ | ○ | ○ | ○ | ○ |

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## "Things I Try to Do at School"

**Directions:** Please select the choice that best describes you.

### How well can you......

| | Not at all | Sometimes | Often | Almost Always | Always |
|---|---|---|---|---|---|
| Finish your homework assignments by deadlines | ○ | ☑ | ○ | ○ | ○ |
| Get yourself to study when there are other interesting things to do | ○ | ☑ | ○ | ○ | ○ |
| Always concentrate on school subjects during class | ○ | ☑ | ○ | ○ | ○ |
| Take good notes during class instruction | ☑ | ○ | ○ | ○ | ○ |
| Plan your schoolwork for the day | ☑ | ○ | ○ | ○ | ○ |
| Organize your schoolwork | ☑ | ○ | ○ | ○ | ○ |
| Arrange a place to study without distractions | ○ | ☑ | ○ | ○ | ○ |

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# Appendix B: Supplementary Tables & Figures

**Models with self-regulation efficacy predicting multiple goal scores and GPA.**
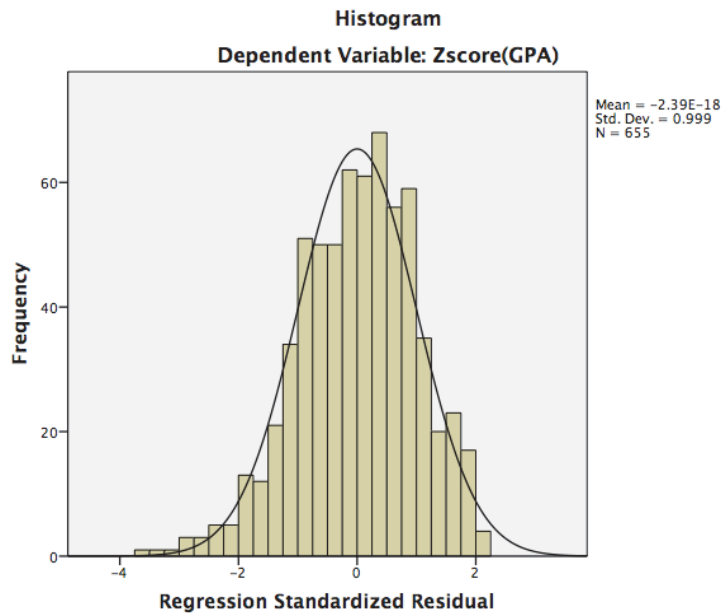


Figure B1. Histogram of GPA residuals.
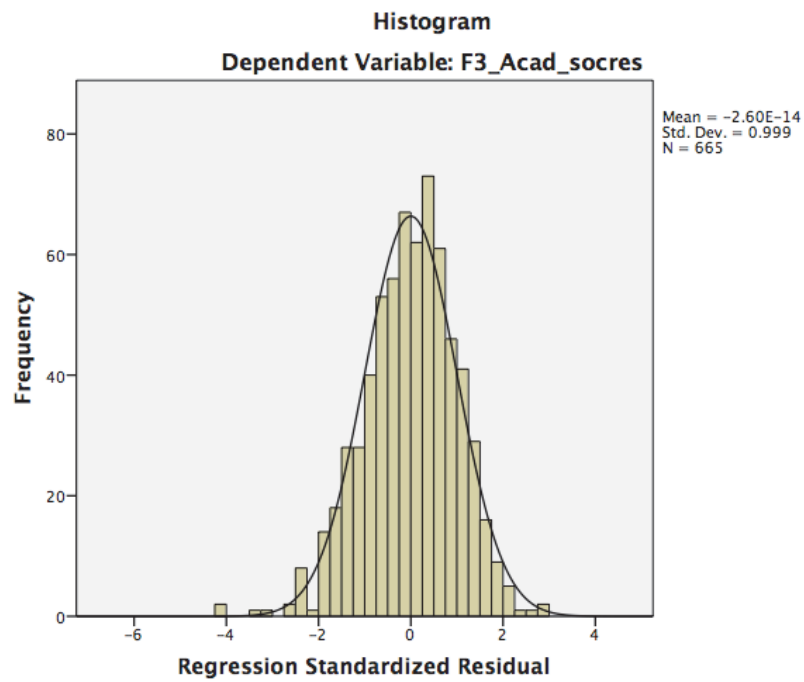


Figure B2. Histogram of Factor 1 residuals.
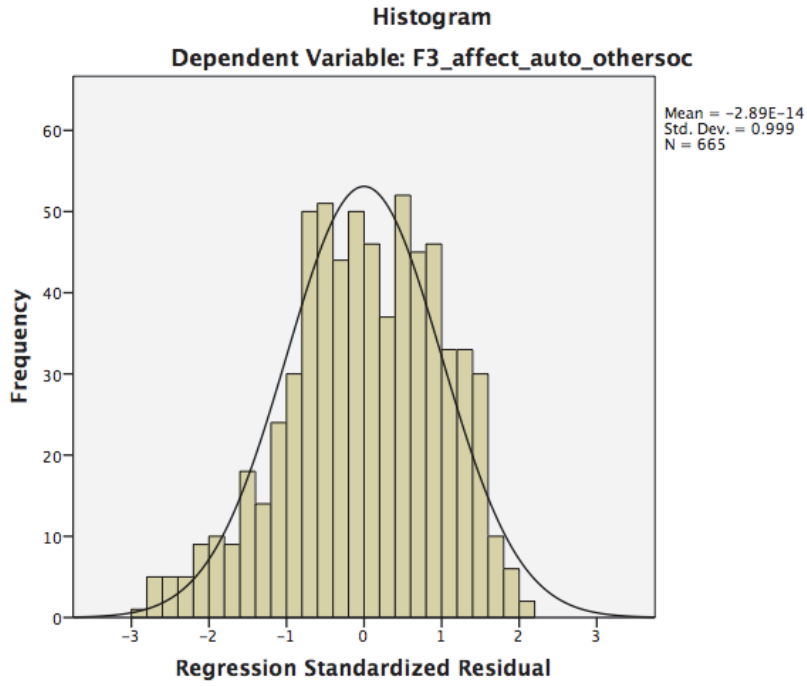
Figure B3. Histogram of Factor 2 residuals.
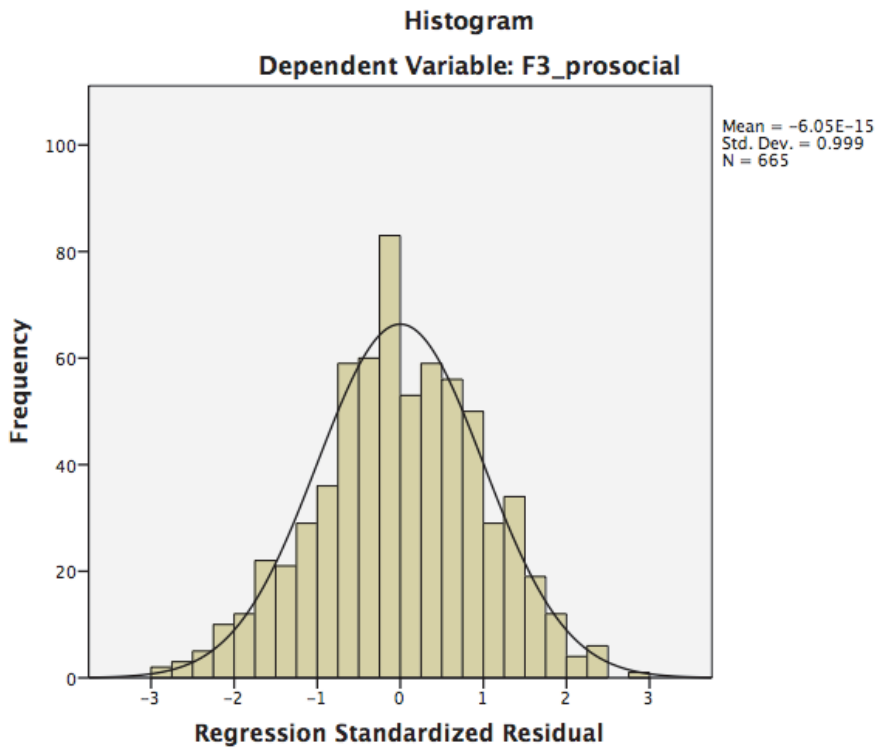


Figure B4. Histogram of Factor 3 residuals

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**Models with Multiple goal scores predicting GPA.**

**Histogram**
**Dependent Variable: Zscore(GPA)**

Mean = 2.13E−15
Std. Dev. = 0.998
N = 655
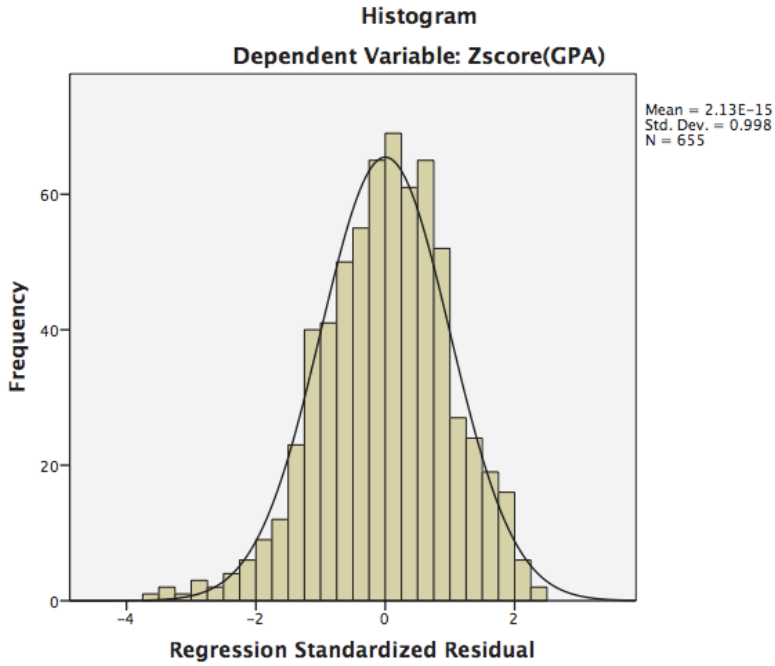
Figure B5. Histogram of GPA residuals

**Models with Inter-goal relations predicting GPA.**

**Histogram**
**Dependent Variable: Zscore(GPA)**

Mean = 6.11E−17
Std. Dev. = 0.998
N = 655
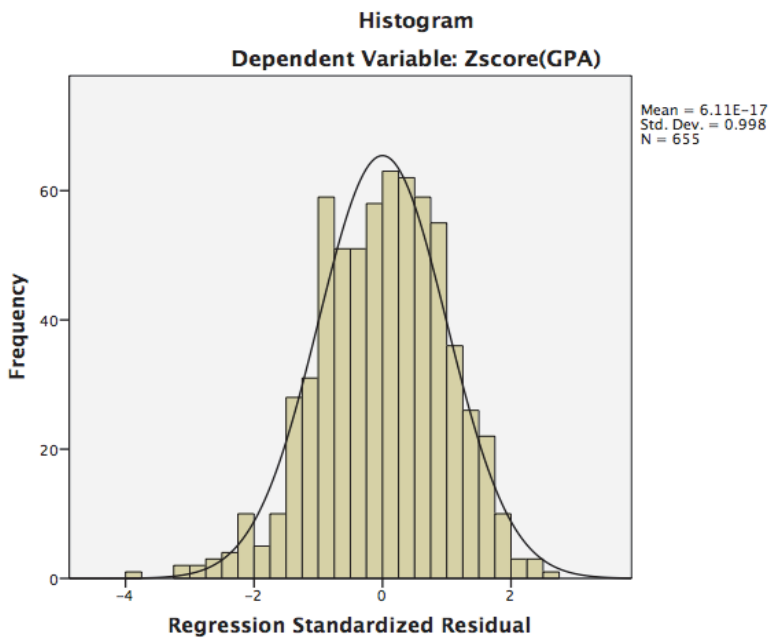
Figure B6. Histogram of GPA residuals

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**Additional Tables**

Table B1
*Correlations between all goals for total sample*

|  | Feel happy | Pay attention | Make friends | Learn new things | Cheer up a classmate who is sad | Be challenged | Have fun |
|---|---|---|---|---|---|---|---|
| Pay attention | .16** |  |  |  |  |  |  |
| Make friends | .32** | .08 |  |  |  |  |  |
| Learn new things | .18** | .43** | .16** |  |  |  |  |
| Cheer up | .22** | .19** | .20** | .23** |  |  |  |
| Be challenged | .20** | .29** | .18** | .32** | .20** |  |  |
| Have fun | .41** | .10* | .30** | .16** | .18** | .20** |  |
| Follow rules | .13** | .55** | .05 | .34** | .22** | .17** | .00 |
| Be popular | .12** | -.02 | .35** | .04 | .03 | .19** | .16** |
| Give Help | .23** | .36** | .21** | .33** | .47** | .32** | .18** |
| Feel relaxed | .38** | .20** | .16** | .15** | .08* | .13** | .23** |
| Share | .24** | .24** | .26** | .24** | .30** | .25** | .22** |
| Feel unique | .32** | .15** | .30** | .19** | .17** | .23** | .29** |
| Get good grades | .22** | .41** | .09* | .27** | .16** | .20** | .17** |
| Have good relationships | .32** | .15** | .39** | .15** | .25** | .23** | .31** |
| Listen to teacher | .13** | .60** | .07 | .39** | .23** | .22** | .00 |
| Make my own decisions | .04 | .10* | .18** | .08 | .05 | .05 | .13** |
| Feel confident about myself | .31** | .22** | .31** | .27** | .12** | .23** | .32** |

*Note: N= 665; ** p < 0.01 *, p < 0.05; goal names are abbreviated due to space limitations.*

Table B1

*Correlations between all goals for total sample*

| | Follow rules | Be popular | Give help to classmates | Feel relaxed | Share with classmates | Feel unique and special | Get good grades | Have good relationships | Listen to my teacher | Make my own decisions |
|---|---|---|---|---|---|---|---|---|---|---|
| Be popular | -.12** | | | | | | | | | |
| Give help | .32** | .07 | | | | | | | | |
| Feel relaxed | .18** | .09* | .20** | | | | | | | |
| Share | .24** | .13** | .46** | .25** | | | | | | |
| Feel unique and special | .11** | .27** | .22** | .26** | .22** | | | | | |
| Get good grades | .30** | .06 | .23** | .23** | .11** | .18** | | | | |
| Have good relationships | .17** | .21** | .20** | .15** | .30** | .26** | .22** | | | |
| Listen to my teacher | .67** | -.09* | .37** | .16** | .27** | .10* | .33** | .18** | | |
| Make my own decisions | .05 | .16** | .13** | .18** | .12** | .20** | .10* | .15** | .03 | |
| Feel Confident | .10* | .22** | .19** | .26** | .15** | .36** | .19** | .25** | .12** | .23** |

*Note: N= 665; ** p < 0.01, * p < 0.05; goal names are abbreviated due to space limitations.*

Table B1

*Correlations Between Self-regulation, Interference, Facilitation, GPA and Goals*

| | Self-regulation efficacy | Interference | Facilitation | GPA |
|---|---|---|---|---|
| Feel happy | .20** | -.01 | .12** | .10* |
| Pay attention | .49** | -.09* | .19** | .20** |
| Make friends | .13** | .06 | .09* | -.02 |
| Learn new things | .42** | -.01 | .18** | .08* |
| Cheer up a classmate | .20** | -.09* | .06 | .10** |
| Be challenged | .31** | -.01 | .16** | .15** |
| Feel relaxed | .22** | .00 | .05 | .04 |
| Share with classmates | .31** | .06 | .05 | .02 |
| Feel unique and special | .21** | -.03 | .10** | .08* |
| Get good grades | .37** | -.06 | .19** | .44** |
| Have good relationships | .17** | -.09* | .12** | .16** |
| Listen to my teacher | .44** | .02 | .18** | .16** |
| Make my own decisions | 0.07 | -.01 | .04 | .00 |
| Feel Confident | .30** | .01 | .15** | .10* |

*Note: N= 655; ** p < 0.01 *, p < 0.05.*

Table B2

*School 1: Correlations Between Self-regulation Efficacy, Inter-goal relations, GPA and Control Variables*

| | GPA | Self-regulation efficacy | Interfere | Facilitate | Gender | Grade |
|---|---|---|---|---|---|---|
| Self-regulation efficacy | .56** | | | | | |
| Interfere | -.33** | -.17* | | | | |
| Facilitate | .37** | .32** | -.47** | | | |
| Gender | .25** | .20** | -.08 | .10 | | |
| Grade | -.21** | .04 | .09 | .05 | .08 | |
| Race | -.04 | -.02 | .02 | .07 | -.02 | .01 |

*Note: N=171* for correlations with GPA and *N= 183* for all other correlations; *$* p < 0.05$, $** p < 0.01$*

Table B2

*School 1: Correlations Between all Goals*

|  | Feel happy | Pay attention | Make friends | Learn new things | Cheer | Be challenged | Have fun | Follow rules |
|---|---|---|---|---|---|---|---|---|
| Pay attention | .11 | | | | | | | |
| Make friends | .28** | .27** | | | | | | |
| Learn new things | .10 | .50** | .30** | | | | | |
| Cheer up a classmate | .21** | .24** | .21** | .17* | | | | |
| Be challenged | .16* | .36** | .23** | .47** | .26** | | | |
| Have fun | .43** | .07 | .23** | .17* | .11 | .25** | | |
| Follow rules | .22** | .58** | .17* | .45** | .18* | .22** | -.01 | |
| Be popular | .03 | -.05 | .42** | .14 | .06 | .18* | .10 | -.09 |
| Give help to classmate | .35** | .53** | .32** | .33** | .53** | .37** | .17* | .43** |
| Feel relaxed | .40** | .23** | .11 | .25** | .02 | .16* | .27** | .22** |
| Share with my classmates | .35** | .33** | .30** | .29** | .38** | .35** | .22** | .26** |
| Feel unique and special | .29** | .23** | .37** | .25** | .14 | .27** | .32** | .15* |
| Get good grades | .23** | .36** | .07 | .31** | .01 | .24** | .13 | .31** |
| Have good relationships | .24** | .25** | .44** | .27** | .25** | .34** | .32** | .20** |
| Listen to my teacher | .12 | .68** | .01 | .54** | .22** | .30** | .00 | .69** |
| Make my own decisions | .05 | .08 | .19* | .12 | .14 | .09 | .14 | .15* |
| Feel confident about myself | .33** | .21** | .41** | .30** | .18* | .23** | .25** | .20** |

*Note: N =183; ** p < 0.01, * p < 0.05; goal names are abbreviated due to space limitations.*

Table B2
*School 1: Correlations between all goals continued*

| | Be popular | Give help | Feel relaxed | Share | Unique and special | Get good grades | Have good relations | Listen to my teacher | Make my own decisions |
|---|---|---|---|---|---|---|---|---|---|
| Give help | .02 | | | | | | | | |
| Feel relaxed | .08 | .21** | | | | | | | |
| Share | .11 | .59** | .27** | | | | | | |
| Feel unique and special | .25** | .35** | .38** | .27** | | | | | |
| Get good grades | .02 | .24** | .26** | .08 | .21** | | | | |
| Have good relationships | .24** | .29** | .20** | .35** | .31** | .16* | | | |
| Listen to my teacher | -.12 | .44** | .19** | .31** | .18* | .33** | .18* | | |
| Make my own decisions | .09 | .12 | .22** | .09 | .34** | .01 | .18* | .04 | |
| Feel confident about myself | .35** | .37** | .36** | .22** | .60** | .19** | .37** | .24** | .24** |

*Note: N =183; ** p < 0.01, * p < 0.05;* goals are abbreviated due to space limitations.

Table B2

*School 1: Regression Coefficients for Self-regulation Efficacy and Inter-goal relations Regressed on GPA*

|  | B | SE | $\beta$ |
|---|---|---|---|
| Constant | 1.61** | .29 | |
| Self-regulation efficacy | .07** | .01 | .46 |
| Interference | -.02* | .01 | -.15 |
| Facilitation | .04* | .02 | .14 |
| Gender | .21** | .10 | .15 |
| Grade | -.34** | .09 | -.22 |
| Race | -.03 | .04 | -.04 |
| $R^2$ | | .44** | |

*Note: N =171; * p < 0.05, ** p < 0.01.*

Table B3

*School 2: Correlations Between Self-regulation efficacy, Inter-goal relations, GPA and Control Variables*

| | GPA | Self-regulation efficacy | Interfere | Facilitate | Gender | Grade |
|---|---|---|---|---|---|---|
| Self-regulation efficacy | .43** | | | | | |
| Interfere | -.30** | -.07 | | | | |
| Facilitate | .18** | .27** | -.06 | | | |
| Gender | .21** | .01 | -.06 | .08 | | |
| Grade | .15** | -.05 | -.06 | .01 | -.03 | |
| Race | .07 | .08 | .02 | -.03 | -.02 | .06 |

*Note: N =482; ** p < 0.01.*

Table B3
*School 2: Correlations Between all Goals*

|  | Feel happy | Pay attention | Make friends | Learn new things | Cheer up classmate | Be challenged | Have fun | Follow rules | Be popular | Give help to classmates |
|---|---|---|---|---|---|---|---|---|---|---|
| Pay attention | .19** |  |  |  |  |  |  |  |  |  |
| Make friends | .33** | .01 |  |  |  |  |  |  |  |  |
| Learn new things | .22** | .36** | .09* |  |  |  |  |  |  |  |
| Cheer up | .21** | .16** | .19** | .22** |  |  |  |  |  |  |
| Be challenged | .19** | .26** | .16** | .26** | .20** |  |  |  |  |  |
| Have fun | .39** | .07 | .31** | .14** | .20** | .13** |  |  |  |  |
| Follow rules | .11* | .55** | .01 | .30** | .21** | .17** | .01 |  |  |  |
| Be popular | .15** | -.02 | .31** | .00 | .03 | .17** | .15** | -.12** |  |  |
| Give help | .20** | .28** | .17** | .30** | .44** | .31** | .18** | .27** | .08 |  |
| Feel relaxed | .40** | .20** | .19** | .12** | .10* | .13** | .24** | .16** | .09* | .20** |

*Note: N =482;  ** p < 0.01,  * p < 0.05;* goal names are abbreviated due to space limitations and are continued on the next page.

Table B3. School 2: Correlations between all goals continued

| | Feel relaxed | Share with classmates | Feel unique and special | Get good grades | Have good relationships | Listen to my teacher | Make my own decisions |
|---|---|---|---|---|---|---|---|
| Share | .26** | | | | | | |
| Feel unique and special | .24** | .22** | | | | | |
| Get good grades | .23** | .12** | .19** | | | | |
| Have good relationships | .16** | .26** | .23** | .26** | | | |
| Listen to my teacher | .16** | .25** | .07 | .33** | .16** | | |
| Make my own decisions | .15** | .13** | .15** | .13** | .13** | .03 | |
| Feel confident about myself | .24** | .08 | .30** | .21** | .20** | .09* | .22** |

*Note: N =482; ** p < 0.01, * p < 0.05; goal names are abbreviated due to space limitations.*

Table B3
 School 2: *Regression Coefficients for Self-regulation Efficacy and Inter-goal relations Regressed on GPA*

|  | B | SE | $\beta$ |  |
| --- | --- | --- | --- | --- |
| Constant | 1.51* | .14 |  |  |
| Self-regulation efficacy | .05* | .01 | .40 |  |
| Interference | -.03* | .00 | -.30 |  |
| Facilitation | .01 | .01 | .05 |  |
| Gender | .20* | .04 | .17 |  |
| Grade | .11* | .03 | .15 |  |
| Race | .02 | .02 | .04 |  |
| $R^2$ |  |  |  |  |
|  |  | .32* |  |  |

*Note: N =482; * p < 0.01.*


Table B4
 *Reliabilities of Self-regulation Efficacy and Inter-goal relations sub-scales*

| Scale name | Cronbach's Alpha | *N* |
| --- | --- | --- |
| Interference | 0.82 | 6 |
| Facilitation | 0.76 | 2 |
| Self–regulation efficacy | 0.79 | 7 |

*Note: N=665; Tabulated N's represent number of items in each scale.*

Table B5

*First Factor Analysis Pattern Matrix Loadings: All 18 Goals*

| | F1 | F2 | F3 | F4 |
|---|---|---|---|---|
| Learn new things | **0.42** | | 0.14 | -0.15 |
| Pay attention | **0.74** | | | |
| Follow rules | **0.76** | | -0.16 | |
| Listen to my teacher | **0.80** | | -0.13 | -0.11 |
| Get good grades | **0.43** | 0.13 | 0.11 | |
| Feel happy | | **0.93** | -0.17 | |
| Have fun | -0.10 | **0.39** | 0.23 | -0.11 |
| Feel relaxed with no stress | 0.16 | **0.37** | | |
| Make friends | | 0.19 | **0.40** | -0.17 |
| Be challenged | 0.16 | | **0.23** | -0.23 |
| Have good relationships with my friends | | 0.20 | **0.26** | -0.17 |
| Feel unique and special | | 0.22 | **0.39** | |
| Make my own decisions and choices | | | **0.39** | |
| Feel confident about myself | 0.15 | 0.21 | **0.45** | |
| Share with my classmates | | | | **-0.52** |
| Give help to my classmates | 0.11 | | | **-0.73** |
| Cheer up a classmate who is sad | | | | **-0.63** |

*Note:* $N$ = 665. Maximum Likelihood extraction with an oblimin rotation (11 iterations). KMO = .86, $x^2$ (153) = 2993.01, $p$ <.001.

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Table B6

*Second Factor Analysis Pattern Matrix Loadings: Goals below .40 removed.*

|  | F1 | F2 | F3 | F4 |
|---|---|---|---|---|
| Feel happy | **1.03** |  | -0.14 |  |
| Feel relaxed with no stress | **0.30** | 0.18 | 0.17 |  |
| Pay attention |  | **0.73** |  |  |
| Learn new things |  | **0.42** | 0.15 | -0.14 |
| Follow rules |  | **0.76** | -0.16 |  |
| Get good grades |  | **0.44** | 0.13 |  |
| Listen to my teacher |  | **0.80** | -0.15 | -0.11 |
| Feel confident about myself | 0.15 | **0.17** | 0.52 |  |
| Cheer up a classmate who is sad |  |  |  | -0.61 |
| Have fun | **0.30** |  | **0.30** | -0.12 |
| Make friends | 0.16 |  | **0.40** | -0.17 |
| Be part of a popular group |  | -0.15 | **0.49** |  |
| Feel unique and special | 0.16 |  | **0.45** |  |
| Make my own decisions and choices |  |  | **0.40** |  |
| Share with my classmates |  |  |  | **-0.51** |
| Give help to my classmates |  |  |  | **-0.75** |

*Note:* $N = 665$. This factor analysis excluded the goals of "Be challenged" and "Have good relationships with friends" Maximum Likelihood extraction with an Oblimin rotation (7 iterations).
KMO = .84, $x^2 (120) = 2612.63$, $p < .001$.

Table B7
*Third Factor Analysis Pattern Matrix Loadings: "Have fun" and "Feel relaxed with no stress" removed.*

|  | F1 | F2 | F3 |
|---|---|---|---|
| Pay attention | **0.73** | | |
| Learn new things | **0.42** | 0.16 | -0.12 |
| Follow rules | **0.77** | -0.14 | |
| Get good grades | **0.44** | 0.18 | |
| Listen to my teacher | **0.80** | -0.15 | -0.10 |
| Make friends | | **0.52** | -0.15 |
| Feel happy | | **0.41** | -0.14 |
| Be part of a popular group | -0.17 | **0.50** | |
| Feel unique and special | | **0.55** | |
| Make my own decisions and choices | | **0.31** | |
| Feel confident about myself | 0.16 | **0.60** | |
| Give help to my classmates | | | **-0.75** |
| Share with my classmates | | | **-0.52** |
| Cheer up a classmate who is sad | | | **-0.60** |

*Note: N* = 665. This factor analysis excluded the goals of "Have fun" and "Feel relaxed with no stress". Maximum Likelihood extraction with an Oblimin rotation (5 iterations). KMO = .83, $x^2$ (91) = 2235.77, *p* <.001.