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UNIVERSITY OF CALIFORNIA,  
IRVINE

College Students' Academic Motivation:  
Influence and Composition of Social Support from Parents, Peers, and Others

DISSERTATION

submitted in partial satisfaction of the requirements  
for the degree of

DOCTOR OF PHILOSOPHY

In Psychological Science

by

Yongwon Cho

Dissertation Committee:  
Professor Jutta Heckhausen, Chair  
Professor Chuansheng Chen  
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2023



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## VITA

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#### EDUCATION

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#### PEER-REVIEWED PUBLICATIONS

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- Cho, Y.**, Hamm, J. M., Heckhausen, J., & Cramer, S. C. (2023). Downward adjustment of rehabilitation goals may facilitate post-stroke arm motor recovery. *Psychology & Health*, 1-17. <https://doi.org/10.1080/08870446.2023.2211991>
- Yau, P. S., **Cho, Y.**, Shane, J., Kay, J., & Heckhausen, J. (2022). The effect of motive-goal congruence on adolescents' academic goal engagement and disengagement. *Motivation and Emotion*, 46(4), 447-460. <https://doi.org/10.1007/s11031-022-09946-1>
- Cho, Y.**, Hamm, J. M., Heckhausen, J., & Cramer, S. C. (2022). The role of goal adjustment during rehabilitation from stroke. *Applied Psychology: Health and Well-Being*, 14(1), 26-43. <https://doi.org/10.1080/08870446.2023.2211991>
- Yau, P. S., **Cho, Y.**, Shane, J., Kay, J., & Heckhausen, J. (2021). Parenting and adolescents' academic achievement: the mediating role of goal engagement and disengagement. *Journal of Child and Family Studies*, 31(4), 897-909. <https://doi.org/10.1007/s10826-021-02007-0>

## CONFERENCE PRESENTATIONS

---

**Cho, Y.**, Hamm, J. M., Heckhausen, J., & Cramer, S. C. (2022, October 23-25) *The benefits of adjustments in rehabilitation goals among stroke patients*. [Conference presentation]. Society for Longitudinal and Lifecourse Studies, Cleveland, OH, USA.

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**Cho., Y.**, Keyserlingk, L., & Heckhausen, J. (2022, May 26-29) *Goal Adjustment capacities mitigate college students' psychological distress during the COVID-19 pandemic*. [Conference presentation]. Association for Psychological Science, Chicago, IL, USA.

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**Cho, Y.**, Heckhausen, J., & Cramer, S. C. (2020, January 25) *Motivation regulation through realistic goal adjustment during stroke rehabilitation*. [Conference presentation]. Western Positive Psychology Association, Claremont, CA., USA.

**Cho, Y.**, Heckhausen, J., & Cramer, S. C. (2019, November 1) *The role of goal disengagement and adjustment during gamified stroke rehabilitation in older adults*. [Poster presentation]. University of California Irvine School of Social Ecology Poster Session, Irvine, CA, USA.

**Cho, Y.**, Heckhausen, J., & Cramer, S. C. (2019, October 11-13) *The role of goal disengagement and adjustment during gamified stroke rehabilitation in older adults*. [Conference presentation]. Society for the Study of Human Development, Portland. OR, USA.

**Cho, Y.**, Heckhausen, J., & Cramer, S. C. (2019, May 6) *The role of goal disengagement and during gamified stroke rehabilitation*. [Conference presentation]. University of California Irvine Department of Psychological Science Colloquium, Irvine, CA, USA.

**Cho, Y.**, Ochakovskaya, Y., & Mangels, J. (2016, April 2) *Learning from failure: The role of confidence in error based learning examined*. [Poster presentation]. New York University Master's Research Conference, New York, NY, USA.

Chang, S., Kim, H., **Cho, Y.**, Hong, Y., Yoon, J., Yoon, H., Onur, S., & Cho., Y. S. (2014, August 28-30) *Referent tone modulates horizontal SMARC effect: Evidence for referential coding*. [Poster presentation]. Korean Psychology Association, Seoul, South Korea.

## AWARDS

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<b>Graduate Student Mentoring Award (\$200)</b> University of California, Irvine, School of Social Ecology. Awarded to graduate students for excellent mentorship of undergraduate students each year.	2021
<b>Division of Teaching Excellence and Innovation Pedagogical Fellowship (\$5000)</b> University of California, Irvine, Division of Teaching Excellence and Innovation. Awarded to graduate students who were selected as part of the UCI annual Pedagogical Fellowship program and worked with faculty to develop high quality remote courses as well as receiving pedagogical trainings.	2020
<b>Certificate in Remote Instruction</b> University of California, Irvine, Division of Teaching Excellence and Innovation. Awarded In recognition of training in evidence-based pedagogy.	2020
<b>Benchmark Award (\$3700)</b> University of California, Irvine, Department of Psychological Science. Awarded to graduate students whose continuing success in the graduate program is recognized.	2020
<b>Alison Clarke-Stewart Excellence Award (\$500)</b> University of California, Irvine, Department of Psychological Science. Awarded to a paper that is creative, original, theoretically and practically strong, and reflects a large amount of independent work by the student.	2019
<b>Master's Research Conference Award (\$100)</b> New York University, Department of Psychology. Awarded to a graduate student who demonstrated excellence of their work in NYU Annual MA Psychology Research Conference.	2016

## **ABSTRACT OF THE DISSERTATION**

College Students' Academic Motivation:  
Influence and Composition of Social Support from Parents, Peers, and Others

by  
Yongwon Cho

Doctor of Philosophy in Psychological Science

University of California, Irvine, 2023

Professor Jutta Heckhausen, Chair

This dissertation project explores the role of socialization agents in fostering motivational self-regulation among college students pursuing challenging academic goals. The transition to college represents a critical period in the lives of young adults, wherein they must navigate new to achieve their educational aspirations Understanding factors influencing students' adaptability to academic setbacks is vital for enhancing college retention rates and supporting their pursuit of higher education. The literature on motivation and developmental theory has shown that experiences of failures to meet over-ambitious aspiration levels should prompt adjustments of goals to enable a meaningful continuation of goal pursuit (Heckhausen et al., 2019). Building on this foundation, this project strives to deepen the comprehension of the motivational self-regulation process by exploring how college students enact such regulation and delving into the intricate interplay of parental, peer, and faculty support in this context.

Study 1 draws upon a diverse sample of 373 college students from longitudinal data from the Los Angeles Unified School District Study (LAUSD), which examines the transition of youth to post-secondary education or the workforce. The study focuses on changes in parental support

during the transition from high school to college. The study reveals that while informational support from parents remains relatively stable, emotional support decreases, and this decrease is associated with lower academic motivation among college students. Study 2 utilizes data from the Measurement of Undergraduate Success Trajectories (MUST) project at the University of California, Irvine (UCI). This study examines the process of self-regulation for challenging academic goals and the functions of informational and emotional social support from peers and faculty members by using a sample of 323 undergraduate students. The results demonstrate that goal adjustment is positively associated with academic motivation, and informational support from peers and faculty members plays a significant role in facilitating this process. Study 3 delves into the potential interaction between parental support and social support within the college environment in sustaining academic motivation. Data for this study were obtained through the UCI MUST project, using a sample of 584 undergraduate students. The findings underscore the essential role of parental emotional support in sustaining academic motivation when students encounter limited social support in college.

Through these three studies, this dissertation project contributes valuable insights into the complex relationships between social support, motivational self-regulation, and academic success among college students. Ultimately, this research enriches the understanding of the complexities of social support in educational settings and its profound impact on students' academic motivation, well-being, and long-term success.

## **Chapter 1: Introduction**

Striving for a long-term developmental goal, such as earning a college degree, requires sophisticated motivational self-regulation to maintain goal engagement. During this process, experiences of failures to meet over-ambitious aspiration levels should prompt adjustments of goals to enable a meaningful continuation of goal pursuit. Developmentally, such motivational self-regulation emerges early in life in interactions with parents and other important socialization agents. However, it is lesser known whether parents and other major socialization agents still play this prominent role during the college years. This multi-study dissertation project will examine the role of major socialization agents in the development and use of motivational self-regulation by addressing the following research questions: How independent do students become from parental support when they transition into college? Does the decrease of parental support negatively influence the students' academic motivation? What are the roles of other sources of social support within the college environment in guiding and encouraging adaptive motivational self-regulation to maintain academic motivation for difficult academic goals? Can the social support available in the college environment help students sustain or reactivate academic motivation? Lastly, when college students encounter difficulties in accessing social support within the college setting, thereby struggling with motivational self-regulation for challenging academic goals, can parental support serve a compensatory function?

According to the National Center for Education Statistics (Hussar et al., 2020), the immediate college enrollment rate among US high school graduates has significantly increased from 63% to 70% in the past two decades. Despite this increase in intention to complete postsecondary education, college graduation rates within six years of entrance have continued to stay only around 59-60% since 2010 across various socio-economic status levels and ethnicities.



In other words, nearly 40% of the high school students who had aspired to attain postsecondary degrees abandoned their educational goals. These students gave up their goals to earn a college degree when they encountered difficulties, failures, and setbacks. This is not a trend to be overlooked, considering that educational attainments have been reported to predict life-long benefits in terms of subjective well-being and physical health prospective regardless of income (del Mar Salinas-Jiménez et al., 2011; Meeks & Murrell, 2001). Thus, it is important to understand the constructs that may affect college students' ability to overcome difficulties in their studies, either positively or negatively.

One of the major factors known to facilitate college students' motivation to continue the pursuit of their education goals is social connectedness (Allen et al., 2008). The more the college students feel socially integrated into the institution (e.g., with peers, faculty members, or college academic counselors), the more they demonstrate competence in protecting their academic motivation against discouraging experiences, such as receiving a low grade point average (GPA) (Clark et al., 2014). Unfortunately, due to the unique challenges that accompany the transition from high school to college, strong social support from college environments is not always guaranteed. An abrupt increase in autonomy during this period occasionally implies becoming disconnected with the previous social support from family, whereas establishing a new network of supportive relationships in a novel environment can be challenging. When these challenges result in a lack of social support, this may substantially undermine the students' capacity to maintain academic motivation.

This research plans to explore the association between social support provided after transitioning to college and students' ability to protect academic motivation, especially when discouraging experiences occur. To reveal the processes at the interface of social support and the

self-regulation of academic motivation, the theoretical framework of the Motivational Theory of Lifespan Development (MTD) was applied (Heckhausen & Schulz, 1995; Heckhausen et al., 2010; Heckhausen et al., 2019). According to MTD, and convergent with previous research on aspiration levels in achievement motivation (see review in Brunstein & Heckhausen, 2018), when goal pursuit becomes extremely difficult, an effective strategy to protect motivational resources is to adjust the aspiration to a more achievable level and to pursue the adjusted goal.

The first aim of this research is to examine whether the social support from parents, peers, or faculty members affects academic motivation among college students. The second aim of this research is to examine whether a greater use of goal adjustment strategies is associated with higher academic motivation for challenging academic goals. The third aim of the research is to examine how the use of goal adjustment strategies is related to social support variables. More specifically, the current project examines whether the influence of social support on goal adjustment differs depending on the source of support (i.e., parents, peers, and faculty members) and the types of support (i.e., informational and emotional). Thereby, the influence of social support on academic motivation via goal adjustment will be examined as well.

To summarize, the following research questions are investigated: (1) Does leaving parents for college result in a decrease in parents' support (i.e., emotional and informational)? (2) Do the changes in parental support (i.e., emotional and informational) that occur between high school and college predict students' academic motivation in college? (3) When college students receive disappointing performance feedback, does goal adjustment help them maintain their academic motivation? (4) Does social support (i.e., emotional and informational) attained within the college context (i.e., peers and faculty members) help college students adjust their academic goals and protect academic motivation against the lower-than-expected performance feedback?

(5) Does social support (i.e., emotional and informational) from parents help college students adjust their academic goals and protect academic motivation against the lower-than-expected performance feedback? (6) When college students are in need of adjusting goal to maintain academic motivation but are lacking support within college context to help them adjust goal, does parental support serve a compensatory function?

## Theoretical Background of Goal Pursuit Behavior

### 1. Individual Agency in Goal Pursuit

**Individual as an active agent in goal pursuit.** Throughout life, individuals actively select and pursue goals as an active agent. The selection and pursuit of goals are not just a reflection of environmental pressures. Individuals proactively choose their own goals and apply various behavioral strategies to accomplish the goals (Lerner & Busch-Rossnagel, 1981; Brandtstädter & Lerner, 1999). Furthermore, as people confront changes in opportunities or constraints in their goal pursuits, they decide to alter their goals or strategies to maximize the utility of their motivational resources and to optimize the effectiveness of their actions (Brandtstädter & Lerner, 1999; Heckhausen et al., 2010). In lifespan developmental research, there are three major approaches to explain the role of individuals in conducting self-regulation with their developmental goals throughout the course of life. These three related but distinct approaches are the dual-process model proposed by Brandtstädter (1989, 2009), the selection, optimization, and compensation (SOC) model proposed by Baltes and colleagues (Baltes, 1987, 1997; Baltes & Baltes, 1990), and the motivational theory of lifespan development proposed by Heckhausen and colleagues (2010). After introducing these approaches, it will be discussed how the motivational theory of lifespan development provides the most suitable theoretical framework for this dissertation project.

**Dual-process model.** One of the three major approaches that explain individual agency in goal pursuit is Brandtstädter's (1989; 2009) dual-process model. According to Brandtstädter (1989), individuals' tendency to maintain self-consistency over the life span is the fundamental force that propels the self-regulatory processes to attain goals. When individuals perceive discrepancy between an actual state of the self and a desired state of self, this self-inconstancy

results in emotional distress. Therefore, there takes place a need to reduce this distress by minimizing the difference between the actual state of self and the desired state of self through the self-regulatory processes categorized into assimilation and accommodation.

Where the attainability of a goal is high due to the abundance of opportunities, support, and motivational resources, it is an effective strategy when an individual deliberately increases mental and behavioral effort to actively influence the environment. By doing so, the environment may change to be closer to the desired state. This strategy is referred to as assimilation. On the other hand, some goals are difficult to be achieved because the required recourses are scarce. In these cases, the accommodation strategy of changing the subjective value on goal status may help close the perceived gap between the actual and the desired goal state. For example, individuals may devalue a goal when accomplishing it becomes challenging or overvalue the actual state when there are not enough action means to improve it.

Under the premise of striving to decrease the difference between the present state and the aspired outcome, individuals make judgements on goal attainability while pursuing goals and actively choose which strategy to use. Due to the opposing characteristics of circumstances where assimilation and accommodation are beneficial, the application of two strategies is observed to appear in an antagonistic manner (Brandtstädter & Rothermund, 2002).

**Selection, optimization, and compensation model.** While the dual-process model explains the guiding force that makes an individual choose goal pursuit strategies, Baltes and colleagues' selection, optimization, and compensation (SOC) model proposes the principle of individuals' goal selection, goal pursuit, and goal maintenance in regards of their developmental goals (Freund & Baltes, 2002). Throughout the course of life, time and motivational resources are limited by nature. Thus, there is a constant need for strategic decision making in managing

the hierarchy of goals in a way that the expected loss may be minimized, and the gain from invested efforts can be maximized.

Individuals may choose important goals worth pursuing based on the judgment of expected gain (selection) at the moment, may engage in the selected goal through directing time, effort, and resources (optimization), and may recruit additional action means or resources when the expected attainability declines due to setbacks (compensation). Lastly, when functional loss that substantially undermines goal pursuit takes place, individuals can modify the goal hierarchies and can redistribute their resources to a new important goal.

## **2. Motivational Theory of Lifespan Development**

**Life-span theory of control.** In the life-span theory of control (later developed to motivational theory of lifespan development, MTD), Heckhausen and Schulz (1995) have proposed that individuals strive to maximize the control they have on their environment across their lifespan. Strategies of control can be classified into primary control (i.e., controlling and changing the external world) and secondary control (i.e., controlling and changing internal representations of goals, emotions, and appraisals of goal strivings) (Rothbaum et al., 1982). Individuals' ability to exert primary control increases drastically from infancy to midlife as they become more capable of influencing their environments. Afterwards, as constraints in one's biology and resources increase after midlife, primary control potential gradually decreases, and secondary control steadily increases. Although the distinction between primary control and secondary control is similar to the distinction between the assimilation and the association of the dual-process mode, the two control strategies are not mutually exclusive. Conversely, the orchestration of both strategies can occur simultaneously to achieve the common purpose of

maximizing one's primary control striving across domains of functioning and the life course (Heckhausen et al., 2010).

**Model of optimization in primary and secondary control.** In addition, Heckhausen (1999) proposed in the model of optimization in primary and secondary control that individuals either engage with or disengage from a goal depending on the cost or availability of accomplishing it. When individuals select goals to pursue (selection), they consider a set of factors, including goal attainability, the long-term consequences of investing in the goal (including the loss from unselected goals), and the diversity of goals. When a failure or loss is experienced, individuals may seek means to overcome shortfalls or may adjust their perception of the goal to minimize psychological distress from the loss (compensation). Through the coordination of selective and compensatory strategies, individuals can adaptively optimize their life course development in real-time to the constantly changing climate of motivational resources.

In sum, by activating the control strategies of selective primary control, selective secondary control, compensatory primary control, or compensatory secondary control, individuals pursue and disengage from goals across the life span. These control strategies can be executed jointly for one goal, and whether they are applied adaptively depends on the degree to which the goals pursued at a given time reflect the opportunities and constraints in the given developmental and social ecology (Heckhausen et al., 2010; 2019).

**Motivational theory of lifespan development.** Integrating the life-span theory of control and the model of optimization in primary and secondary control, Heckhausen et al. (2010) presented the motivational theory of lifespan development (MTD). MTD, as a comprehensive framework on individual agency, conceptualizes the life course as a time-extended field of action

during which a sequence of action cycles unfolds. Each cycle begins by selecting a goal and ends with achieving (or disengaging from) the goal, which then leads into a new cycle of engagement with an adjusted goal or a goal in a different domain.

Once a goal is chosen, the goal engagement process involving selective primary control (SPC) and selective secondary control (SSC) is activated for the selected goal. SPC involves maintaining behavioral persistence in investing time, energy, and skills. SSC includes self-regulation strategies of shielding motivational commitment by enhancing the perceived value of the goal, reminding of the attainability, or screening out the desire of pursuing other goals. These two strategies make the most sense in the early phase of the goal pursuit cycle when there are still many opportunities. However, over time, opportunities decrease. Therefore, an extra amount of effort is required to compensate for the loss of goal attainability. In this case, while SPC and SSC are bolstered, the compensatory primary control (CPC) strategy of recruiting additional support from others or mobilizing unusual action means of goal pursuit is used to maximize the investment.

In cases in which the outcomes are controllable by the individuals, the more frequent use of SPC strategies has been observed to predict a greater probability of achieving goals (Shane & Heckhausen, 2012). When the goal pursuit is moderately challenging, it has been observed that the more frequent use of the SSC strategy can predict the more frequent use of both SCP and CPC, which are associated with attaining difficult goals (Hamm et al., 2013; Poulin & Heckhausen, 2007).

**Individual agency in difficult goal pursuit.** Occasionally, during goal pursuit, the opportunities can become depleted, making the goal unattainable or the pursuit of it excessively costly. The initial goal setting may have been overly ambitious, adverse life events or age-



normative changes may have cost motivational resources, and other goal(s) may have become more prioritized in terms of urgency (Brandtstädter & Renner, 1990; Heckhausen et al., 2010; Wrosch et al., 2003; Schulz & Heckhausen, 1996). According to MTD, when one or more of these setbacks exist, compensatory secondary control (CSC) strategies of disengaging from the goal are required. Withdrawing motivational commitment could be particularly helpful in this case because adhering to the goal may result in the waste of motivational resources on futile actions. These are the resources that could have been invested into other more productive and effective behaviors (Heckhausen & Schulz, 1993; Wrosch, et al., 2003). If an individual can successfully disengage from a failing goal, the individual can use the saved motivational resources to foster motivational commitment to another goal and to activate a new cycle of engagement with it (Heckhausen et al., 2010). In sum, a successful regulation of motivation for an extremely difficult goal requires the ability to disengage from overly ambitious goals and to reengage with a new, realistic goal.

In addition, one can minimize the psychological distress from the failure by using the compensatory secondary control strategy of self-protection. For example, to prevent psychological distress from loss and disengagement, it is helpful to devalue the goal, overvalue other goals, or remind oneself that other people are in similar (or worse) situations.

The ability to adjust the goal by disengaging and reengaging has been referred to as goal adjustment capacities and has been shown to provide a number of benefits (Wrosch & Scheier, 2020). It has been reported that higher goal adjustment capacities predict a lower level of psychological distress and less depressive symptoms (Wrosch et al., 2007). In the long-term, people with higher goal adjustment capacities are known to experience general benefits in their

physical and mental health, likely due to their flexibility to reallocate time and energy adaptively to the changing status of goals (Wrosch et al., 2013).

**Application of MTD in the proposed research.** Among the three theoretical frameworks on individual agency in goal pursuit, MTD provides an in-depth conceptualization of the processes involved when individuals respond to setbacks in their goal pursuit, which is the central theme of this dissertation project. In particular, it lays out the control strategies required when there is a shift to negative expectation about the attainability of a goal. Therefore, for the current research project, the theoretical framework of MTD and its action-phase model was used to conceptualize adaptive responses to failure experiences in a theoretical model of control strategies. The aim is to provide a conceptual model of how college students adaptively respond to an overambitious academic goal by adjusting the goals and thereby sustaining academic motivation, and how specific types and sources of social support can facilitate this.

### **3. What Makes Goal Adjustment Difficult?**

**Low stability of goal adjustment capacities.** Despite the benefit of having a high capability of goal adjustment, an individual's fluency in using the strategy is far from constant. Goal adjustment capacities show only a moderate degree of stability across the lifespan (Dunne et al., 2011). When compared to other personality constructs, such as the Big 5 factors, goal adjustment capacities are more subject to change across measurements at different times (Carver & Scheier 2014; Wrosch & Scheier, 2020). This suggests that goal adjustment capacities are more open to environmental influences, such as social support, and may vary more across situational settings that provide more or fewer opportunities for goal adjustment.

**Cognitive bias that hinders withdrawal of effort.** There can be hurdles in devaluing the original level of aspiration for several reasons. As described in MTD, once a goal is selected,

selective secondary processes are activated to enhance the perceived opportunity, perceived attainability, and perceived value of the goal to strengthen motivational commitment. These processes of selective secondary control are enhanced when individuals encounter difficulties in goal pursuit. They are helpful when the individual has a reasonable likelihood of success.

However, when failure experiences accumulate and the goal pursuit becomes futile, the individual must step out of the biased mode of SSCs, re-evaluate the feasibility of goal attainment, and potentially adjust the level of aspiration for the goal (see also the notion of “action crisis,” Brandstätter & Schuler, 2013).

Due to the nature of the biases involved in SSC, taking the step back and re-evaluating the situation can be challenging. In this case, being provided with guidance from another person who is not actively involved in biased cognitions about the current goal can be helpful. The benefit of social support in this respect is in the re-appraisal of the value of the previous unsustainable goal and setting a new alternate goal that is more attainable. In association with this need for goal reappraisal, it is empirically known that being in a depressive mood from repeated failure helps evaluate the goal more objectively (Brandstätter & Schuler, 2013). On the other hand, having a significant other to talk to is also found to help evaluate the goal progress realistically (Andrew & Thomson, 2009). This finding about the benefit of social support in helping realistic perception implies that social support can assist overcoming the cognitive bias that makes goal disengagement difficult. In this regard, it is expected that informational support from other people on goal appraisals can help assess the aspiration level, which in turn activates the goal disengagement process.

**Social pressure that hinders withdrawal of effort.** The social expectations present within a given context and at different stages of life contribute to the determination of goal

choices pursued by individuals (Hagestad, 1990; Neugarten, 1969). Difficulty may arise in detaching oneself from or revising a goal when others maintain exceedingly high expectations for its attainment, particularly among individuals who exhibit heightened sensitivity to social acceptance (Carver & Scheier, 1998, Scheier & Carver, 1981; Wrosch et al., 2003). Thus, it is postulated that perceiving a substantial level of social acceptance can facilitate goal adjustment when individuals recognize that their progress towards goals, which were previously imposed by societal norms, is unrealistically lofty.

**Emotional hurdle between disengagement and reengagement.** In the case of goal reengagement, an optimistic attitude and positive affect can catalyze motivational and behavioral investment in the adjusted goal (Haase et al., 2020). When individuals experience positive affect, satisfaction with life, and purpose in life, it was observed that their goal reengagement capacity increases subsequently. However, the influence of positive effect on goal reengagement was shown to be independent from goal disengagement. In contrast, goal disengagement is accompanied by sadness or depressive moods in most cases (Wrosch et al., 2003; Wrosch & Miller, 2009). Therefore, an effective emotional switch from a negative to a positive valence is required to activate a new commitment to the adjusted level of aspiration, which can be a challenging task depending on one's fluency with emotion regulation (Wrosch & Scheier, 2020). The expectation of the current research was that the benefit of social support for the receiver's affective regulation would lower the hurdle between goal disengagement and goal reengagement.

The level of emotional support that an individual perceives to receive within his or her social network positively predicts the level of optimism (Karademas, 2006). Further, showing a heightened level of optimism predicts a better capacity in coping with depressive mood and stress (Ian et al., 2002). Regarding the aspect of reactivating a goal engagement cycle with the

adjusted goal, Duke and colleagues (2002) found that optimism is associated with an individual's capacity to reengage with a substitute goal. In addition, Rasmussen and colleagues (2006) explained from their findings that a high level of optimism can lead to an easier goal adjustment because it helps people become more optimistic about their capacity in managing difficulties and creating a new purpose for the adjusted goal.

Combining these empirical findings, it can be hypothesized that emotional social support will facilitate optimistic mood, and it will in turn help individuals handle depressive emotion experienced after conducting goal disengagement. Moreover, it is expected that when emotional social support enhances individuals' optimistic thinking, they will become better at conducting goal reengagement.

These expected impacts of social support on individuals' goal adjustment capacities remains relatively unknown. Therefore, the present study seeks to advance the existing literature by studying the specific social support-related factors that exert influence on the process of goal adjustment. By contributing empirical evidence on this understudied aspect, the current research aims to enrich the field of motivational science and provide valuable insights into the mechanisms underlying successful goal adjustment processes.

## Social Support and Pursuit of Difficult Academic Goals

### 1. Buffering Functions of Social Support

Social support can be defined as an exchange of resources between two or more individuals intended to enhance the well-being of the recipient (Shumaker & Brownell, 1984). In other words, social support refers to specific supportive behaviors from people in an individual's social network that may assist the individual's functioning or may mitigate negative outcomes of adverse events (Malecki & Demaray, 2002).

**General benefits from social support.** Research on social support has provided ample evidence showing that being provided with a good quality and high quantity of social support in general is beneficial to subjective well-being and physical health (Berkman, 1984; House et al., 1988). Increased social support is related to lower mortality, faster recovery from illness, and increased ability to handle stressors (Sarason & Sarason, 2009). These benefits may include promoting resilience when hardships are experienced due to pursuing extremely difficult goals (Richman et al., 1998; Dumont & Provost, 1999).

### 2. Social Support and Difficult Goal Pursuit

In addition to these general benefits of having strong social support for an individual's well-being, developmental research has investigated the emergence and elaboration of compensatory secondary control strategies in the context of the family, and more specifically, the interactions with parents. In other words, it has been found parental support strongly influences the child's motivational self-regulation capacity when dealing with a challenging goal.

**Compensatory secondary control and social support in school years.** *Pre-school Years.* From age 5 to 12, children demonstrate their basic ability to behaviorally escape or mentally distract themselves from a stressful situation, which may be considered a foundation of

compensatory secondary control (Band & Weisz, 1988; Altshuler & Ruble, 1989; Vierhaus et al., 2007). In this period of life, parents' excessive expectations can lead to the child having a heightened level of fear of failure, which is associated with an inability to adjust to a realistic aspirational level and challenge when a setback is experienced (Heckhausen & Meyer, 1972; Kuhl & Völker, 1998). Therefore, it is crucial that parents support the child by assessing the competence accurately and providing appropriate goals (Heckhausen, 1987).

*School Entry.* School entry may expose a child to a new set of social interactions with school instructors. Learning goals are usually set based on social references (e.g., age) and are less tailored to an individual child's competence. Therefore, unless teachers support each child by setting individualized goals, children may become distracted or even prevented from setting realistic levels of aspirations for themselves (Heckhausen & Heckhausen, 2018; Lopez et al., 1998; Little et al., 1995). However, when parents can evaluate the child's competency independently from the institutional reference, they can help children modify and potentially lower unrealistically high aspiration levels prescribed by the teacher or at the very least can distract them from such unfeasible aspirations (Heckhausen & Schulz, 1995; Brandstädter, 2001).

*Adolescence.* Children become more independent from their parents as they become adolescents, but the parental influence on their response to struggles in educational achievement remains until late adolescence (Desforges & Abouchaar, 2003). For instance, a neglectful style of parenting is associated with adolescents having a high level of failure anxiety and attributing academic failure to one's own ability versus efforts, which may make them more likely to give up their goals and prevent them from reengaging with a new academic goal (Aunola et al., 2000).

To summarize, it seems that social support, particularly from parents, during the school years is indispensable for the development of children's ability to overcome challenges in goal pursuit, resulting in potentially more stable individual differences in the capacity to adjust goals or control strategies when required.

**Academic motivation and parental support in the early adulthood.** Specifics of the association between compensatory secondary control and parental support among college students are relatively unexplored. However, there are several empirical findings indicating that parental support considerably influences college students' academic motivation when challenges occur.

Some college students may become completely independent from their parents as they graduate from high school, but parental influence sometimes is observed to continue and to provide advantages in college students' goal achievement. When the shared agency of academic goal pursuit between parents and students is maintained yet autonomy is highly supported, students are more likely to be satisfied with their academic attainment even when they belong to a lower GPA group (Chang et al., 2010b). Moreover, another study on parenting and college students' academic motivation concluded that increasing parental involvement while avoiding the infringement of autonomy may help an academically demotivated student reengage with their studies (Kriegbaum et al., 2016).

**Academic motivation and social support within college context.** Within the college environment, actively seeking and engaging with social support can yield substantial benefits in the regulation of academic motivation. Students who perceive readily available support from faculty members demonstrate enhanced protection of their academic motivations compared to those who do not establish such interactions (Cokley, 2000; Komarraju & Musulkin, 2010).



Additionally, support from peer groups within the college context plays a vital role in fostering improved academic adjustment, particularly for students who may be at risk of lacking other forms of social support due to factors such as immigration status or demanding work conditions (Dennis et al., 2005; Whiteman et al., 2013).

These studies show that having strong social support either from continued involvement from parents or newly obtained sources in college may improve self-regulation with academic goals. Unfortunately, a more detailed investigation on the mechanism between social support subconstructs and the goal adjustment process involving goal disengagement and reengagement among college students is missing in the literature. Therefore, the aim of this research is to investigate college students' goal adjustment for difficult academic goals in-depth and ultimately to unravel the function of social support on the use of compensatory control strategies.

### **3. Multi-Dimensional Approach of Social Support**

**Multiple constructs of social support.** Due to the multidimensionality of the concept, researchers have used multiple definitions of social support depending on the aspect of social support they addressed (Veiel & Baumann, 1992). This lack of agreement in the conceptualization often led to many researchers having applied social support measures that do not distinguish between various sources, functions, and types of social support (Tardy, 1985; Hombrados-Mendieta et al., 2012). However, it is crucial to analyze the dimensions of social support separately because each component has its distinctive pattern and function in enhancing the receiver's well-being. To obtain a precise understanding of the mechanism of how social support influences an individual, it is essential to identify the elements that comprise social support and how they interact.

Gottlieb (1981) provided a categorization of the different levels of social support: macro, mezzo, and micro levels. The macro level refers to how much an individual is involved in the social exchange, the mezzo level refers to the structure of the support network, and the micro level refers to the quality of support given. Lin and colleagues (1986) provided a theoretical framework to distinguish between perceived versus actual social support. In their model, they categorized the types of social support into instrumental and expressive while emphasizing the importance of recognizing the difference between support received and subjective satisfaction from it. Laireiter and Baumann (1992) also developed a social support model to explain that a measurement of social support must consider different components of social support, such as where it takes place, actual vs. perceived support, and the degree of supportiveness in the network environment.

By integrating the previous works and providing a foundational framework of modern social measure scales, Tardy (1985) proposed one of the most comprehensive conceptualizations of social support. Tardy (1985) differentiated social support into four types: emotional (love, trust, empathy), informational (advice), instrumental (helping behaviors), and appraisal support (offering evaluative feedback). In the context of studying academic motivation and educational goal pursuit, Malecki, Demaray, and Elliott (2000) adopted the framework by Tardy (1985) to create a systemic scale that measures the social support status of various types and different sources in a school context. Applying this measure, empirical studies have shown that each source and type of social support buffers academic motivation in its own way, although a comprehensive model is yet to be developed (Malecki & Demaray, 2003; Demaray et al., 2005; Wentzel et al., 2010; Song et al., 2015; Tennant et al., 2015).

Moreover, the extant literature has shown the distinct impact of various types of social support on students' academic motivation. Beyond the primary and secondary education levels, parental support continues to play a crucial role in college education, particularly when parents possess higher educational attainments, leading to higher academic achievements (Khan et al., 2015; Azhar et al., 2014; Davis Kean, 2005; Vellymalay, 2011). This finding suggests that parents with higher level of educational attainment may offer more substantial informational support, thereby aiding their children in navigating the challenges of college studies. Moreover, it has consistently demonstrated that parents with lower levels of education exhibit a heightened perception of emotional distance upon their children's departure for college—a realm of life that lies beyond their familiarity, which may result in decrease of emotional support they provide (Piper & Breckenridge-Jackson, 2007; Mitchell et al., 2009).

Additionally, evidence points to the distinct contributions of informational and emotional support from parents in either bolstering students' academic motivation or mitigating their anxieties related to academic performance (Leung et al., 2010). These investigations suggest that the diverse forms of social support can yield varied effects on academic motivation, underscoring the importance of considering the unique roles each type of support plays in shaping students' educational pursuits.

**Types of social support and goal adjustment.** The main focus of the current research is the association between the type of social support and the adjustment of an academic goal that has become overambitious due to an intermediate setback during early adulthood. While prior studies have underscored the pivotal roles of informational and emotional support in maintaining academic motivation at the grade school level, the extent to which these types of support remain influential in shaping academic motivation during early adulthood remains relatively unexplored

(Malecki & Demary, 2003; Demary et al., 2005; Wentzel et al., 2010; Song et al., 2015; Tennant et al., 2015). Moreover, little attention has been given to examining whether each type of social support assumes distinct functions within the compensatory secondary control processes aimed at overcoming challenges associated with difficult academic goal pursuits.

In light of the previous discussion on the goal adjustment process, the current research expected that informational social support will help individuals recognize that the failing goal should be devalued and transfer potential value to a more achievable alternate goal. By doing so, individuals can extricate themselves from the biased state of overestimating the value and achievability of the unattainable goal, thus successfully disengaging from its pursuit (Heckhausen et al., 2010; Brandstätter & Schüler, 2013). Furthermore, it is hypothesized that receiving higher levels of emotional support engenders a heightened sense of social acceptance, enabling individuals to lower concerns regarding potential threats to their social belonging resulting from lowered achievements (Wrosch et al., 2003). In addition, it is expected that emotional social support will help individuals mitigate the depressive or frustrated emotion experienced from disengaging from the overambitious goal and generate more positive emotion so that they can reinitiate motivational commitment to the adjusted goal.

In accordance with these predictions, the present project's theoretical aim is twofold: First, to investigate the role of informational and emotional social support in adjusting the aspiration level of academic goals and second, and to examine the role of emotional social support in sustaining academic motivation after making a goal adjustment.

## **Change in Social Support during the Transition from High School to College**

### **1. Transitional Challenges and Social Support**

**Change in social support sources throughout the lifespan.** Throughout one's lifespan, the major source of social support changes constantly following an age-normative pattern (Heinze et al., 2015). Family (mostly parents) is the predominant source of support from one's infancy to late adolescence. In young adulthood, family influence decreases, while the number of friends drastically increases and the peer circle becomes the most important source of support. During middle adulthood, the spouse becomes the prominent source. The reliance on friends and family increases again in later adulthood, although the number of sources may decrease over time (Walen & Lachman, 2000; Martinez et al., 2011; Gurung et al., 2003; Heinze et al., 2015).

**Transitional challenges in securing social support.** A change in social support often takes place at the transitional points people commonly experience across their lifespan, including the transition from school to college, the transition from college to work, getting married, retiring, etc. At these transitional points, individuals move from institution to institutions or region to region, and the social or regional relocation may induce challenges in securing social support (Carlisle-Frank, 1992; Moyle & Parkes, 1999). During these transitions in general, previous support may become weaker, while success in obtaining a new network of social support is not warranted. As a result, an individual sometimes experiences a lack of social support. In light of the previous discussion about the benefits of social support on motivational self-regulation, the lack of support taking place due to a transition may negatively affect an individual's ability to overcome the struggles in the pursuit of challenging goals.

### **2. Transition from High School to College**

During the transition from high school to college, there are unique challenges in maintaining or establishing a support network due to the sudden increase in independence and the abrupt exposure to a new lifestyle (Zarret & Eccles, 2006). Although youths had already experienced a certain increase in autonomy in high school, college provides them with the first environment in their lives to practice true independence from their family (Arnett, 2000; Flanagan et al., 1993; Sherrod, Haggerty, & Featherman, 1993; Zarret & Eccles, 2006). Therefore, it may be inferred that youths will often rely on their own self-regulation capacities in times of challenges in goal pursuit. At the same time, the changes in social relations and being forced to adjust to novel social norms can sometimes result in social isolation, a loss of academic motivation, and in extreme cases, dropping out of college (Compas et al., 1986; Faye & Sharpe, 2008).

In fact, when adolescents leave their families to attend college, they experience a decrease in perceived support from parents, an increase in loneliness, and a heightened level of social anxiety, and these outcomes can undermine their academic motivation (Larose et al., 2019). In addition, a significant number of college students has been reported to have difficulties in establishing social support in their college environments and tended to lose academic motivations or to develop mental health problems (Storrie et al., 2010; Faye & Sharpe, 2008; Paul et al., 2015). Considering that one of the major motivators for college students to continue enrollment is the sense of social belonging to their Institutions, it is not surprising that many college students experience serious struggles in maintaining the academic motivation they had in high school (Allen et al., 2008; Clark et al., 2014; Hussar et al., 2020).

These challenges from transitioning from high school to college can also be experienced differently depending on the ethnicity of the person who receives the social support, making

several culture-specific struggles. The transition from high school to college affects Asian Americans and European Americans differently in terms of parental support and academic achievement. Asian families tend to have later timelines for youth autonomy, which can pose self-regulatory challenges for Asian American students during this transition (Feldman & Rosenthal 1991; Dmitrieva et al., 2008). Additionally, Asian Americans experience higher levels of parent-child conflict compared to European Americans during their college years (Greenberger & Chen, 1996). These factors contribute to Asian Americans reporting poorer adjustment to college and lower levels of parental support, leading to differences in academic achievement compared to European Americans. (Chang et al., 2010b).

To summarize, it can be inferred that entering college may expose individuals to the risk of experiencing a lack of social support within the institution and is likely to create difficulties in regulating motivation. Specifically, it is possible that their use of compensatory control strategies, including goal adjustment for their academic goals, may be disrupted. Thus, an aim of this research was to investigate the association between social support and the goal adjustment of difficult academic goals among young adults.

## **Present Research**

### **1. Rationale of the Dissertation Project**

The pursuit of postsecondary degree attainment usually requires multiple years of dedication, and there are smaller sub-goals stepwise leading to success. The intermediate academic goals include being accepted to the desired postsecondary institute, receiving the desired grades for required (or selected) courses, and successfully graduating. On a more fine-grained level, earning certain scores from a midterm exam or an individual course assignment may also be conceived as a smaller sub-goal to attain a desired grade for a specific course.

Unfortunately, the sub-goals are sometimes not accomplished, and this failure may undermine a student's motivation to engage with the larger academic goal. In other words, intermediate setbacks could signal to individuals that their academic goal has become overambitious and that it will not be attained. In these cases, according to the theoretical context discussed in section about individual agency in difficult goal pursuit in the second chapter, adjusting a goal to a more realistic level could be effective in maintaining one's motivation and preventing giving up too soon. Thus, the aim of the present research is to empirically observe how students who failed to attain a sub-goal leading to an educational goal respond in terms of adjusting their educational goal to maintain motivation. In addition, the aim is to contribute to the literature on the motivational self-regulation of overambitious goals by revealing the social contexts and in particular the types of social support that facilitate or inhibit the application of goal adjustment strategies.

The expectation was that using college students as samples in the studies comprising the dissertation project would provide two advantages. First, college students are expected to undergo significant changes in their social networks during the transition from adolescence to



young adulthood. In the typical college scenario, parental influence may decrease, while other socialization agents, such as peers, academic counselors, and faculty members, may become more prominent influencers of students' academic motivation and behavior. However, not every college student succeeds in creating a new support network within college society. Due to these difficulties, some college students are expected to be at risk of experiencing a lack of social support. It is postulated that this risk may create significant variances in the sources and types of social support provided to each college student, which allows for a detailed analyses of the multidimensional function of social support.

The second advantage of observing a college sample is in line with the previous findings introduced in the section about transition from high school to college in the fourth chapter. College students frequently struggle with maintaining their academic motivation, and it is closely related to the social support they establish within the college context (Allen et al., 2008; Clark et al., 2014). The difficulties in sustaining academic motivation reported in these studies imply that in college a greater degree of motivational self-regulation is required, while the studies also suggest probabilities that the motivational self-regulation capacity may interact with socialization factors.

To analyze the role of social support in detail, the current research includes separate predictions for social support provided from different sources, parents on the one hand and college based social support sources (i.e., peers and faculty members) on the other hand. First, it is hypothesized that parental support decreases when students move out from their parents to transit from high school to college and that the decrease negatively affects the college students' academic motivation. Second, based on literature on the positive correlation between parental educational attainment and the provision of support, leading to heightened academic motivation

during college, it is hypothesized that the decline in parental support during the transition from high school to college and its negative effect on academic motivation is more evident when the parents' educational level is lower (Khan et al., 2015; Vellymalay, 2011; Piper & Breckenridge-Jackson, 2007; Mitchell et al., 2009). Third, it is predicted that the social support available within the college context (i.e., peers and faculty members) assists students in the execution of adaptive self-regulation involving goal adjustment when an academic goal becomes overambitious.

To explore the multidimensional nature of social support, the present research distinguishes between informational and emotional support in all predictions. Firstly, the examination of the relationship between diminished parental support and college academic motivation investigates whether this pattern varies depending on the type of support provided from parents (i.e., informational and emotional).

Secondly, in the context of college students' adjustment of academic goals to sustain academic motivation, the research predicts that informational and emotional support exert distinct influences on the process of goal adjustment, operating through different pathways.

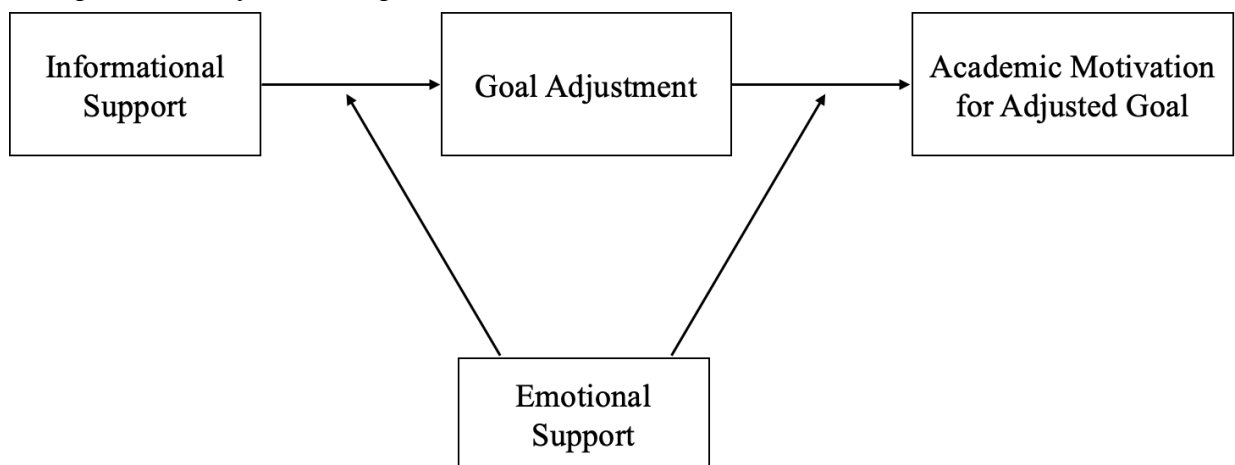
To begin with, informational support regarding the expectancy for goal attainment is predicted to aid in the adjustment of the goal's aspiration level. Informational support may assist in the adjustment process by providing a reality-oriented input into estimating the expectancy for goal attainment that motives a disengagement from the original unrealistic goal and a goal reengagement with a more realistic adjusted goal.

Furthermore, it is posited that emotional support plays a significant role in the goal adjustment process by fostering an increased sense of social acceptance. Prior research has consistently demonstrated that higher levels of parental acceptance exert a positive influence on academic motivation, not only during the formative years of grade school but also throughout

early adulthood (Wang & Eccles, 2012; Ralte & Fente, 2018; Lorijn, et al, 2021). Similarly, peer group acceptance has consistently emerged as a salient factor closely associated with academic motivation and scholastic achievement, spanning from childhood to college years (Ryan & Shin, 2018; Loeb et al., 2020; Gest et al., 2006; Véronneau et al., 2010; Lorijn, et al, 2021). Building upon these findings, the current study hypothesizes that the perceived sense of substantial social acceptance measured through an emotional social support scale may facilitate individuals' ability to adjust their goals without concerns of disappointing their close connections (Wrosch et al., 2003).

Lastly, emotional support is predicted to assist students in the motivational activation in the transition from goal disengagement to the goal engagement with the adjusted goal. Positive emotions evoked by social support are predicted to assist individuals in handling negative emotion experienced after goal disengagement and facilitate goal engagement with the adjusted goal. Presented in Figure 1 is a conceptual depiction of the hypothesized associations among the constructs of interest.

**Figure 1.**  
*Conceptual Model for the Proposed Dissertation Research*



*Note.* Sources of social support examined in the dissertation are parents, peers, and faculty members.

In sum, to conduct an in-depth exploration of the associations among the social support, goal adjustment, and academic motivation of college students, the following specific questions are investigated: (1) Does leaving parents for college result in a decrease in parents' support (i.e., emotional and informational)? (2) Do the changes in parental support (i.e., emotional and informational) that occur between high school and college predict students' academic motivation in college? (3) When college students receive disappointing performance feedback, does goal adjustment help them maintain their academic motivation? (4) Does social support (i.e., emotional and informational) attained within the college context (i.e., peers and faculty members) help college students adjust their academic goals and protect academic motivation against the lower-than-expected performance feedback? (5) Does social support (i.e., emotional and informational) from parents help college students adjust their academic goals and protect academic motivation against the lower-than-expected performance feedback? (6) When college students are in need of adjusting goal to maintain academic motivation but are lacking support within college context to help them adjust goal, does parental support serve a compensatory function?

## **2. Hypotheses**

To address the presented research questions, the current dissertation contains three longitudinal studies. Study 1 includes longitudinal data collected yearly from high school students in Los Angeles Unified School District (LAUSD), starting from their senior year in high school to the first year in college. Study 1 addresses Research Question 1 by investigating whether informational and emotional support from parents decrease when high school students relocate to enter college and whether the decrease is more evident among the participants whose parents are with lower educational levels. Study 1 also answers Research Question 2 by

examining whether such declines in parental support predict lower academic motivation during college. Furthermore, Study 1 observes the role of participants' ethnicity in the dynamics between changes in parental support and academic motivation during college, drawing upon previous literature indicating Asian American college students are less likely to receive support from parents compared to other ethnic groups (Greenberger & Chen, 1996; Chang et al., 2010b).

Study 2 includes longitudinal data collected through a set of weekly surveys administered in Fall 2019 academic quarter. The data was collected as a part of a multiple-year ongoing project named Measurement of Undergraduate Success Trajectories (MUST), which was designed to investigate undergraduates' experiences and successes. This longitudinal data set allows to track students' responses to receiving a dissatisfactory midterm score in a difficult course, and thus allows to investigate the processes central to Research Question 3. In this scenario, it was expected that students who adjust their academic goal would be able to maintain their academic motivation instead of becoming discouraged and demotivated due to lower-than-expected academic performance. Moreover, it is anticipated that students exhibiting a substantial disparity between their anticipated and attained exam scores would derive greater benefits from goal adjustment. Because these individuals are more likely to have initially held expectations that were unrealistically high. Research Question 4 is addressed through examining (1) if informational social support from the college environment would help the student adjust course grade goals, (2) if emotional social support from the college environment would help the student adjust course grade goals, and (3) if emotional social support from the college environment would positively predict the level of maintained motivation after adjusting one's goal.

Study 3 comprises a longitudinal dataset that was collected in Fall 2021 academic quarter in a new cohort of students studied in the context of the MUST project. Study 3 addresses

Research Question 5 and Research Question 6 by examining (1) how parental informational and emotional support affect college students' use of goal adjustment strategies and academic motivation for the adjusted goal (2) and if parental support can compensate for lack of social support within the college context to aid motivational self-regulation processes.

Using the general framework depicted in Figure 1, the following hypotheses will be tested:

**Research question 1 (addressed in Study 1):** Does leaving parents for college result in a decrease in parents' support (i.e., emotional and informational)?

- Hypothesis 1.1: Young adults leaving for college experience a decrease in emotional support from their parents.
- Hypothesis 1.2: Young adults leaving for college experience a decrease in informational support from their parents.
- Hypothesis 1.3: The negative effect of departure for college on parental emotional support is stronger when parental education level is lower.
- Hypothesis 1.4: The negative effect of departure for departure for college on parental informational support is stronger when parental education level is lower.

**Research question 2 (addressed in Study 1):** Do the changes in parental support (i.e., emotional and informational) that occur between high school and college predict students' academic motivation in college?

- Hypothesis 2.1: A decline in emotional support from parents between high school and college negatively impacts students' academic motivation.

- Hypothesis 2.2: A decline in informational support from parents between high school and college negatively impacts academic motivation.

**Exploratory research question (addressed in Study 1):** Does a decrease in parents' support (i.e., emotional and informational) that occurs between high school and college and its effect on the academic motivation differ between ethnic groups?

**Research question 3 (addressed in Study 2):** When college students receive disappointing performance feedback, does goal adjustment help them maintain their academic motivation?

- Hypothesis 3.1: A disappointing performance in the midterm exam negatively affects college students' academic motivation.
- Hypothesis 3.2: Implementing motivational self-regulation strategies of goal adjustment helps college students maintain academic motivation after receiving lower than expected midterm scores.
- Hypothesis 3.3: The effectiveness of goal adjustment in maintaining academic motivation is more significant when the difference between expected and actual midterm scores is larger.

**Research Question 4 (addressed in Study 2).** Does social support (i.e., emotional and informational) attained within the college context (i.e., peers and faculty members) help college students adjust their academic goals and protect academic motivation against the lower-than-expected performance feedback?

- Hypothesis 4.1: Peer emotional and informational support positively predicts the use of goal adjustment strategies among college students.
- Hypothesis 4.2: Peer emotional support positively predicts higher levels of academic motivation after adjusting goal.

- Hypothesis 4.3: Faculty members' emotional and informational support positively predicts the use of goal adjustment strategies among college students.
- Hypothesis 4.4: Faculty members' emotional support positively predicts higher levels of academic motivation after adjusting goal.

**Research Question 5 (addressed in Study 3):** Does social support (i.e., emotional and informational) from parents help college students adjust their academic goals and protect academic motivation against the lower-than-expected performance feedback?

- Hypothesis 5.1: Parental emotional and informational support positively predicts the use of goal adjustment strategies among college students.
- Hypothesis 5.2: Parental emotional support positively predicts higher levels of academic motivation after adjusting goal.

**Research Question 6 (addressed in Study 3):** When college students are in need of adjusting goal to maintain academic motivation but are lacking support within college context to help them adjust goal, does parental support serve a compensatory function?

- Hypothesis 6.1: Parents' informational support and peer informational support demonstrate a compensatory interaction in predicting a greater use of goal adjustment strategies.
- Hypothesis 6.2: Parents' emotional support and peer emotional support demonstrate a compensatory interaction in predicting a greater use of goal adjustment strategies.
- Hypothesis 6.3: Parents' emotional support and peer emotional support demonstrate a compensatory interaction in predicting higher levels of academic motivation after adjusting goal.



- Hypothesis 6.4: Parents' informational support and faculty members' informational support demonstrate a compensatory interaction in predicting a greater use of goal adjustment strategies.
- Hypothesis 6.5: Parents' emotional support and faculty members' emotional support demonstrate a compensatory interaction in predicting a greater use of goal adjustment strategies.
- Hypothesis 6.6: Parents' emotional support and faculty members' emotional support demonstrate a compensatory interaction in predicting higher levels of academic motivation after adjusting goal.

**Exploratory research question:** When college students are in need of adjusting goal to maintain academic motivation, do peers' and faculty members' social support show compensatory interaction?

## Chapter 2: Methods and Results

### Study 1

#### Study 1: Participants & Procedure

Data for this longitudinal study (the LAUSD Study) were originally collected as part of a larger longitudinal study on youth transitioning to post-secondary education or to the workplace (Chang et al., 2006; Chung, Chen et al., 2009). High school seniors from four schools in Los Angeles Unified School District were recruited, and a multi-ethnic working and lower middle-class sample was obtained. The first assessment was conducted within one month of high school completion (Time 1). Thereafter, a reassessment was conducted every year for four years (Time 2 to 5). Informed consent (and parental consent if the participants were underaged) was obtained in Time 1. The data from Times 1 and Time 2 are being used to examine how the association between parental support and academic motivation changes when the participants transit from high school to college.

In Time 1, 1,183 participants were recruited and compensated by being entered in a gift raffle with a price range from \$10 to \$20. During the Time 2 data collection, the participants were invited via mail to participate and were informed that a \$40 check would be provided as compensation, and 452 of the participants remained in the study. In the current study, 79 participants who were not attending college at Time 2 were excluded from analysis (38.7% attended 4-year college; 38.9% attended 2-year college; 4.9% attended vocational or technical school; 17.5% did not attend any higher education institute) and 373 participants' data were used in the study.

To assess the differences in participant characteristics between those who dropped out or had incomplete data and those who provided complete data throughout the study duration,

attrition analyses were conducted. The results of these analyses revealed that no demographic characteristics demonstrate varying rates of participant attrition.

### **Study 1: Measures**

Study 1 measurement items are included in Appendix.

*Demographics.* Demographic variables were collected in Time 1. Participants provided responses to basic demographic inquiries for their sex (Female = 0; Male = 1), age, and ethnicity (Black = 1; Asian = 2; Hispanic = 3; White = 4; Others = 5). Participants in this study were aged between 17 and 18 years old at Time 1, with 37.5% of respondents being 17 years old, 56.3% being 18 years old, and 3.8% not specifying their age. Sex distribution was nearly balanced, with 59.2% identifying as male and 40.2% as female. Regarding race, the majority of participants identified as follows: Black (9.1%), Asian (27.7%), Hispanic (24.4%), White (26.0%), and Others (18.8%). The largest ethnicity group was European American participants, comprising 26.0% of the sample and serving as the reference group in the analyses.

*Parental Education Level.* The highest education attainment level of their parents was surveyed (Junior high / high / no response = 1; Two-year college = 2; Four-year college = 3; Graduate degree = 4). When the educational level of both parents was reported, a higher level of attainment was selected. When the participants reported only one side or were living in single-parent households, the reported values were used. 26.8% of the participants reported that their parents had completed junior high, high school, or did not provide a response. 21.7% of the participants reported that their parents had attended a two-year college, 29.5% reported that their parents had completed a four-year college, and 21.4% reported that their parents held a graduate degree. Two participants did not provide information regarding their parental education level. The examined models categorized participants into two groups: those with non-college-educated

parents (coded as 0) and those with college-educated parents (coded as 1). This grouping variable was labeled Parental Education Level.

*Living Condition.* Both during Time 1 and Time 2, participants were administered a query concerning their residential situation. Specifically, they were requested to indicate whether they resided with their parents (coded as 0) or with individuals other than their parents, such as living independently, cohabitating with roommates, or under the guardianship of others (coded as 1). At Time 1, all participants (100%) reported living at home with their parents. By Time 2, 37.0% of the participants had moved out of their parents' home, while 62.7% continued to reside with their parents. One participant did not provide information regarding their living condition. Time 2 measurement was included in the analysis and was labeled Living Condition.

*Enrollment Type.* The types of college enrollment type at Time 2 were surveyed through a self-report questionnaire. Participants reported whether they were attending four-year college (coded as “four-year”), two-year / community college (coded as “two-year”), or vocational / technical school (coded as “others”). 46.9% of the participants were attending four-year college, 47.2% were attending two-year / community college, and 5.9% were attending vocational / technical school (coded as 3). The largest group was 2-year / community college participants and was treated as the reference group in the analyses.

*Parental Support.* Informational and emotional parental support were measured in Time 1 and Time 2 as subconstructs of a perceived social support scale in the original study. Participants were asked, “How many times during the past 6 months have your parents done the following things,” and they responded on a 4-point Likert scale (1 = Never; 2 = Once or twice; 3 = 3 to 4 times; 4 = More often). Informational support was measured using two items related to academic goals (e.g., “Gave you advice about your schoolwork) and emotional support was measured

using five items (e.g., “Told you that you are OK just the way you are”). The scores across each set of items in each measurement time were averaged. The level of emotional support from parents was labeled as Parental Emotional Support and the level of informational support from parents was labeled as Parental Informational Support.

Parental support assessments through all measurement points and demonstrated acceptable levels of variance and relatively balanced distributions. For Parental Informational Support at Time 1, a Pearson's correlation between two items yielded a satisfactory correlation coefficient ( $r = .607$ ). The measurement reliability of Parental Emotional Support at Time 1 was good, as indicated by Cronbach's alpha ( $\alpha = .843$ ). Similarly, at Time 2, the Parental Informational Support displayed an acceptable correlation between its two items ( $r = .733$ ), and Parental Emotional Support exhibited high measurement reliability ( $\alpha = .858$ ).

Analyses examining the change in mean levels of Parental Emotional Support and Parental Informational Support from Time 1 to Time 2 revealed non-significant differences across the participants ( $t(337) = 1.26, p = .207$  and  $t(304) = -.041, p = .968$ , respectively).

*Academic motivation.* For an indicator of academic motivation, participants' motivational commitment to achieving academic goals was measured in Time 2 using the goal engagement subscales, selective primary control (SPC) and selective secondary control (SSC) of the Optimization in Primary and Secondary Control (OPS) scale (Heckhausen, et al., 1998; Heckhausen & Tomasik, 2002). The original scale was modified for education goals, and a 5-point Likert scale (1 = Strongly disagree; 5 = Strongly agree) was used. SPC was assessed through four items (e.g., I will work hard to get a good education), and SSC was assessed through four items (e.g., I often tell myself that I will be successful in reaching my educational goals). The scores were averaged across the subscales to obtain the academic motivation.

Scores on the Academic Motivation scale showed significant variance and a balanced distribution, making it suitable for further regression analyses. The scale demonstrated acceptable internal consistency, with Cronbach's alpha yielding a value of .786.

### **Study 1: Plan for Data Analysis**

The primary analytical approach utilized was Ordinary Least Squares (OLS) regression for moderated mediation, which allowed for a comprehensive examination of the research questions.

The first set of predictor variables included Living Condition measured in Time 2 and Academic Motivation in college. These variables were selected to understand how leaving their parents in Time 2 influenced the participants' subsequent academic motivation. To explore the mechanisms through which living conditions impacted academic outcomes, two mediator variables were included: Parental Emotional Support (Time 2) and Parental Informational Support (Time 2). These mediators were chosen to capture the process by which living conditions (i.e., whether the participants left their parents) influenced the level of support received from parents and how these differences in support ultimately affected academic motivation.

The study also explored the moderating role of Parental Education Level. By examining the interaction between Living Condition and Parental Education Level, the analysis aimed to determine whether the association between living conditions and changes in parental support variables differed depending on the educational attainment of the parents. The inclusion of this moderator variable expanded the understanding of how various factors interacted to influence the relationship between living conditions and parental support.

Following the four-step approach by Baron and Kenny (1986), the first step examined the association between the categorical predictor (Living Condition) and the continuous outcome variable (Academic Motivation) (C-path). In the second step, the association between the categorical predictor (Living Condition) and the mediators (Parental Emotional Support (Time 2); Parental Information Support (Time 2)) was examined (A-path). In the third step, the association between the mediators (Parental Emotional Support (Time 2); Parental Information Support (Time 2)) and the outcome variable (Academic Motivation) was examined (B-path). In the fourth step, the direct association between the categorical predictor (Living Condition) and the outcome variable (Academic Motivation) when controlling for the mediators (Parental Emotional Support (Time 2); Parental Information Support (Time 2)) was examined (C'-path) to assess whether the mediation is full or partial. The bootstrapping of indirect effects approach (Hayes, 2017) was utilized to test the statistical significance of indirect pathways. The bootstrap sample was set at 5,000, and the significant confidence interval was set at 95%. A bootstrapped 95% CI that did not contain zero indicated a significant indirect effect (Hayes, 2017).

To ensure a robust analysis, Parental Emotional Support (Time 1) and Parental Informational Support (Time 1) were controlled in the model as baseline measurements. This allowed for a longitudinal interpretation of the results and accounted for the initial levels of parental support provided at time 1. To account for potential confounding variables, covariates such as sex, age, ethnicity, and enrollment type were also controlled for in the model. These variables were included to minimize their potential influence on the relationships being examined, ensuring a more accurate estimation of the effects of the primary variables. The conceptual diagram illustrating the regression coefficients (see Figure 2) and the detailed model

parameters (see Table 3) provided a visual representation and a comprehensive summary of the analytic model.

Furthermore, to explore potential variations across participants' ethnicities, the trends identified in the hypothesis testing were examined by the ethnicity groups. This exploratory analysis aimed to determine whether the change of parental support and its influence on academic motivation differed for participants from diverse ethnic backgrounds. By considering the role of ethnicity, the study sought to understand potential cultural or contextual influences on the observed associations. In this purpose, and two analysis of covariance (ANCOVA) were conducted. The first model used ethnicity as the categorical independent variable and Parental Emotional Support (Time 2) as the outcome variable, and the participants' sex, age, Parental Education Level, enrollment type, and Parental Emotional Support (Time 1) were controlled as covariates. The second model used ethnicity as the categorical independent variable and Parental Informational Support (Time 2) as the outcome variable, and the participants' sex, age, Parental Education Level, enrollment type, and Parental Informational Support (Time 1) were controlled as covariates.

All analyses were conducted using IBM SPSS Version 24.

## **Study 1: Results**

### **Descriptive Analyses**

Correlation analyses are conducted for the variables of central interest in the study and presented in Table 2. Firstly, a high intercorrelation was observed among the parental support variables. These results suggest a robust relationship between different dimensions of parental support. Secondly, support variables from all time points significantly predicted higher levels of



academic motivation at Time 2. This underscores the importance of receiving parenting support in fostering academic motivation.

Living Condition and Parental Informational Support (Time 1) displayed a negative correlation, indicating that students who had received more informational support from parents at Time 1 were more likely to leave home to attend college ( $r = .14, p = .007$ ). Additionally, Parental Educational Level exhibited a positive association with Living Condition, suggesting that participants with parents who had higher educational attainment were more likely to leave home to attend college ( $r = .25, p < .001$ ).

It is important to consider that these correlations between living condition, parental informational support, and parental educational level may be influenced by the contrast between the "four-year" group and the "two-year" group. It is well-documented that community college enrolled students are more inclined to commute from their parents' houses, have received less parental support during high school, and come from families with lower socio-economic status, as indicated by parental education level (Ishitani & McKittrick, 2010; Walpole, 2003; Leonard, 2013). A chi-square test was conducted to examine the association between enrollment type and Living Condition, revealing that in the current dataset, the "four-year" group was more likely to leave home to attend college, whereas the "two-year" group and "others" group were more likely to stay home with their parents ( $\chi^2(2, 372) = 135.33, p < .001$ ).

To investigate whether the correlations between living condition, parental informational support, and parental educational level are solely due to the contrast between enrollment types, separate correlation analyses were conducted for the "four-year" group (group 1) and the combined "two-year" group and "others" group (group 2). The results revealed that in both groups, correlations between Living Condition and Parental Informational Support (Time 2)

(group 1:  $r = .26, p = .001$ ; group 2:  $r = .18, p = .020$ , respectively), as well as Parental Educational Level and Living Condition (group 1:  $r = .16, p = .035$ ; group 2:  $r = .15, p = .175$ ), were significant. These findings suggested that the effects are not due to the contrast between the two groups.

Overall, these results indicated that participants across all forms of higher education enrollment were qualitatively similar in terms of their dynamics with the variables of interest. Consequently, it was justified to proceed with the hypothesis testing procedure using a combined sample of all enrollment types, while using enrollment type as a covariate. Furthermore, to ensure the robustness of the findings, hypothesis testing was repeated separately for the "four-year" group only. These results are included in Appendix B.

The study employed multiple analysis of covariance (ANCOVA) procedures to examine potential variations in the variables of interest across diverse demographic groups. Parental Informational Support (Time 2, with Time 1 measurement controlled) did not differ by sex ( $F(1, 286) = .61, p = .436, \eta^2 = .00$ ), ethnicity ( $F(4, 286) = .24, p = .914, \eta^2 = .00$ ), enrollment type ( $F(2, 286) = 1.15, p = .319, \eta^2 = .01$ ), and Parental Education Level ( $F(1, 287) = .76, p = .385, \eta^2 = .00$ ). Further, Parental Emotional Support (Time 2, with Time 1 measurement controlled) also did not differ by sex ( $F(1, 318) = .35, p = .557, \eta^2 = .00$ ), ethnicity ( $F(4, 318) = 1.41, p = .232, \eta^2 = .02$ ), enrollment type ( $F(2, 318) = 2.88, p = .058, \eta^2 = .03$ ), and Parental Education Level ( $F(1, 319) = .06, p = .808, \eta^2 = .00$ ). Lastly, Academic Motivation also did not differ by sex ( $F(1, 308) = .66, p = .416, \eta^2 = .00$ ), ethnicity ( $F(3, 308) = .89, p = .473, \eta^2 = .02$ ), enrollment type ( $F(2, 308) = .54, p = .584, \eta^2 = .00$ ), and Parental Education Level ( $F(1, 309) = .44, p = .510, \eta^2 = .00$ ) (for more detailed results regarding ethnicity, see Table 4 and Table 5.)

Table 1

*Study 1 constructs: sample sizes, ranges, means, standard deviations, and distributions*

Variables	N	%	Min	Max	M	SD	Skewness		Kurtosis	
							Statistic	SE	Statistic	SE
Sex										
Male	221	59.2								
Female	150	40.2								
Missing	2	.1								
Age	364		17	19	17.65	.55	.06	.13	-.77	.26
Ethnicity										
Black	34	9.1								
Asian	81	27.7								
Hispanic	91	24.4								
White	97	26.0								
Others	70	18.8								
Parental Education Level										
Non-college-educated	100	26.8								
College-educated	271	72.7								
Missing	2	.1								
Living Condition										
With parents	234	62.7								
Without parents	138	37.0								
Missing	1	.0								
Enrollment Type										
Four-year	175	46.9								
Two-year	176	47.2								
Others	22	5.9								
Parental Emotional Support (T1)	346		1.00	4.00	3.33	.76	-.90	.13	.66	.26

Parental Informational Support (T1)	329	1.00	4.00	3.06	.65	-.66	.13	.27	.27
Parental Emotional Support (T2)	363	1.00	4.00	3.29	.77	-.95	.13	.52	.26
Parental Informational Support (T2)	341	1.00	4.00	3.06	.71	-.64	.13	-.16	.26
Academic Motivation (T2)	328	2.03	5.00	4.21	.41	-.91	.14	2.31	.27

*Note.* T1 = Time 1; T2 = Time 2. *M* and *SD* represent mean and standard deviation, respectively. The ethnic and gender diversity of the sample was reflective of the student demographics of the region and university student body (Chang et al., 2010b).

Table 2

*Pearson's correlations between Study 1 constructs*

	1	2	3	4	5	6	7
1 Parental Education Level	1						
2 Living Condition	.25**	1					
3 Parental Emotional Support (T1)	.05	-.09	1				
4 Parental Informational Support (T1)	.03	-.15**	.67**	1			
5 Parental Emotional Support (T2)	.08	-.06	.54**	.36**	1		
6 Parental Informational Support (T2)	-.00	-.09	.42**	.48**	.66**	1	
7 Academic Motivation	-.06	-.10	.15**	.15*	.26**	.20**	1

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

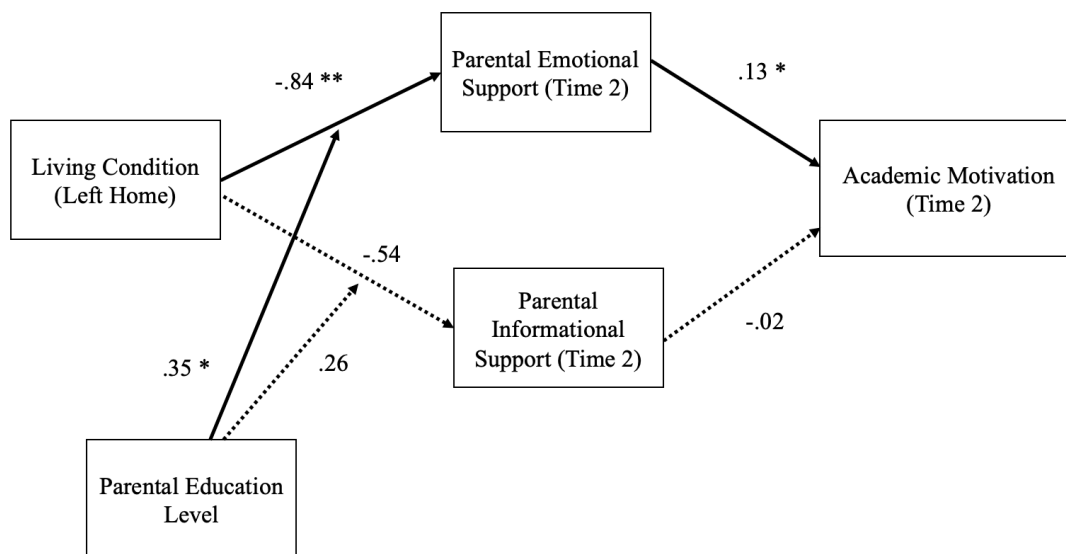
## Hypothesis Testing

Study 1 Aim: Exploring the change of parental support that takes place when young adults leave parents to attend college and its consequences on the young adult's academic motivation in college. Research question 1 and 2 were assessed using a mediated moderation regression model (see Figure 2 and Table 3). The results of these analyses are discussed below.

**Research question 1:** *Does leaving parents for college result in a decrease in parents' support (i.e., emotional and informational)?*

**Figure 2**

*Diagram of Coefficient Parameters and Significances Pertaining to Research Question 1 and 2*



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

Table 3

*Coefficients and significances between constructs pertaining to Research Question 1 and 2*

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Outcome:					
Parental Emotional Support (Time 2)					
(constant)	2.25	1.39	.108	-.50	4.99
Living Condition	-.84	.32	.009	-1.46	-.21
Parental Education Level	-.05	.08	.531	-.22	.11

Living Condition * Parental Education Level	.35	.14	.013	.07	.63
Parental Emotional Support (Time 1)	.61	.07	< .001	.47	.76
Male	-.08	.09	.354	-.25	.09
Age	-.04	.08	.621	-.19	.11
Ethnicity					
Black	-.01	.17	.929	-.34	.31
Asian	-.04	.13	.735	-.29	.21
Hispanic	-.27	.14	.057	-.54	.01
Others	.09	.13	.475	-.16	.34
Enrollment Type					
Four-year	.08	.11	.465	-.14	.30
Others	.48	.17	.007	.13	.82
Outcome:					
Parental Informational Support (Time 2)					
(constant)	1.14	1.34	.395	-1.5	3.78
Living Condition	-.54	.31	.079	-1.14	.06
Parental Education Level	-.14	.08	.071	-.30	.01
Living Condition * Parental Education Level	.26	.14	.061	-.01	.52
Parental Informational Support (Time 1)	.33	.08	< .001	.17	.50
Male	-.00	.08	.998	-.17	.17
Age	.03	.07	.643	-.11	.18
Ethnicity					
Black	-.02	.16	.912	-.33	.30
Asian	-.08	.12	.534	-.32	.16
Hispanic	-.19	.13	.163	-.45	.08
Others	-.02	.12	.884	-.26	.22
Enrollment Type					
Four-year	-.00	.11	.965	-.21	.20
Others	.19	.17	.269	-.14	.52
Outcome:					
Academic Motivation					
(constant)	3.8	.86	< .001	2.12	5.49
Living Condition	-.09	.07	.215	-.23	.05
Parental Emotional Support (Time 2)	.13	.05	.013	.03	.22
Parental Informational Support (Time 2)	-.02	.05	.737	-.12	.09
Parental Emotional Support (Time 1)	-.00	.05	.954	-.11	.10
Parental Informational Support (Time 1)	.02	.06	.692	-.09	.14
Male	.03	.05	.537	-.07	.14
Age	-.01	.05	.880	-.10	.09
Ethnicity					
Black	.10	.10	.332	-.10	.30
Asian	.15	.08	.042	.01	.30
Hispanic	.20	.08	.012	.04	.35
Others	.11	.08	.159	-.04	.27

Enrollment Type					
Four-year	.05	.07	.481	-.09	.18
Others	.02	.11	.861	-.20	.23

Note. LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%).  
Sample size = 255.

*Hypothesis 1.1 Young adults leaving for college experience a decrease in emotional support from their parents.*

The analysis revealed a significant association between Living Condition and Parental Emotional Support (Time 2) ( $b = -.84, p = .009, 95\% \text{ CI } [-1.46, -.21]$ ). Specifically, it was found that young adults who transitioned away from their parents' residence to pursue college education were more inclined to encounter a decrease in the level of emotional support received from their parents in comparison to those who opted to continue residing with their parents. Consequently, the evidence supported Hypothesis 1.1.

*Hypothesis 1.2: Young adults leaving for college experience a decrease in informational support from their parents.*

Living Condition did not show a significant association with Parental Informational Support (Time 2) ( $b = -.54, p = .079, 95\% \text{ CI } [-1.14, .06]$ ). The result indicated the participants' transitioning away from their parents to attend college did not change the level of informational support they receive. Therefore, Hypothesis 1.2 was not supported.

*Hypothesis 1.3: The negative effect of departure for college on parental emotional support is stronger when parental education level is lower.*

A significant interaction was observed between Parental Education Level and Living Condition regarding Parental Emotional Support (Time 2) ( $b = .35, p = .013, 95\% \text{ CI } [.07, .63]$ ). To explore the pattern of interaction, conditional effect of the focal predictor (Living Condition) on the outcome variable (Parental Emotional Support (Time 2)) at different values of the

moderator (Parental Education Level) was tested. Two separate OLS regression models between Living Condition and Parental Emotional Support (Time 2) were created depending on the level of Parental Education Level (0 and 1).

The results showed that the association between Living Condition and Parental Emotional Support (Time 2) was significant only in the low Parental Education Level condition ( $b = -.38, p = .020, 95\% \text{ CI } [-.69, -.06]$ ). The association was not statistically significant in the high Parental Education Level condition ( $b = .11, p = .418, 95\% \text{ CI } [-.17, .39]$ ). These outcomes, as visually depicted in Figure 3, underscored that only the young adults whose parents with no college education experienced a decline in emotional support after they left their parents for college. Accordingly, the evidence supported Hypothesis 1.3.

**Figure 3**

*Conditional Effect of Parental Education Level on the Association between Living Condition and Parental Emotional Support*



*Note.* The trends are probed for different values of Prenatal Education Level. Parental Emotional Support (Time 1) was controlled.



*Hypothesis 1.4: The negative effect of departure for college on parental informational support is stronger when parental education level is lower.*

The interaction between Living Condition and Parental Education Level was not significant ( $b = .26, p = .061, CI [-.00, .52]$ ), suggesting that the association between Living Condition and Parental Informational Support (Time 2) did not function differently depending on the level of Parental Education Level. Consequently, Hypothesis 1.4 was not supported.

**Research question 2:** *Do the changes in parental support (i.e., emotional and informational) that occur between high school and college predict students' academic motivation in college?*

*Hypothesis 2.1: A decline in emotional support from parents between high school and college negatively impacts students' academic motivation.*

The results indicated a significant positive association between Parental Emotional Support (Time 2) and Academic Motivation ( $b = .13, p = .013, 95\% CI [.03, .22]$ ). Hence, Hypothesis 2.1 was partially supported.

To explore the moderated mediation effect between Living Condition and Academic Motivation via Parental Emotional Support (Time 2), a bootstrapping approach was utilized to test the indirect effect of Living Condition on Academic Motivation via Parental Emotional Support (Time 2). Three different confidence intervals were created to assess the mediation pattern across varying levels of Parental Education Level (+1SD, mean, and -1SD).

The results revealed a significant indirect effect only when Parental Education Level was low ( $b = -.05, CI [-.11, -.00]$ ) while the indirect effect was not statistically significant in the high Parental Education Level condition ( $b = .01, CI [-.02, .06]$ ). When controlling for Parental Emotional Support (Time 2) in the model, Living Condition did not predict Academic

Motivation ( $b = -.09, p = .215, CI [-.23, .05]$ ), indicating full mediation. The results indicated that leaving home to attend college may negatively affect the students' academic motivation via the decrease of emotional support from parents. Thus, Hypothesis 2.1 was supported, with further evidence suggesting that Living Condition affect Academic Motivation only via Parental Emotional Support (Time 2), and this mediation was only significant when Parental Education Level was low.

*Hypothesis 2.2: A decline in informational support from parents between high school and college negatively impacts academic motivation.*

No statistically significant association was found between Parental Informational Support (Time 2) and Academic Motivation ( $b = -.02, p = .737, 95\% CI [-.12, .09]$ ). These findings, considered alongside the results from Hypothesis 1.2 testing, indicated that there is no mediation by the change in informational support between leaving home to attend college and the level of academic motivation. Thus, Hypothesis 2.2 was not supported.

**Exploratory Research Question:** *Does a decrease in parents' support (i.e., emotional and informational) that occurs between high school and college and its effect on the academic motivation differ between ethnic groups?*

To examine the potential influence of participants' ethnicities on changes in parental support, two ANCOVA models were employed. In the first ANCOVA model, with Parental Emotional Support at Time 2 as the outcome variable, no significant differences were found among the ethnicity groups ( $F(4, 318) = 1.41, p = .232, \eta^2 = .02$ ) (see Table 4). The mean scores for each ethnicity group were as follows: Black ( $M = 3.30, SD = .83$ ), Asian ( $M = 3.16, SD = .80$ ), Hispanic ( $M = 3.24, SD = .79$ ), White ( $M = 3.31, SD = .78$ ), and Others ( $M = 3.43, SD = .68$ ). The inclusion of baseline Parental Emotional Support at Time 1 as a covariate in the

model allowed for a longitudinal interpretation, indicating that the change in Parental Emotional Support from Time 1 to Time 2 did not differ significantly across ethnicities.

In the second ANCOVA model, using Parental Informational Support at Time 2 as the outcome variable, no significant association was observed between ethnicity grouping and parental support ( $F(4, 286) = .24, p = .914, \eta^2 = .00$ ) (see Table 5). The mean scores for each ethnicity group were as follows: Black ( $M = 3.13, SD = .64$ ), Asian ( $M = 3.03, SD = .70$ ), Hispanic ( $M = 3.08, SD = .72$ ), White ( $M = 2.99, SD = .76$ ), and Others ( $M = 3.06, SD = .69$ ). Controlling for baseline Parental Informational Support at Time 1, the results indicated that the change in Parental Informational Support from Time 1 to Time 2 did not differ significantly across participants' ethnicities.

Table 4  
ANCOVA results using Parental Emotional Support (Time 2) as the outcome

Predictor	Sum of Squares	df	Mean Square	F	p
Corrected Model	63.26	11	5.75	13.69	< .001
(Intercept)	.72	1	.72	1.72	.191
Male	.15	1	.15	.35	.557
Age	.01	1	.01	.02	.881
Living Condition	1.71	1	1.71	4.07	.045
Parental Education Level	.17	1	.17	.40	.530
Enrollment Type					
Four-year	2.32	1	2.32	5.52	.019
Others	3.73	1	3.73	8.89	.003
Parental Emotional Support (Time 1)	53.07	1	53.07	126.30	< .001
Ethnicity	2.26	4	.59	1.41	.232
Error	133.61	318	.42		
Total	3748.89	330			
Corrected Total	196.87	329			

Note.  $R^2 = .321$  (Adjusted  $R^2 = .298$ )

Table 5  
*ANCOVA results using Parental Informational Support (Time 2) as the outcome*

Predictor	Sum of Squares	df	Mean Square	F	p
Corrected Model	36.75	11	3.34	8.39	< .001
(Intercept)	.40	1	.40	1.013	.315
Male	.24	1	.24	.61	.436
Age	.02	1	.02	.05	.831
Living Condition	.22	1	.22	.56	.456
Parental Education Level	.35	1	.35	.88	.349
Enrollment Type					
Four-year	.25	1	.25	.62	.431
Others	.84	1	.84	2.10	.148
Parental Informational Support (Time 1)	34.11	1	34.11	85.70	< .001
Ethnicity	.39	4	.10	.24	.914
Error	113.84	286	.40		
Total	2914.19	298			
Corrected Total	150.58	297			

*Note.*  $R^2 = .244$  (Adjusted  $R^2 = .215$ )

The main regression model created for hypothesis testing pertaining to Research Question 1 demonstrated that Academic Motivation scores were higher among Asian ( $b = .15, p = .042$  CI [.01, .30]) and Hispanic ( $b = .20, p = .012, CI [-.04, .35]$ ) participants. However, the ANCOVA results indicated that this difference in Academic Motivation was not associated with changes in parental support.

These findings highlight that ethnicities did not exert a significant impact on changes in parental support, as measured by both Parental Emotional Support and Parental Informational Support. Nonetheless, it is worth noting that Asian and Hispanic participants displayed higher levels of Academic Motivation compared to other ethnic groups, suggesting the presence of other factors contributing to this distinction.

## **Study 1: Discussion**

The present study investigated the effects of young adults leaving their parents to attend college on parental support and its subsequent impact on academic motivation. The findings shed light on the complex dynamics between the change in living conditions, parental support, and educational outcomes, offering insights into the transitional phase of college students and the role of parental involvement during this period.

Consistent with Hypothesis 1.1, the results demonstrated a significant decrease in emotional parental support when young adults left their parents to attend college. This decline in emotional support suggests that the physical separation between parents and college students may lead to a reduction in the perceived emotional availability and responsiveness of parents. These findings align with prior research indicating that the transition to college often involves a decrease in parental support, as young adults are encouraged to develop independence and autonomy (Carlisle-Frank, 1992; Moyle & Parkes, 1999; Zarret & Eccles, 2006).

Contrary to Hypothesis 1.2, the study did not find a significant decrease in informational parental support following the transition to college. This finding suggests that while the physical distance from parents may impact emotional support, the informational support provided by parents may remain relatively stable.

The interaction between Living Condition and Parental Education Level, as hypothesized in Hypothesis 1.3, was statistically significant. The association between leaving parents for college and emotional parental support was significant only among young adults with parents who had lower educational attainment. This finding suggests that Parental Education Level plays a role in shaping the level of emotional support provided to college students.

Regarding Hypothesis 1.4, which proposed a differential effect of leaving parents for college on informational parental support based on Parental Education Level, the results did not support the hypothesis. The lack of a significant association indicates that leaving for college does not necessarily affect the informational support provided by parents, regardless of their educational background. This finding contradicted the hypothesis that parents with higher levels of knowledge and expertise on higher education would provide more explicit and direct informational guidance.

Analyses regarding the effects of changes in parental support on academic motivation supported Hypothesis 2.1. The mediation analysis showed that the physical relocation from parent's house to college may result in the decrease in emotional support from parents, and it is associated with lower levels of academic motivation among college students. This finding emphasizes the importance of emotional support from parents in fostering and maintaining students' motivation towards their academic pursuits.

In contrast to Hypothesis 2.2, which postulated a relationship between changes in parental informational support and academic motivation, the results did not support this prediction. Firstly, there was no observed decrease in parental informational support. Secondly, the analysis revealed that informational support at Time 2 did not significantly predict academic motivation. Consequently, there is no evidence to support the presence of mediation between these variables.

The findings of the moderated mediation analysis provided further insights into the nuanced interplay of factors. The indirect effect of living condition on academic motivation through emotional parental support was significant only for college students with parents who had lower education levels. This suggest that although emotional support from parents tend to

decrease when adolescents leave home to attend college, this may be absent among students with parents with higher educational attainment. In turn, these students will show higher academic motivation compared to other students whose parents have lower educational attainments. In other words, while parental emotional support is crucial in academic motivation in college, the students with parents who had lower educational attainments are at risk of receiving insufficient emotion support from their parents and losing their academic motivation. This highlights the potential role of parental education level as a moderator, influencing the mediating effects of emotional support on academic motivation.

Overall, Study 1 contributes to the existing literature by revealing the impact of leaving parents for college on parental support and its subsequent effects on academic motivation (Compas et al., 1986; Faye & Sharpe, 2008). The findings underscore the importance of emotional support from parents during the transitional phase of college students, particularly for those with parents with lower educational attainment. The findings also suggest that parents are not the critical source of informational support that may help the college students maintain their academic motivation.

Despite the insights gained from Study 1, several limitations should be acknowledged, opening avenues for further investigation to address these gaps in understanding the dynamics between various types and sources of social support and academic motivation. First, while the study demonstrated the effects of social support, specifically emotional support from parents, on academic motivation, it did not delve into the underlying mechanisms by which this social support influences the self-regulation processes of academic motivation. Understanding the mediating factors or pathways through which social support affects self-regulation and

subsequent academic motivation would enhance the comprehension of the complex dynamics at play.

Second, the study did not include an analysis of alternative sources of emotional and informational support, such as peers or faculty members, that college students may rely on. Third, the study revealed an unexpected finding concerning parental informational support. It remains unclear why parental information support did not significantly change when participants left home for college, and why it did not correlate with parental education level. These results raise important questions regarding the factors that contribute to the stability of informational support and its relationship with parental characteristics.

Lastly, it is recommended that future investigations delve into potential contextual factors that may influence parental informational support during the college transition. Factors such as cultural norms, individual differences in communication styles, and variations in the perceived importance of informational support should be explored to gain a comprehensive understanding of the complexities surrounding this phenomenon. Furthermore, these inquiries are essential for shedding light on the reasons behind the unexpected finding in the current study. Specifically, the lack of differentiation in prenatal support change based on participants' ethnicity contradicts previous literature (Chang et al., 2010b).

Building upon this context, Study 2 sought to explore how emotional and informational support from peers and faculty members within the college environment influenced the students' academic motivation and motivational self-regulation for challenging academic goals.



## Study 2

### Study 2: Participants & Procedure

Study 2 focused on exploring the process of self-regulation for challenging academic goals and analyzing the distinct functions of informational and emotional social support provided by peers and faculty members in the college setting. In this purpose, the data collected from an ongoing, multi-year, longitudinal study at the University of California, Irvine (UCI) called the Measurement of Undergraduate Success Trajectories (MUST) project was used. The project was originally designed to investigate undergraduates' experiences and successes.

In the summer of 2019, all undergraduates at UCI who were about to start their freshman or junior year were invited to participate in the study. The recruited undergraduate students ( $N = 1,275$ ) consented to participate and were administered quarterly surveys beginning in the Fall 2019 quarter. Simultaneously, a subsample of participants ( $N = 357$ ) consented to participate in an in-depth version of the study and was administered weekly surveys for an academic year. The weekly surveys consisted of measurements for various domains in their lives, including course-related experiences, social relations, non-academic behaviors, mental health, etc. All surveys were administered online with Qualtrics.

All participants were compensated with \$50 for completing the first quarterly survey and several performance assessments at the beginning of the study. They were compensated with the same amount again after two years. In addition, the subsample of students who participated in weekly surveys received 1 to 2 course credits per quarter.

In the first week of the Fall 2019 quarter, students were asked to report the name of the course in the quarter that was expected to be the most difficult and how many midterm exams were scheduled in the course. Participants who took more than one midterm exam were excluded

in the analysis to make their experience consistent in the current study and the remaining sample size was 323. In accordance with the schedule of courses the participants considered the most difficult, they reported their expected scores from the midterm exam and whether the expectation was met.

By the end of the quarter (week 10), 280 participants remained in the study. To assess the differences in participant characteristics between those who dropped out or had incomplete data and those who provided complete data throughout the study duration, attrition analyses were conducted. The results of these analyses revealed that no demographic characteristics demonstrate varying rates of participant attrition.

## **Study 2: Measures**

Study 2 measurement items are included in Appendix.

*Demographics.* Through access to the administrative data from the UCI admission and college record database, participants' demographic information, including their sex, age, ethnicity, and parental education level (labeled Parental Education Level) were obtained. Participants provided responses to basic demographic inquiries for their sex (Female = 0; Male = 1), age, and ethnicity (Asian = 1; Hispanic = 2; White = 3; Black = 4; Others = 5). 30.3% of participants identified as male, 68.7% of participants identified as female, and the average age of the participants was 19.93 years ( $SD = 5.04$ ). Regarding racial composition, the participants identified as follows: Asian (46.4%), Hispanic (36.3%), White (12.7%), and Black (2.9%). The largest ethnic group in the sample was Asian participants, constituting 46.4% and serving as the reference group for subsequent analyses.

Regarding Parental Education Level, the highest education attainment level of their parents was surveyed (Junior high/middle school or less = 1; Some high school = 2; High school

graduate/GED = 3; Less than a bachelor's degree (including associate and technical degrees) = 4; Some college = 5; Bachelor's degree = 6; Graduate degree or professional degree = 7). When the educational level of both parents was reported, a higher level of attainment was selected. When the participants reported only one side or were living in single-parent households, the reported values were used. 10.6% of participants reported junior high, middle school, or lower education, 10.0% reported some high school, 17.7% reported high school graduation or GED, 6.1% reported less than a bachelor's degree, 22.8% reported a bachelor's degree, and 18.0% reported a graduate or professional degree. The examined models categorized participants into two groups: those with non-college-educated parents (coded as 0) and those with college-educated parents (coded as 1). This grouping variable was labeled Parental Education Level.

During the second week of the study, participants were presented with a questionnaire regarding their current residential arrangements. Participants who indicated that they commuted from their parents' homes were assigned a code of 0. Those who reported living off-campus were assigned a code of 2. Lastly, participants who indicated that they resided on-campus were assigned a code of 3. The measurement was labeled Residential Situation. 11.1% of the participants lived with their parents, 17.3% commuted from off-campus housings, and 66.3% resided on-campus. Accordingly, on-campus participants were treated as the reference group.

Demographic variables were controlled as covariates in all hypothesis testing.

*Midterm Expectation Accuracy.* Measurement of Midterm Expectation Accuracy involved categorizing participants based on whether their actual midterm scores were lower, same, or higher than their expected scores. One week prior to the midterm examination in their most challenging course of the quarter, participants were asked to report their anticipated midterm score on a numerical scale ranging from 0 to 100 (surveyed between week 5 and week

7). Following the receipt of their actual midterm scores, participants reported their attained scores on the same numerical scale. Participants were classified into three groups depending on whether their actual scores were higher than (coded as 0), the same as (coded as 1), or lower than (coded as 2) their expected scores. 34.7% performed better than expected, 0.04% achieved the expected score, and 34.06% performed worse than expected.

*Score Difference.* To quantify the discrepancy between the expected and actual midterm scores, the Score Difference was calculated by subtracting the actual score from the expected score. This measure was labeled as Score Difference and provided an indication of the magnitude of the deviation.

The score difference exhibited a good distribution with a large variance, ranging from -80.20 to 46.00. This wide range indicates significant individual variations in the accuracy of the midterm examination scores, encompassing instances where the actual score exceeded or fell short of the expected score.

*Goal Adjustment.* The utilization of goal adjustment strategies in response to the midterm scores was assessed using the goal adjustment subscale of the Optimization in Primary and Secondary Control (OPS) scale (Heckhausen et al., 1998; Heckhausen & Tomasik, 2002), modified for college course grade goals. This assessment was administered after participants received their midterm scores from their most challenging courses during the respective week. Participants were presented with the statement, "Thinking about the next exam in your most difficult course, how likely is it that you will:" and provided their responses using a 100-point Likert scale ranging from 1 (Extremely unlikely) to 100 (Extremely likely). The goal adjustment subscale comprised two items: "adjust your grade aspiration for this course" and "become more

realistic in your aspirations for this course." The scores for these items were averaged to yield an overall score indicative of participants' use of goal adjustment strategies.

Scores on the Goal Adjustment scale displayed significant variance and a balanced distribution, rendering them suitable for subsequent regression analyses. The scale exhibited high internal consistency, as evidenced by a Pearson's correlation coefficient of .786 between the two measurement items.

*Support from Peers.* Informational and emotional support from peers within UCI were measured in week 2 and week 6 of the quarter as part of the social belonging assessment in the original study. The week 6 measurement was used in the current study because compared to the week 2 measure, it was considered a more accurate reflection of social support that was available when the students were adjusting goal in response to receiving midterm scores. Participants were asked, "How confident are you that you could:" and answered two items about emotional support (e.g., "Go to another student for emotional support?") and three items about informational support (e.g., "Call another student if you had a question about an assignment?") based on a 100-point Likert scale (1 = Not at all confident; 100 = Extremely confident). The item scores of each subscale were averaged.

Scores on the Peer Emotional Support scale demonstrated significant variance and a balanced distribution, indicating their suitability for subsequent regression analyses. The scale exhibited high internal consistency, as indicated by a Pearson's correlation coefficient of .718 between the two measurement items. Likewise, scores on the Peer Informational Support scale exhibited significant variance and a balanced distribution, with an acceptable Cronbach's alpha coefficient of .733.

*Support from Faculty Members.* Informational and emotional support from faculty members was measured as part of the assessment in which support from peers was measured in the original study. Following the same rationale of using the week 6 measurement of peer support over the week 2 measurement, the week 6 measurement of faculty member support was used in the analysis. Participants were asked, “How comfortable would you feel if you had to” and answered two items about informational support (e.g., “Talk about an academic problem with faculty?”) based on a 100-point Likert scale (1 = Not at all comfortable; 100 = Extremely comfortable). Participants were also asked “How confident are you that a faculty member:” and answered two items about emotional support (e.g., “Would be sympathetic if you were upset?”). Responses were recorded based on a 100-point Likert scale (1 = Not at all confident; 100 = Extremely confident). The item scores in each subscale were averaged.

Scores on the Faculty Member Emotional Support scale demonstrated significant variance and a balanced distribution, making them suitable for further regression analyses. The scale exhibited moderate internal consistency, with a Pearson's correlation coefficient of .696 between the two measurement items. Similarly, scores on the Faculty Member Informational Support scale displayed significant variance and a balanced distribution, with a good Cronbach's alpha coefficient of .812.

*Academic Motivation.* Academic motivation was measured through the selective primary and secondary control subscales (i.e., SPC and SSC) of the Optimization in Primary and Secondary Control (OPS) scale (Heckhausen et al., 1998; Heckhausen & Tomasik, 2002) modified for college course grade goals. Participants were asked, “Thinking about the next exam in your most difficult course, how likely is it that you will:”. The SPC was measured with two items (e.g., “increase your effort and time invested in this course?”), and the SSC was also

measured with two items (e.g., “tell yourself that you will be successful in this course?”) based on a 7-point Likert scale in week 1 and 100-point Likert scale (1 = Extremely unlikely; 100 = Extremely likely) in the week after they received the midterm examination score. The scores were averaged across the subscales to capture the overall motivational commitment. The measurement was conducted in the first (baseline) week and a week after receiving the midterm examination score (post-midterm).

Scores on the Academic Motivation scale exhibited significant variance and a balanced distribution, both at baseline and post-midterm measures, making them suitable for further regression analyses. The scale demonstrated good internal consistency, with a Cronbach's alpha coefficient of .721 for the baseline measure and .816 for the post-midterm measure.

### **Study 2: Plan for Data Analysis**

For Hypothesis 3.1, an ANCOVA was performed to examine the impact of receiving a lower-than-expected score in a difficult course on academic motivation for the course. The Midterm Expectation Accuracy served as the grouping variable, while Academic Motivation (post-midterm) was the outcome variable. Control variables included participants' sex, age, ethnicity, Parental Education Level, and Residential Situation. Additionally, Academic Motivation (baseline) was controlled to account for individual variances.

For Hypothesis 3.2 and Hypothesis 3.3, Ordinary least squares (OLS) regression was utilized to test a moderated regression model. Hypothesis 3.2 was tested by using Goal Adjustment as the predictor, Academic Motivation (post-midterm) as the outcome, and Midterm Examination Result as the categorical moderator variable. Hypothesis 3.3 was tested by a moderated moderation variable that was created by adding Score Difference as a second moderator in the regression model created for Hypothesis 3.2 testing. In all regression models,

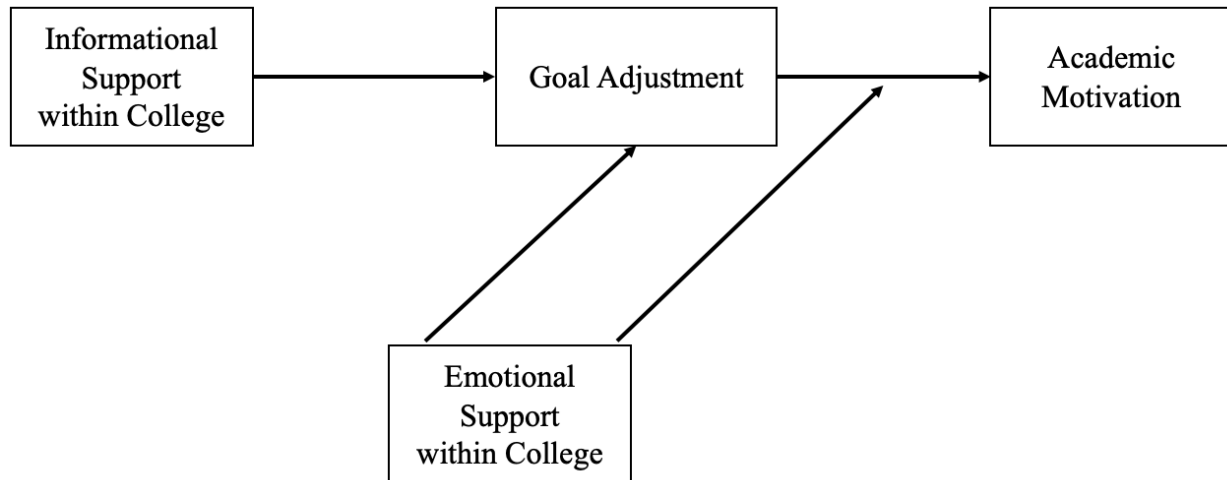
control variables included participants' sex, age, ethnicity, Parental Education Level, Residential Situation, and Academic Motivation (baseline) was controlled to account for individual variances.

For the remaining hypotheses in Study 2, path analyses using structural equation modeling with maximum likelihood estimation were conducted separately on the participants who received lower-than-expected midterm examination scores and the participants whose midterm examination score was same as or higher than their expectation. Four path models in total (model regarding the role of peer support when midterm examination score was lower than expected, model regarding the role of peer support when midterm examination score was the same or higher than expected, model regarding the role of faculty member support when midterm examination score was lower than expected, and model regarding the role of faculty member support when midterm examination score was the same or higher than expected) were created following the theoretical framework of Study 2 (see Figure 4). Model fit indices such as the root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis index (TLI) were examined. The statistical significance of the coefficients representing the predictions in each hypothesis was tested using Bias Corrected Bootstrapping techniques (Preacher & Hayes, 2008). Control variables included participants' sex, age, ethnicity, Parental Education Level, and Academic Motivation (baseline).

All analyses were conducted using IBM SPSS Version 24 and STATA Version 15.0.



**Figure 4**  
*Theoretical Model of Study 2*



*Note.* Within college support includes the support from peers and faculty members.

## **Study 2: Results**

### **Descriptive Analyses**

Correlation analyses are conducted for the variables of central interest in the study and presented in Table 7. There was a positive correlation between Score Difference and Goal Adjustment ( $r = .16, p = .015$ ), supporting the existing literature. A larger score difference indicated a greater need for goal adjustment to establish more realistic goals. This finding aligns with the notion that individuals are more likely to engage in goal adjustment when faced with a significant discrepancy between their current and desired outcomes. Academic Motivation (baseline) exhibited a positive correlation with Goal Adjustment ( $r = .15, p = .022$ ). This finding suggests that participants with higher levels of motivation were more prone to setting unrealistically ambitious goals. Furthermore, a strong correlation was found between Goal Adjustment and Academic Motivation (post-midterm), highlighting the potential benefits of goal adjustment for enhancing motivational self-regulation. Moreover, high intercorrelations were observed among the social support variables. Although not directly within the scope of the

current study, these findings could be associated with prior literature, which has demonstrated that individuals with specific personality traits tend to receive more social support in general (Reevy & Maslach, 2001). Finally, most support variables, except for Peer Emotional Support, displayed positive correlations with Academic Motivation (post-midterm). This suggests that participants who reported higher levels of social support tended to exhibit higher level of academic motivation following the midterm exams.

Multiple ANCOVAs were conducted investigate potential differences in the variables of interest across different ethnic groups. Ethnicity served as the categorical grouping variable, while sex, age, Parental Educational Level, and Residential Situation were utilized as covariates. The analysis revealed no significant differences emerged in Goal Adjustment ( $F(3, 227) = 1.20, p = .322, \eta^2 = .02$ ), Peer Informational Support ( $F(3, 255) = 2.21, p = .087, \eta^2 = .03$ ), Peer Emotional Support ( $F(3, 254) = 1.73, p = .160, \eta^2 = .02$ ), Faculty Member Informational Support ( $F(3, 253) = .50, p = .681, \eta^2 = .01$ ), Faculty Member Emotional Support ( $F(3, 244) = .35, p = .787, \eta^2 = .00$ ), and Academic Motivation (post-midterm, baseline controlled) ( $F(3, 223) = .28, p = .837, \eta^2 = .00$ ) across the participants' ethnic groups.

Likewise, multiple ANCOVAs were conducted with sex as the categorical grouping variable and age, ethnicity, Parental Educational Level, and Residential Situation as covariates, to examine potential differences in the variables of interest associated with participants' sex. The analysis yielded non-significant results for Goal Adjustment ( $F(1, 228) = .06, p = .813, \eta^2 = .00$ ), Peer Informational Support ( $F(1, 256) = .01, p = .927, \eta^2 = .00$ ), Peer Emotional Support ( $F(1, 255) = .02, p = .886, \eta^2 = .00$ ), Faculty Member Informational Support ( $F(1, 254) = .03, p = .863, \eta^2 = .00$ ), Faculty Member Emotional Support ( $F(1, 245) = .05, p = .818, \eta^2 = .00$ ), and

Academic Motivation (post-midterm, baseline controlled) ( $F(1, 224) = .30, p = .583, \eta^2 = .00$ ) between male (coded as 1) and female (coded as 0) participants.

Lastly, multiple ANCOVAs were conducted with Residential Situation the categorical grouping variable and sex, age, ethnicity, and Parental Educational Level to examine potential differences in the variables of interest associated with participants' Residential Situation. Goal Adjustment ( $F(2, 228) = .01, p = .986, \eta^2 = .00$ ), Faculty Member Informational Support ( $F(2, 254) = 1.43, p = .242, \eta^2 = .01$ ), Faculty Member Emotional Support ( $F(2, 245) = .49, p = .611, \eta^2 = .00$ ), and Academic Motivation (post-midterm, baseline controlled) ( $F(2, 224) = .48, p = .622, \eta^2 = .00$ ) did not differ by Residential Situation. Conversely, Peer Informational Support ( $F(2, 256) = 3.62, p = .028, \eta^2 = .03$ ) was higher in “on-campus” group ( $M = 66.91, SD = 27.86$ ) compared to “off-campus” group ( $M = 58.18, SD = 20.94$ ) ( $p = .038$ ). Further, Peer Emotional Support ( $F(2, 255) = 3.48, p = .032, \eta^2 = .03$ ) was higher in “on-campus” group ( $M = 65.09, SD = 30.18$ ) compared to “with parents” group ( $M = 50.11, SD = 28.98$ ) ( $p = .028$ ). Accordingly, Residential Situation was controlled as a covariate in all hypothesis testing models.

Table 6

*Study 2 constructs: sample sizes, ranges, means, standard deviations, and distributions*

Variables	N	%	Min	Max	M	SD	Skewness		Kurtosis	
							Statistic	SE	Statistic	SE
Sex										
Female	222	30.3								
Male	98	68.7								
Missing	3	.1								
Age	320		17.98	64.99	19.93	5.039	5.56	.14	36.77	.27
Ethnicity										
Asian	150	46.4								
Hispanic	114	36.3								
White	40	12.7								
Black	9	2.9								
Others	0	.0								
Parental Education Level										
Non-college-educated	119	34.7								
College-educated	192	60.0								
Missing	12	3.7								
Residential Situation										
With parents	36	11.1								
Off-campus	56	17.3								
On-campus	214	66.3								
Missing	17	5.3								
Midterm Expectation Accuracy										
Better than expected	112	34.7								
Same as expected	12	3.7								
Lower than expected	110	34.1								
Missing	89	27.6								

Score Difference	234	-80.20	46.00	.64	17.10	-.25	.16	1.78	.32
Goal Adjustment	260	.00	100.00	64.29	28.30	-.76	.15	-.19	.30
Academic Motivation (baseline)	308	2.50	7.00	6.04	1.02	-.91	.14	.21	.28
Academic Motivation (post-midterm)	263	.00	100.00	81.72	18.85	-.93	.15	1.65	.30
Peer Informational Support	288	.00	100.00	64.31	28.70	-.65	.14	-.54	.29
Peer Emotional Support	286	.00	100.00	62.07	29.36	-.49	.14	-.80	.29
Faculty Member Informational Support	286	.00	100.00	59.98	26.99	-.49	.14	-.67	.29
Faculty Member Emotional Support	277	.00	100.00	48.32	25.61	-.21	.15	-.78	.29

*Note.* *M* and *SD* represent mean and standard deviation, respectively. The ethnic ( $\chi^2(9) = 12.00, p = .213$ ) and gender ( $\chi^2(1) = 2.00, p = .157$ ) diversity of the sample remained in the study was reflective of the student demographics of UCI freshmen in 2019 (UCI Office of Academic Planning & Institutional Research, n.d.).

Table 7  
*Pearson's correlations between Study 2 constructs*

	1	2	3	4	5	6	7	8
1 Score Difference	1							
2 Goal Adjustment	.16*	1						
3 Peer Informational Support	.07	.24**	1					
4 Peer Emotional Support	.00	.14*	.68**	1				
5 Faculty Member Informational Support	-.03	.11	.38**	.35**	1			
6 Faculty Member Emotional Support	.01	.02	.37**	.41**	.66**	1		
7 Academic Motivation (baseline)	.15*	.05	.02	-.06	.05	-.05	1	
8 Academic Motivation (post-midterm)	.11	.43**	.22**	.12	.29**	.17**	.06	1

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

## Hypothesis testing

**Research question 3:** *When college students receive disappointing performance feedback, does goal adjustment help them maintain their academic motivation?*

*Hypothesis 3.1: A disappointing performance in the midterm exam negatively affects college students' academic motivation.*

To investigate the influence disappointing performance on academic motivation, an ANCOVA was conducted. The categorical independent variable consisted of three groups: 0 = midterm score higher than expected, 1 = midterm score same as expected, and 2 = midterm score lower than expected. Academic Motivation (post-midterm) served as the continuous dependent variable, while sex, age, Parental Education Level, Residential Situation, and Academic Motivation (baseline) were included as covariates. The ANCOVA results indicated a significant difference in Academic Motivation (post-midterm) among the groups ( $F(2, 199) = 3.41, p = .035, \eta^2 = .16$ ) (see Table 8).

Post hoc pairwise comparisons employing Scheffe's procedure were conducted to address the considerable variance in group sizes for comparison. The results revealed that the mean score for Academic Motivation (post-midterm) among participants who received lower-than-expected midterm scores ( $M = 77.67, SD = 1.91$ ) was significantly lower than the mean scores of two other groups. First, in comparison to those who received midterm scores matching their expectations ( $M = 84.08, SD = 5.76$ ), the difference was significant ( $p = .032, 95\% \text{ CI } [.02, 12.84]$ ). Second, in comparison to those who received midterm scores higher than their expectations ( $M = 85.52, SD = 1.92$ ), the difference was also significant ( $p = .015, 95\% \text{ CI } [2.18, 12.51]$ ). It is important to note that the mean parameters were adjusted through covariate control. Conversely, no significant difference in Academic Motivation (post-midterm) was observed

between participants who received the expected score and those who received scores higher than their expectations ( $p = .650$ , 95% CI [-14.21, 17.09]). Based on these results, the Midterm Expectation Accuracy variable was recoded into a binary categorical variable “Midterm Examination Result”, with "succeed" indicating a midterm examination score lower than expectation (coded as 0), and "fail" indicating a midterm examination score higher than expectation (coded as 1).

These findings suggest that students who received lower-than-expected midterm scores encountered greater challenges in maintaining their academic motivation due to the discouragement resulting from their performance falling short of their expectations. Consequently, Hypothesis 3.1 was supported.

Table 8  
*ANCOVA results using Academic Motivation (post-midterm) as the outcome*

Predictor	Sum of Squares	df	Mean Square	F	p
Corrected Model	5335.25	11	485.02	1.32	.216
(Intercept)	18359.62	1	18359.62	49.95	< .001
Male	395.06	1	395.06	1.08	.301
Age	782.13	1	782.13	2.13	.146
Ethnicity					
Hispanic	87.89	1	87.89	.24	.625
White	4.21	1	4.21	.01	.915
Black	28.76	1	28.76	.08	.780
Parental Education Level	562.64	1	562.64	1.51	.217
Residential Situation					
With Parents	224.89	1	224.89	.61	.435
Off-campus	129.94	1	129.94	.35	.553
Academic Motivation (baseline)	5.58	1	5.58	.02	.902
Midterm Examination Result	2509.38	2	1254.69	3.41	.035
Error	73151.50	199	367.595		
Total	1477639.00	211			
Corrected Total	78486.75	210			

Note.  $R^2 = .205$  (Adjusted  $R^2 = .198$ )

*Hypothesis 3.2: Implementing motivational self-regulation strategies of goal adjustment helps college students maintain academic motivation after receiving lower than expected midterm scores.*

To examine Hypothesis 3.3, a moderated ordinary least squares (OLS) regression model was employed. Academic Motivation (post-midterm) served as the outcome variable, while Goal Adjustment was entered as the predictor variable. The Midterm Examination Result, categorized as either "succeed" or "fail," was included as a moderator variable. Additionally, participants' age, sex, ethnicity, Parental Education Level, and Residential Situation were controlled as covariates. To account for individual variations in initial academic motivation and capture the longitudinal nature of the phenomena under investigation, Academic Motivation (baseline) was also controlled. The detailed results can be found in Table 9.

Table 9  
*Coefficients and significances between constructs pertaining to Hypothesis 3.2 testing*

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Outcome:					
Academic Motivation (post-midterm)					
(constant)	73.57	13.18	< .001	47.57	99.57
Goal Adjustment	.04	.13	.780	-.23	.30
Midterm Examination Result	-12.69	6.71	.060	-25.92	.53
Goal Adjustment * Midterm Examination Result	.21	.09	.021	.03	.40
Academic Motivation (Baseline)	-.62	1.18	.602	-2.95	1.72
Male	-2.95	2.65	.266	-8.17	2.27
Age	.36	0.28	.194	-.19	.91
Ethnicity					
Hispanic	-5.13	2.95	.084	-10.95	.69
White	1.33	3.76	.723	-6.08	8.74
Black	5.41	7.8	.489	-9.97	20.78
Parental Education Level	4.09	2.66	.126	-1.16	9.34
Residential Situation					
With parents	-5.13	3.65	.161	-12.33	2.06
Off-campus	-.70	3.51	.843	-7.61	6.22

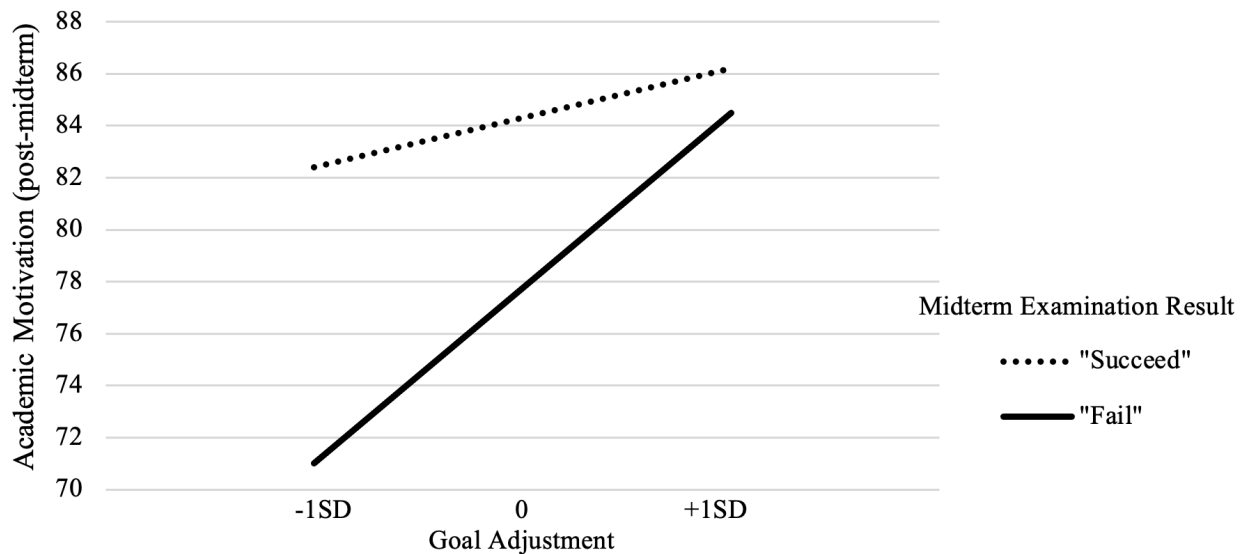
*Note.* LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%).  
Sample size = 207.



The analysis revealed a significant interaction between Goal Adjustment and Midterm Examination Result in predicting Academic Motivation (post-midterm) ( $b = .21, p = .021, 95\% \text{ CI } [.03, .40]$ ). To investigate the conditional effect of the moderator on the association between the predictor and the outcome, two separate OLS regression models were created, examining the relationship between Goal Adjustment and Academic Motivation (post-midterm) based on the categorical value of Midterm Examination Result. The results indicated that the association between Goal Adjustment and Academic Motivation (post-midterm) was more significant only in the "fail" condition ( $b = .25, p < .001, 95\% \text{ CI } [.14, .36]$ ), but not in the "succeed" condition ( $b = .07, p = .598, 95\% \text{ CI } [-.19, .34]$ ). These findings, visually represented in Figure 5, suggested that the use of goal adjustment strategies was particularly beneficial when the feedback from the actual midterm score indicated that participants' initial expectations regarding their academic performance in the course were unrealistically high. Consequently, Hypothesis 3.2 received support.

**Figure 5**

*Conditional effect of Midterm Examination Result on the Association between Goal Adjustment and Academic Motivation*



*Note.* The trends are probed for different values of Midterm Examination Result (Succeed = 0; Fail = 1). Academic Motivation (baseline) was controlled.

*Hypothesis 3.3: The effectiveness of goal adjustment in maintaining academic motivation is more significant when the difference between expected and actual midterm scores is larger.*

Regarding Hypothesis 3.3, which posited that the benefit of goal adjustment in maintaining academic motivation would be greater with larger score differences, a moderated OLS regression model was employed. Academic Motivation (post-midterm) was treated as the outcome variable, while Goal Adjustment served as the predictor variable. The first moderator was Midterm Examination Result (categorical), and the second moderator variable was Score Difference (continuous). Participants' age, sex, ethnicity, Parental Education Level, and Residential Situation were controlled as covariates, along with Academic Motivation (baseline) to account for individual variances and the longitudinal aspect of the phenomena. The results are presented in Table 10.

Table 10  
*Coefficients and significances between constructs pertaining to Hypothesis 3.3 testing*

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Outcome:					
Academic Motivation (post-midterm)					
(constant)	77.46	17.36	< .001	43.21	111.72
Goal Adjustment	-.05	.20	.815	-.44	.35
Midterm Examination Result	-12.7	10.37	.222	-33.17	7.76
Score Difference	.96	.93	.303	-.87	2.78
Goal Adjustment * Midterm Examination Result	.28	.14	.038	.02	.55
Goal Adjustment * Score Difference	-.01	.01	.238	-.04	.01
Midterm Examination Result * Score Difference	-.61	.63	.329	-1.85	.62
Goal Adjustment * Midterm Examination Result * Score Difference	.01	.01	.287	-.01	.02
Academic Motivation (Baseline)	-.60	1.19	.619	-2.95	1.76
Male	-2.98	2.70	.271	-8.31	2.34
Age	.35	.28	.220	-.21	.91
Ethnicity					
Hispanic	-4.94	3.00	.102	-10.87	.99
White	1.97	3.84	.609	-5.60	9.53
Black	4.88	7.87	.536	-10.64	20.39
Parental Education Level	4.01	2.70	.139	-1.31	9.34

Residential Situation					
With parents	-4.79	3.70	.197	-12.09	2.51
Off-campus	-.23	3.57	.948	-7.28	6.81

*Note.* LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%).  
Sample size = 207.

The result showed that no significant interaction was found between Goal Adjustment, Midterm Examination Result, and Score Difference ( $b = .01, p = .287, 95\% \text{ CI } [-.01, .02]$ ). These findings suggest that the extent to which participants benefited from implementing goal adjustment strategies to maintain their academic motivation was not associated with the magnitude of the score difference. In other words, participants who needed to adjust their goals based on the feedback from the midterm exam scores (i.e., the "fail" group) were able to derive benefits from goal adjustment strategies regardless of the initial unrealistic expectations. Thus, Hypothesis 3.3 was not supported.

**Research Question 4.** *Does social support (i.e., emotional and informational) attained within the college context (i.e., peers and faculty members) help college students adjust their academic goals and protect academic motivation against the lower-than-expected performance feedback?*

*Hypothesis 4.1: Peer emotional and informational support positively predicts the use of goal adjustment strategies among college students.*

*Hypothesis 4.2: Peer emotional support positively predicts higher levels of academic motivation after adjusting goal.*

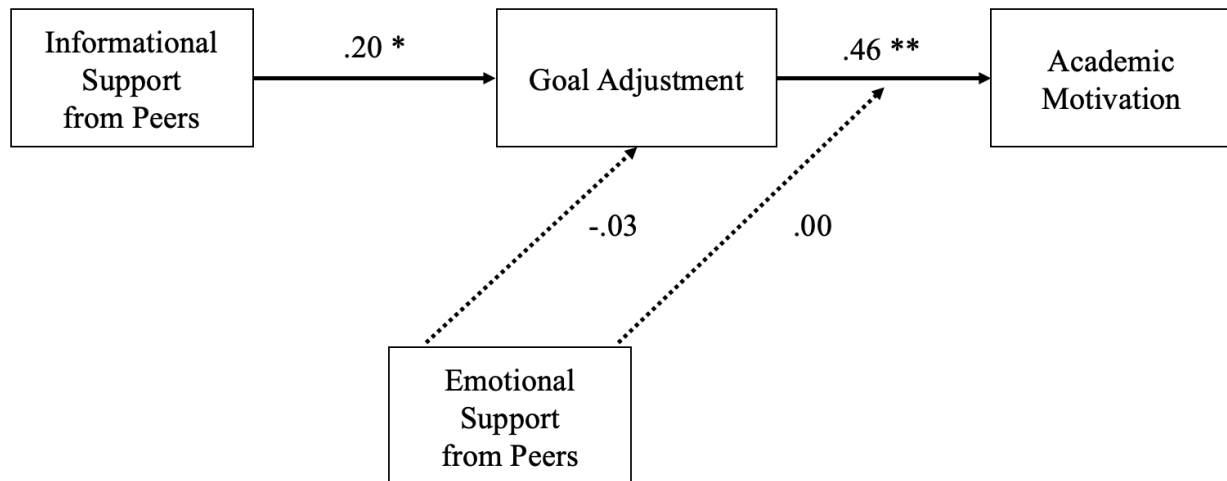
Hypotheses 4.1 and 4.2 were tested using SEM path models following the main theoretical framework of the current research (see Figure 4). Two SEM path models were created and tested for when Midterm Examination Result was "fail" and when Midterm Examination

Result was “succeed”. Both models included sex, age, ethnicity, Parental Education Level, Residential Situation, and Academic Motivation (baseline) as covariates.

In the "fail" condition, the chi-square goodness-of-fit test indicated a good fit,  $\chi^2(11) = 11.62, p = .393$ . To account for the chi-square's sensitivity to sample size, other fit indices were assessed. The comparative fit index (CFI) and the Tucker-Lewis index (TLI) indicated good fit (CFI = .99, TLI = .97). The root mean square error of approximation (RMSEA) was .03 with a 90% confidence interval ranging from .00 to .12, indicating a good fit to the data. Overall, the model fit indices suggested that the hypothesized model provided a good fit to the data. The coefficients and statistical significance of the inter variable associations were showed in Table 11 and Figure 6.

**Figure 6**

*Diagram of Coefficient Parameters and Significances Pertaining to Hypothesis 4.1 and 4.2 testing*



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

Table 11

*Coefficients and significances between constructs pertaining to Hypothesis 4.1 and 4.2 testing*

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Academic Motivation (post-midterm)					
Goal Adjustment	.46	.06	< .001	0.33	.58
Peer Emotioanl Support	.05	.05	.322	-.05	.15
Goal Adjustment * Peer Emotioanl Support	.00	.00	.230	-.00	.01
Academic Motivation (baseline)					
Male	-2.03	1.65	.218	-5.26	1.20
Age	-6.96	3.15	.027	-13.13	-.80
Age	.33	.29	.252	-.24	.91
Ethnicity					
Hispanic	-5.19	3.82	.174	-12.67	2.29
White	-.75	5.17	.885	-10.88	9.38
Black	8.69	9.84	.377	-10.59	27.98
Parental Education Level	6.95	3.53	.049	.03	13.88
Residential Situation					
With parents	-3.64	5.88	.536	-15.18	7.89
Off-campus	3.01	4.15	.467	-5.11	11.14
Goal Adjustment					
Peer Emotioanl Support	-.03	.11	.779	-.24	.18
Peer Informational Support	.20	.10	.020	.04	.37

*Note.* LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%).  
Sample size = 88.

The results indicated that Peer Informational Support significantly predicted a higher level of Goal Adjustment ( $b = .20, p = .020, 95\% \text{ CI } [.04, .37]$ ), which, in turn, predicted a higher level of Academic Motivation (post-midterm) ( $b = .46, p < .001, 95\% \text{ CI } [.33, .58]$ ). This may indicate that peers were one of the critical sources of informational support that helped the participants use goal adjustment strategies. Conversely, the results indicated that Peer Emotional support did not predict a higher level of Goal Adjustment ( $b = -.03, p = .779, 95\% \text{ CI } [-.24, .18]$ ). Thus, Hypothesis 4.1 was only partially supported.

Further, no significant interaction was found between Peer Emotional Support and Academic Motivation (post-midterm) ( $b = .00, p = .230, 95\% \text{ CI } [-.00, .01]$ ), suggesting that

emotional support from peers did not particularly help the participants become motivated with new adjusted goals. Consequently, Therefore, Hypothesis 4.2 was not supported.

In the "succeed" condition, the chi-square goodness-of-fit test indicated a poor fit,  $\chi^2 (11) = 26.23$ ,  $p = .006$ . Moreover, other fit indices suggested poor fit too. The comparative fit index (CFI) and the Tucker-Lewis index (TLI) both indicated inadequate fit (CFI = .42, TLI = .36), which is not acceptable. The root mean square error of approximation (RMSEA) was .11 with a 90% confidence interval ranging from .06 to .17, indicating a poor fit to the data. The second model having a poor fit indicated that the hypothesized model is only applicable in the situation where a downward adjustment was required to deal with unrealistically high academic goals. In other words, the social support from peers benefited the participants only when the participants were in need of lowering their academic goals to maintain their academic motivation.

*Hypothesis 4.3: Faculty members' emotional and informational support positively predicts the use of goal adjustment strategies among college students.*

*Hypothesis 4.4: Faculty members' emotional support positively predicts higher levels of academic motivation after adjusting goal.*

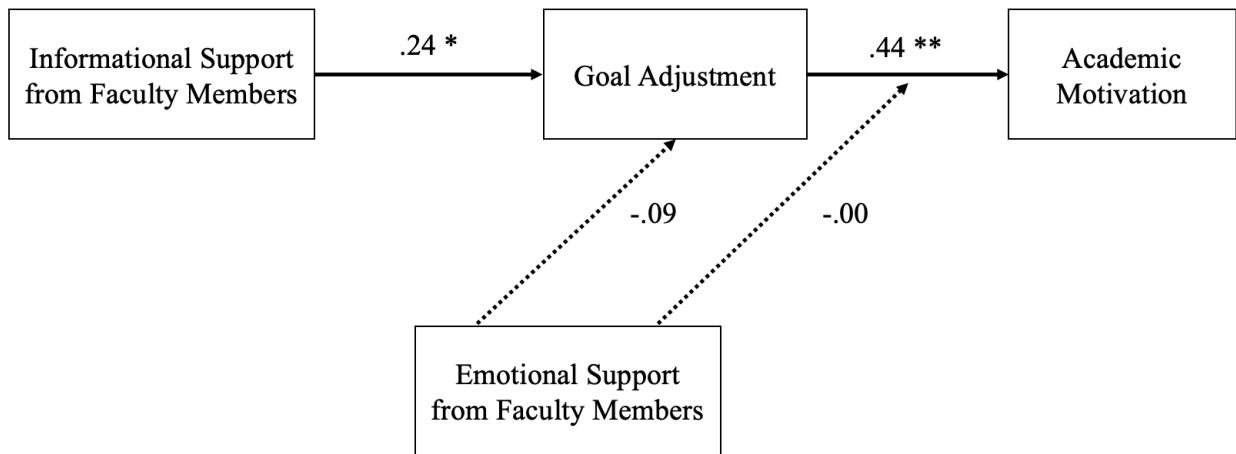
Hypotheses 4.3 and 4.4 were tested using structural equation modeling (SEM) path models, following the main theoretical framework of the current research (see Figure 4). Two SEM path models were created and tested, one for the "fail" condition of Midterm Examination Result and another for the "succeed" condition. Both models included sex, age, ethnicity, Parental Education Level, Residential Situation, and Academic Motivation (baseline) as covariates.

In the first condition when Midterm Examination Result was "fail", the chi-square goodness-of-fit test indicated an acceptable fit,  $\chi^2 (11) = 11.50$ ,  $p = .402$ . Other fit indices were

evaluated to compensate for the chi-square’s sensitivity to sample size. The comparative fit index (CFI) and the Tucker-Lewis index (TLI) both indicated good fit (CFI = .99, TLI = .98). The root mean square error of approximation (RMSEA) was .02 with a 90% confidence interval ranging from .00 to .12, which suggests a good fit to the data. Overall, the model fit indices suggested that the hypothesized model provides a good fit to the data. The coefficients and statistical significance of the associations between variables are presented in Table 12 and Figure 7.

**Figure 7**

*Diagram of Coefficient Parameters and Significances Pertaining to Hypothesis 4.3 and 4.4 Testing*



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

Table 12

*Coefficients and significances between constructs pertaining to Hypothesis 4.3 and 4.4 testing*

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Academic Motivation (post-midterm)					
Goal Adjustment	.44	.06	< .001	.32	.57
Faculty Member Emotioanl Support	.12	.06	.033	.01	.23
* Faculty Member Emotioanl Support	-.00	.00	.145	-.01	.00
Academic Motivation (baseline)					
Male	-1.89	1.54	.222	-4.91	1.14
Female	-6.52	3.05	.033	-12.5	-.54

Age	.27	0.28	.335	-.28	.83
Ethnicity					
Hispanic	-2.31	3.67	.530	-9.5	4.89
White	-1.92	4.92	.697	-11.56	7.73
Black	10.13	9.35	.279	-8.2	28.46
Parental Education Level	9.42	3.49	.007	2.58	16.26
Residential Situation					
With parents	.22	6.14	.971	-11.81	12.25
Off-campus	2.65	4.02	.509	-5.22	10.52
Goal Adjustment					
Faculty Member Emotional Support	-.09	.12	.454	-.33	.15
Faculty Member Informational Support	.24	.11	.031	.02	.44

*Note.* LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%). Sample size = 88.

The results demonstrated that Faculty Member Informational Support significantly predicted a higher level of Goal Adjustment ( $b = .23, p = .031, 95\% \text{ CI } [.02, .44]$ ), which, in turn, predicted a higher level of Academic Motivation (post-midterm) ( $b = .44, p < .001, 95\% \text{ CI } [.32, .57]$ ). This suggested that Faculty Members played a critical role as a source of informational support in facilitating the use of goal adjustment strategies among the participants. Conversely, the results indicated that Faculty Member Emotional Support did not predict a higher level of Goal Adjustment ( $b = -.09, p = .45, 95\% \text{ CI } [-.33, .15]$ ). Therefore, Hypothesis 4.3 was only partially supported.

There was no significant interaction found between Faculty Member Emotional Support and Academic Motivation (post-midterm) ( $b = -.00, p = .145, 95\% \text{ CI } [-.01, .00]$ ), suggesting that emotional support from faculty members did not particularly aid participants in engaging with newly adjusted goals. Consequently, Hypothesis 4.6 was not supported. On the other hand, a positive main effect was found between Faculty Member Emotional Support and Academic Motivation (post-midterm) suggesting that emotional support from faculty members was



beneficial for protecting academic motivation although the influence is irrespective of goal adjustment process ( $b = .12, p = .033, 95\% \text{ CI } [.01, .23]$ ).

In the second condition when Midterm Examination Result was “succeed”, the chi-square indicated a lack of fit,  $\chi^2 (11) = 19.74, p = .049$ . Other fit indices were evaluated to compensate for the chi-square’s sensitivity to sample size. The comparative fit index (CFI) and the Tucker-Lewis index (TLI) both indicated bad fit (CFI = .67, TLI = .24) which were not acceptable. The root mean square error of approximation (RMSEA) was .09 with a 90% confidence interval ranging from .01 to .15, which suggested a poor fit to the data. The second model, which exhibited unacceptable fit, indicated that the hypothesized model is only applicable when downward adjustment of academic goals is required to maintain academic motivation. In other words, the social support from faculty members benefited the participants only when they needed to lower their academic goals to sustain their academic motivation.

## **Study 2: Discussion**

Study 2 examined the role of motivational self-regulation strategies, specifically goal adjustment, in maintaining academic motivation among college students who experienced unexpectedly low academic performance. The study also provided insights into the relationship between the use of goal adjustment strategies and the influence of social support within the school context.

Supporting Hypothesis 3.1, the findings indicated that participants who received lower-than-expected midterm scores exhibited significantly lower levels of Academic Motivation (post-midterm) compared to those who received scores that matched or exceeded their expectations. This suggests that facing lower-than-expected performance can erode students' academic motivation. These results align with prior literature on highlighting the negative impact of

disappointing performance on the ability to sustain motivation (Pulfrey et al, 2011; Chamberlin et al., 2018). The participants who received lower scores may have encountered greater challenges in maintaining their academic motivation due to the discouragement associated with their performance falling short of their expectations.

Furthermore, the findings from the regression analysis provide support for Hypothesis 3.2, revealing a positive association between the implementation of goal adjustment strategies and Academic Motivation (post-midterm), solely for participants who received lower-than-expected midterm scores. Conversely, this association was not observed for those who achieved scores matching or surpassing their expectations. This result suggests that engaging in goal adjustment may serve as a protective mechanism for students facing frustrating academic performance outcomes, specifically when their initial grade expectations were unrealistic. The results confirm the theory of motivational self-regulation which highlight the importance of actively adjusting goals and expectations to maintain motivation, particularly when faced with setbacks (Heckhausen et al., 2019; Wrosch & Scheier, 2020).

On the other hand, the outcomes of the analysis conducted for Hypothesis 3.3 were contrary to the initial expectations. The extent to which participants benefited from adjusting their goals was not predicted by the numeric gap between their expected and actual scores. In other words, regardless of the initial midterm score expectation's realism, it was observed that employing goal adjustment strategies to the same degree resulted in an equivalent maintenance of academic motivation.

The study explored the role of social support within the school context in students' motivational self-regulation involving goal adjustment. Hypothesis 4.1 was partially supported, indicating that peers' informational support predicted a greater use of goal adjustment strategies.

This suggests that receiving informational support from peers may contribute to students' ability to adjust their goals effectively in response to disappointing academic performance. The participants included in this analysis experienced a discrepancy between their initial expectations for their midterm grade and the actual performance. This discrepancy suggests that these individuals may have held relatively high expectations regarding their performance, which subsequently led to feelings of discouragement. Through the informational assistance of supportive friends, they might have gained a more realistic understanding of how other students perform in the course and set more attainable goals. Moreover, it is also likely that peers provided direct instructional support, highlighting the strategic option of lowering their goals as a means of maintaining engagement with the academic course.

On the contrary, the analysis revealed that emotional support from peers did not serve as a predictor for the extent of utilizing goal adjustment strategies in response to receiving lower-than-expected midterm exam scores. Furthermore, contrary to the expectations set in Hypothesis 4.2, no significant interaction emerged between peer emotional support and goal adjustment in predicting academic motivation. These combined results suggest that within the college context, peers may not necessarily play a critical role as a source of emotional support that aids the process of motivational self-regulation for academic goals.

Turning to Hypothesis 4.3, Study 2 examined the influence of faculty members' informational and emotional support on students' adoption of goal adjustment strategies. Similarly to the findings pertaining to peers, the results only partially supported Hypothesis 4.3, indicating that solely the informational support provided by faculty members had a notable impact on increasing the likelihood of students using goal adjustment strategies. In contrast, emotional support from faculty members did not demonstrate a significant effect in this regard.

These findings imply that faculty members' support, in terms of providing relevant information and guidance, can facilitate students' use of goal adjustment strategies. Additionally, it suggests that the measure of emotional support from faculty members employed in the current study may not fully capture whether their support fosters a sense of social acceptance, which, in turn, could facilitate the process of lowering grade aspirations.

Inconsistent with Hypothesis 4.4, no significant interaction was observed between faculty members' emotional support and goal adjustment in predicting academic motivation. Emotional support from faculty members did not significantly contribute to students' transition from disengaging from previous goals to engaging with new adjusted goals.

Overall, the results of this study contribute to the understanding of motivational self-regulation strategies and the role of social support in maintaining academic motivation among college students facing disappointing academic performance. The findings confirm the importance of goal adjustment as an effective strategy for preserving motivation in the face of setbacks (Heckhausen et al., 2019; Wrosch & Scheier, 2020). Moreover, the results underscore the potential influence of informational social support on students' engagement in goal adjustment processes, indicating the close relationship between being provided with information social support and successful motivational self-regulation.

Although emotional support from both peers and faculty members did not exhibit significant effects on goal adjustment, it would be premature to discount the significance of emotional social support in college students' motivational self-regulation for challenging academic goals. Reflecting upon the results of Study 1, it was revealed that emotional parental support remained influential for academic motivation in college, while informational support did not exhibit a similar effect. Conversely, Study 2 revealed that the role of informational support

from college sources in maintaining academic motivation when confronted with discouraging feedback, while emotional support from these same sources played a less critical role in protecting academic motivation. Consequently, it is worthwhile to explore whether the continuity of parental support from high school to college, along with the social support established within the college environment, assumes compensatory interaction in fostering goal adjustment and sustaining academic motivation. Specifically, investigating whether peers and faculty members' informational support promote goal adjustment processes, while parental emotional support facilitates the activation of motivation for adjusted goals, would be valuable. However, the absence of parental support variables in the dataset utilized for Study 2 hindered the analysis of such relationships. Therefore, communication with the Measurement of Undergraduate Success Trajectories (MUST) team facilitated the inclusion of parental variables in the Fall 2021 data collection, with Study 3 focusing on this investigation.

### **Study 3**

#### **Study 3: Participants & Procedure**

Research questions of Study 3 pertain to the potential interaction between parental support and social support within the college environment, in facilitating goal adjustment and sustaining academic motivation among college students. To investigate this matter, the data for Study 3 were procured by engaging with the University of California, Irvine (UCI) Measurement of Undergraduate Success Trajectories (MUST) project team. In response to our request, the UCI MUST project team incorporated survey items pertaining to parental emotional support and parental informational support within their weekly data collection during the Fall 2021 quarter.

In the summer of 2021, all undergraduates at UCI who were about to start their freshman or junior year were invited to participate in the study. The recruited undergraduate students ( $N =$

905) consented to participate and were administered quarterly surveys beginning in the Fall 2021 quarter. Simultaneously, a subsample of participants ( $N = 584$ ) consented to participate in an in-depth version of the study and was administered weekly surveys for an academic year. The weekly surveys consisted of measurements for various domains in their lives, including course-related experiences, social relations, non-academic behaviors, mental health, etc. All surveys were administered online with Qualtrics.

All participants were compensated with \$50 for completing the first quarterly survey and several performance assessments at the beginning of the study. They were compensated with the same amount again after two years. In addition, the subsample of students who participated in weekly surveys received 1 to 2 course credits per quarter.

In the first week of the Fall 2021 quarter, students were asked to report the name of the course in the quarter that was expected to be the most difficult and how many midterm exams were scheduled in the course. Participants who took more than one midterm exam were excluded in the analysis to make their experience consistent in the current study and the remaining sample size was 584. In accordance with the schedule of courses the participants considered the most difficult, they reported their expected scores from the midterm exam and whether the expectation was met.

By the end of the quarter (week 10), 403 participants remained in the study. To assess the differences in participant characteristics between those who dropped out or had incomplete data and those who provided complete data throughout the study duration, attrition analyses were conducted. The results of these analyses revealed that no demographic characteristics demonstrate varying rates of participant attrition.

### Study 3: Measures

Study 3 measurement items are included in Appendix.

*Demographics.* Through access to the administrative data from the UCI admission and college record database, participants' demographic information, including their sex, age, ethnicity, and parental education level (labeled Parental Education Level) were obtained. Participants provided responses to basic demographic inquiries for their sex (Female = 0; Male = 1), age, and ethnicity (Asian = 1; Hispanic = 2; White = 3; Black = 4; Others = 5). 25.5% of participants identified as male, 56.5% of participants identified as female, and the average age of the participants was 19.58 ( $SD = 3.51$ ). Regarding racial composition, the participants identified as follows: Asian (41.3%), Hispanic (25.3%), White (11.0%), and Black (80.8%). The largest ethnic group in the sample was Asian participants, constituting 41.3% and serving as the reference group for subsequent analyses.

Regarding Parental education Level, the highest education attainment level of their parents was surveyed (Junior high/middle school or less = 1; Some high school = 2; High school graduate/GED = 3; Less than a bachelor's degree (including associate and technical degrees) = 4; Some college = 5; Bachelor's degree = 6; Graduate degree or professional degree = 7). When the educational level of both parents was reported, a higher level of attainment was selected. When the participants reported only one side or were living in single-parent households, the reported values were used. 5.1% of participants reported junior high, middle school, or lower education, 6.8% reported some high school, 13.7% reported high school graduation or GED, 9.9% reported some college, 5.3% reported less than a bachelor's degree, 18.7% reported a bachelor's degree, and 20.7% reported a graduate or professional degree. The examined models categorized participants into two groups: those with non-college-educated parents (coded as 0) and those

with college-educated parents (coded as 1). This grouping variable was labeled Parental Education Level.

During the second week of the study, participants were presented with a questionnaire regarding their current residential arrangements. Participants who indicated that they commuted from their parents' homes were assigned a code of 0. Those who reported living off-campus were assigned a code of 2. Lastly, participants who indicated that they resided on-campus were assigned a code of 3. The measurement was labeled Residential Situation. 15.2% of the participants lived with their parents, 14.0% commuted from off-campus housings, and 44.0% resided on-campus. Accordingly, on-campus participants were treated as the reference group.

Demographic variables were controlled as covariates in all hypothesis testing.

*Midterm Expectation Accuracy.* Measurement of Midterm Expectation Accuracy involved categorizing participants based on whether their actual midterm scores were lower, same, or higher than their expected scores. One week prior to the midterm examination in their most challenging course of the quarter, participants were asked to report their anticipated midterm score on a numerical scale ranging from 1 to 13 (1 = F; 2 = D-; 3 = D; 4 = D+; 5 = C-; 6 = C; 7 = C+; 8 = B-; 9 = B; 10 = B+; 11 = A; 12 = A-; 13 = A+) (surveyed between week 5 and week 7). Following the receipt of their actual midterm scores, participants reported their attained scores on the same numerical scale. Participants were classified into three groups depending on whether their actual scores were higher than (coded as 0), the same as (coded as 1), or lower than (coded as 2) their expected scores. 14.6% performed better than expected, 11.0% achieved the expected score, and 24.8% performed worse than expected.

*Score Difference.* To quantify the discrepancy between the expected and actual midterm scores, the Score Difference was calculated by subtracting the actual score from the expected



score. This measure was labeled as Score Difference and provided an indication of the magnitude of the deviation.

The score difference exhibited a good distribution with a large variance, ranging from -9.20 to 12.00. This wide range indicates significant individual variations in the accuracy of the midterm examination scores, encompassing instances where the actual score exceeded or fell short of the expected score.

*Goal Adjustment.* The utilization of goal adjustment strategies in response to the midterm scores was assessed using the goal adjustment subscale of the Optimization in Primary and Secondary Control (OPS) scale (Heckhausen et al., 1998; Heckhausen & Tomasik, 2002), modified for college course grade goals. This assessment was administered after participants received their midterm scores from their most challenging courses during the respective week. Participants were presented with the statement, "Thinking about the next exam in your most difficult course, how likely is it that you will:" and provided their responses using a 7-point Likert scale ranging from 1 (Extremely unlikely) to 7 (Extremely likely). The goal adjustment subscale comprised two items: "adjust your grade aspiration for this course" and "become more realistic in your aspirations for this course." The scores for these items were averaged to yield an overall score indicative of participants' use of goal adjustment strategies.

Scores on the Goal Adjustment scale displayed significant variance and a balanced distribution, rendering them suitable for subsequent regression analyses. The scale exhibited high internal consistency, as evidenced by a Pearson's correlation coefficient of .786 between the two measurement items.

*Support from Parents.* Informational and emotional parental support was measured with the items used in Study 1 which were modified for the UCI MUST project context. In the first

week of 2021 Fall quarter, Participants answered two items on parental emotional support (e.g. “How many times during the past 6 months have your parent(s)/ guardian(s): Told you that you are OK just the way you are”) and two items on parental informational support (e.g. “How many times during the past 6 months have your parent(s)/ guardian(s): Given you advice about your schoolwork”) on a 5-point Likert scale (0 = Never; 1 = Once or twice; 2 = About once a month; 3 = Twice a month; 4 = Almost every week; 5 = More than once a week). Items scores in each subscale were averaged.

Scores on the Parental Emotional Support scale demonstrated significant variance and a balanced distribution, indicating their suitability for subsequent regression analyses. The scale exhibited acceptable internal consistency, as evidenced by a Pearson's correlation coefficient of .679 between Parental Emotional Support items and .760 between Parental Informational Support items.

*Support from Peers.* Informational and emotional support from peers within UCI were measured in week 2 and week 6 of the quarter as part of the social belonging assessment in the original study. The week 6 measurement was used in the current study because compared to the week 2 measure, it was considered a more accurate reflection of social support that was available when the students were adjusting their course grade goals in response to receiving midterm scores. Participants were asked, “How confident are you that you could:” and answered two items about emotional support (e.g., “Go to another student for emotional support?”) and three items about informational support (e.g., “Call another student if you had a question about an assignment?”) based on a 100-point Likert scale (1 = Not at all confident; 100 = Extremely confident). The item scores of each subscale were averaged.

Scores on the Peer Emotional Support scale demonstrated significant variance and a balanced distribution, indicating their suitability for subsequent regression analyses. The scale exhibited acceptable internal consistency, as indicated by a Pearson's correlation coefficient of .680 between the two measurement items. Likewise, scores on the Peer Informational Support scale exhibited significant variance and a balanced distribution, with a Cronbach's alpha coefficient of .797.

*Support from Faculty Members.* Informational and emotional support from faculty members was measured as part of the assessment in which support from peers was measured in the original study. Following the same rationale of using the week 6 measurement of peer support over the week 2 measurement, the week 6 measurement of faculty member support was used in the analysis. Participants were asked, "How comfortable would you feel if you had to" and answered two items about informational support (e.g., "Talk about an academic problem with faculty?") based on a 100-point Likert scale (1 = Not at all comfortable; 100 = Extremely comfortable). Participants were also asked "How confident are you that a faculty member:" and answered two items about emotional support (e.g., "Would be sympathetic if you were upset?"). Responses were recorded based on a 100-point Likert scale (1 = Not at all confident; 100 = Extremely confident). The item scores in each subscale were averaged.

Scores on the Faculty Member Emotional Support scale demonstrated significant variance and a balanced distribution, making them suitable for further regression analyses. The scale exhibited acceptable internal consistency, with a Pearson's correlation coefficient of .622 between the two measurement items. Similarly, scores on the Faculty Member Informational Support scale displayed significant variance and a balanced distribution, with a Cronbach's alpha coefficient of .871.

*Academic Motivation.* Academic motivation was measured through the selective control subscales (i.e., SPC and SSC) of the Optimization in Primary and Secondary Control (OPS) scale (Heckhausen et al., 1998; Heckhausen & Tomasik, 2002) modified for college course grade goals. Participants were asked, “Thinking about the next exam in your most difficult course, how likely is it that you will:”. The SPC was measured with two items (e.g., “increase your effort and time invested in this course?”), and the SSC was also measured with two items (e.g., “tell yourself that you will be successful in this course?”) based on a 7-point Likert scale in week 1 and in the week after they received the midterm examination score. The scores were averaged across the subscales to capture the overall motivational commitment. The measurement was conducted in the first (baseline) week and a week after receiving the midterm examination score (post-midterm).

Scores on the Academic Motivation scale exhibited significant variance and a balanced distribution, both at baseline and post-midterm measures, making them suitable for further regression analyses. The scale demonstrated high internal consistency, with a Cronbach's alpha coefficient of .823 for the baseline measure and .872 for the post-midterm measure.

### **Study 3: Plan for Data Analysis**

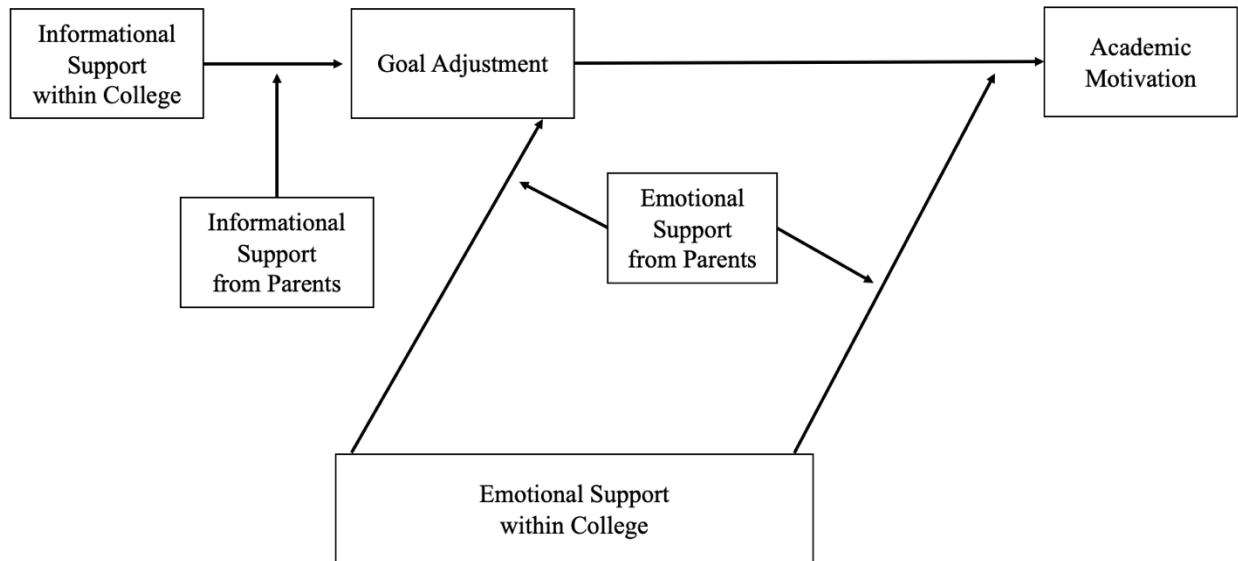
To ensure that the participants in Study 3 were facing similar challenges in academic goal pursuit as in Study 2, the replication of Hypothesis 3.1 and Hypothesis 3.2 from Study 1 was tested. An ANCOVA was conducted to examine whether receiving a lower-than-expected midterm exam score had a negative impact on participants' academic motivation. Midterm Expectation Accuracy was entered as a categorical variable, and Academic Motivation (post-midterm) was the outcome variable. Covariates included participants' sex, age, ethnicity, Parental Education Level, Residential Situation, and Academic Motivation (baseline).

Next, a moderated ordinary least squares (OLS) regression model was used to test whether Score Difference played a role in differentiating the effectiveness of Goal Adjustment in maintaining academic motivation when the midterm score was lower than expected. Goal Adjustment served as the predictor, Academic Motivation (post-midterm) as the outcome, and Score Difference as the moderator variable. Control variables included participants' sex, age, ethnicity, Parental Education Level, Residential Situation, and Academic Motivation (baseline).

For hypotheses testing in Study 3, multiple path analyses using structural equation modeling with maximum likelihood estimation were conducted separately on the participants who received lower-than-expected midterm examination scores and the participants whose midterm examination score was same as or higher than their expectation. The path models were constructed to incorporate the variables of interest and the interaction terms implied in the moderation hypotheses. Covariates, such as participants' sex, age, ethnicity, Parental Education Level, Residential Situation, and Academic Motivation (baseline) were included. Model fit indices, including root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis index (TLI), were assessed. The statistical significance of the coefficients representing the predictions in each hypothesis was tested using Bias Corrected Bootstrapping techniques (Preacher & Hayes, 2008). Path models created for Research Question 5 followed the theoretical framework proposed for Study 2 (see Figure 4) and path models created for Research Question 6 followed the main theoretical framework of Study 3 (see Figure 8). Finally, the primary theoretical framework was employed to examine the exploratory hypothesis concerning the potential compensatory effect within the college context, wherein the absence of social support from one source may be offset by support from another source.

All analyses were conducted using IBM SPSS Version 24 and STATA Version 15.0.

**Figure 8**  
*Theoretical Model of Study 3*



*Note.* Within college support includes the support from peers and faculty members.

### **Study 3: Results**

#### **Descriptive Analyses**

Correlation analyses are conducted for the variables of central interest in the study and presented in Table 14. Academic Motivation (baseline) showed a positive correlation with Goal Adjustment ( $r = .53, p < .001$ ), suggesting that participants who were more motivated tended to be unrealistically ambitious. Peer Emotional Support ( $r = .15, p = .013$ ) and Peer Informational Support ( $r = .19, p = .001$ ) were found to predict a higher likelihood of using goal adjustment strategies. These results justify further investigation into the relationship between social support and goal adjustment. Additionally, a strong correlation was found between Goal Adjustment and Academic Motivation (post-midterm). This suggests that goal adjustment may have a beneficial effect on motivational self-regulation, particularly in the context of academic pursuits. Study 3 also revealed a high intercorrelation between social support variables, consistent with the

findings from Study 2. Finally, while Academic Motivation (baseline) and Academic Motivation (post-midterm) were correlated with some social support variables, no clear pattern emerged from these correlation analyses alone. Further exploration is needed to better understand the complex relationship between academic motivation and social support.

Multiple ANCOVAs were conducted to investigate potential differences in the variables of interest across different ethnic groups. Ethnicity served as the categorical grouping variable, while sex, age, Parental Educational Level, and Residential Situation were utilized as covariates. The analysis revealed no significant differences emerged in Goal Adjustment ( $F(3, 222) = 1.41, p = .240, \eta^2 = .02$ ), Parental Informational Support ( $F(3, 384) = 1.39, p = .245, \eta^2 = .01$ ), Parental Emotional Support ( $F(3, 384) = 2.54, p = .057, \eta^2 = .03$ ), Peer Informational Support ( $F(3, 295) = 2.62, p = .051, \eta^2 = .03$ ), Peer Emotional Support ( $F(3, 300) = 2.38, p = .071, \eta^2 = .03$ ), Faculty Member Informational Support ( $F(3, 291) = .76, p = .518, \eta^2 = .01$ ), Faculty Member Emotional Support ( $F(3, 282) = .21, p = .887, \eta^2 = .02$ ), and Academic Motivation (post-midterm, baseline controlled) ( $F(3, 220) = .88, p = .454, \eta^2 = .01$ ) across the participants' ethnic groups.

Likewise, multiple ANCOVAs were conducted with sex as the categorical grouping variable and age, ethnicity, Parental Educational Level, and Residential Situation as covariates, to examine potential differences in the variables of interest associated with participants' sex. The analysis yielded non-significant results for Goal Adjustment ( $F(1, 223) = .53, p = .467, \eta^2 = .00$ ), Parental Informational Support ( $F(1, 386) = 1.78, p = .183, \eta^2 = .01$ ), Parental Emotional Support ( $F(1, 386) = 1.93, p = .166, \eta^2 = .01$ ), Peer Informational Support ( $F(1, 297) = .09, p = .769, \eta^2 = .00$ ), Peer Emotional Support ( $F(1, 302) = 1.20, p = .275, \eta^2 = .00$ ), Faculty Member Informational Support ( $F(1, 293) = .19, p = .666, \eta^2 = .00$ ), Faculty Member Emotional Support ( $F(1, 284) = .36, p = .547, \eta^2 = .00$ ), and Academic Motivation (post-midterm) (controlling for

Academic Motivation at baseline) ( $F(1, 221) = .00, p = .973, \eta^2 = .00$ ) between male (coded as 1) and female (coded as 0) participants.

Similarly, multiple ANCOVAs were conducted with Parental Education Level as the categorical grouping variable, and sex, age, ethnicity, and Residential Situation as covariates, to explore potential differences in parental support based on the educational attainment of parents. The results indicated that there were no significant differences found in Parental Informational Support ( $F(1, 386) = 3.51, p = .062, \eta^2 = .01$ ) and Parental Emotional Support ( $F(1, 386) = 2.94, p = .087, \eta^2 = .01$ ) based on whether the participants' parents had received college-level education.

Lastly, multiple ANCOVAs were conducted with Residential Situation as the categorical grouping variable, and sex, age, ethnicity, and Parental Education Level as covariates, to explore potential differences in parental support based on the Residential Situation. Results showed no difference of Goal Adjustment ( $F(2, 223) = 2.87, p = .059, \eta^2 = .02$ ), Parental Informational Support ( $F(2, 386) = .61, p = .542, \eta^2 = .00$ ), Parental Emotional Support ( $F(2, 386) = 1.34, p = .264, \eta^2 = .00$ ), Peer Informational Support ( $F(2, 297) = 1.99, p = .138, \eta^2 = .01$ ), Faculty Member Informational Support ( $F(2, 293) = 1.94, p = .146, \eta^2 = .00$ ), and Academic Motivation (post-midterm, baseline controlled) ( $F(2, 221) = 2.95, p = .055, \eta^2 = .03$ ) associated with Residential Situation. On the other hand, Peer Emotional Support ( $F(2, 302) = 8.42, p < .001, \eta^2 = .05$ ) was higher in “on-campus” group ( $M = 62.88, SD = 24.80$ ) compared to “with parents” group ( $M = 47.45, SD = 29.36$ ) ( $p = .001$ ). Further, Faculty Member Emotional Support ( $F(2, 284) = 5.87, p = .003, \eta^2 = .04$ ) was higher in “on-campus” group ( $M = 55.42, SD = 20.52$ ) compared to “off-campus” group ( $M = 48.42, SD = 24.25$ ) ( $p = .007$ ). Accordingly, Residential Situation was controlled as a covariate in all hypothesis testing models.



Table 13

*Study 3 constructs: sample sizes, ranges, means, standard deviations, and distributions*

Variables	<i>N</i>	%	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	Skewness		Kurtosis	
							Statistic	SE	Statistic	SE
Sex										
Female	330	56.5								
Male	149	25.5								
Missing	105	18.0								
Age	486		16.07	64.08	19.58	3.51	7.52	.11	74.21	.22
Ethnicity										
Asian	241	41.3								
Hispanic	148	25.3								
White	64	11.0								
Black	17	80.0								
Others	0	.0								
Parental Education Level										
Non-college-educated	150	25.7								
College-educated	319	54.6								
missing	115	20.0								
Residential Situation										
With parents	89	15.2								
Off-campus	82	14.0								
On-campus	257	44.0								
Missing	156	26.7								
Midterm Expectation Accuracy										
Better than expected	85	14.6								
Same as expected	64	11.0								
Lower than expected	145	24.8								
Missing	294	50.4								

Score Difference	294	-9.00	12.00	1.2	3.29	.38	.14	.45	.28
Goal Adjustment	316	1.00	7.00	4.72	1.73	-.67	.14	-.33	.27
Academic Motivation (baseline)	429	2.50	7.00	6.10	.91	-.99	.12	.76	.24
Academic Motivation (post-midterm)	316	1.00	7.00	5.67	1.38	-.87	.14	1.21	.27
Parental Informational Support	426	.00	5.00	2.39	1.51	.06	.12	-1.06	.24
Parental Emotional Support	426	.00	6.00	2.82	1.73	-.16	.12	-1.35	.24
Peer Informational Support	422	.00	100.00	59.64	27.17	-.58	.12	-.42	.24
Peer Emotional Support	424	.00	100.00	57.20	27.37	-.32	.12	-.65	.24
Faculty Member Informational Support	417	.00	100.00	60.63	23.87	-.60	.12	.16	.24
Faculty Member Emotional Support	409	.00	100.00	53.13	22.43	-.20	.12	-.07	.24

*Note.* *M* and *SD* represent mean and standard deviation, respectively. The ethnic ( $\chi^2(9) = 11.09, p = .270$ ) and gender ( $\chi^2(1) = 2.77, p = .096$ ) diversity of the sample remained in the study was reflective of the student demographics of UCI freshmen in 2021 (UCI Office of Academic Planning & Institutional Research, n.d.)

Table 14

*Pearson's correlations between Study 3 constructs*

	1	2	3	4	5	6	7	8	9	10
1 Score Difference	1									
2 Goal Adjustment	.07	1								
3 Parental Informational Support	.02	.12	1							
4 Parental Emotional Support	.06	.06	.51**	1						
5 Peer Informational Support	.01	.19**	.22**	.11*	1					
6 Peer Emotional Support	-.02	.15*	.21**	.18**	.70**	1				
7 Faculty Member Informational Support	-.04	.03	.06	.07	.41**	.40**	1			
8 Faculty Member Emotional Support	-.06	.02	.18**	.17**	.40**	.45**	.65**	1		
9 Academic Motivation (baseline)	.15*	.25**	.04	.10*	.12*	.05	.22**	.14*	1	
10 Academic Motivation (post-midterm)	.11	.46**	.12	.10	.24**	.11	.14*	.10	.43**	1

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

**Replication of Study 2 Results.** An ANCOVA was conducted to examine the relationship between three groups based on midterm scores (0 = higher than expected, 1 = same as expected, 2 = lower than expected) as the independent variable and the post-midterm Academic Motivation score as the dependent variable. Covariates included participants' sex, age, Parental Education Level, Residential Situation, and baseline measure of Academic Motivation. The ANCOVA revealed a significant difference in Academic Motivation across the groups ( $F(2, 201) = 3.23, p = .042, \eta^2 = .08$ ) (see Table 15).

Table 15  
*ANCOVA results using Academic Motivation (post-midterm) as the outcome*

Predictor	Sum of Squares	df	Mean Square	F	p
Corrected Model	92.44	11	8.40	5.75	< .001
(Intercept)	9.97	1	9.97	6.82	.010
Male	.27	1	.27	.19	.667
Age	4.98	1	4.98	3.41	.066
Ethnicity					
Hispanic	.03	1	.03	.02	.885
White	.31	1	.31	.21	.644
Black	3.13	1	3.13	2.14	.145
Parental Education Level	.20	1	.20	.13	.715
Residential Situation					
With Parents	3.50	1	3.50	2.40	.123
Off-campus	3.72	1	3.72	2.54	.112
Academic Motivation (baseline)	76.03	1	76.03	52.02	< .001
Midterm Expectation Accuracy	4.77	2	4.77	3.23	.042
Error	293.77	201	1.46		
Total	7374.00	213			
Corrected Total	386.21	212			

Note.  $R^2 = .239$  (Adjusted  $R^2 = .198$ )

Post hoc pairwise comparisons using Scheffe's procedure were employed due to the considerable variance in group sizes. The mean post-midterm Academic Motivation score of participants who received a lower-than-expected midterm score ( $M = 5.49, SD = 1.37$ ) was

significantly lower than the mean score of those who received the midterm score as expected ( $M = 5.84$ ,  $SD = 1.19$ ) ( $p = .030$ , 95% CI [.00, .70]). Additionally, the mean score of those who received a higher-than-expected midterm score ( $M = 5.86$ ,  $SD = 1.43$ ) was significantly higher than the mean score of those who received the score as expected ( $p = .021$ , 95% CI [.01, .76]). There were no significant differences between the groups who received the score as expected and the groups who received a higher-than-expected score ( $p = .747$ , 95% CI [-9.10, 9.14]). These findings suggest that participants who received lower-than-expected midterm scores faced greater challenges in maintaining their academic motivation compared to the other groups, which aligns with the results of Study 2. Consequently, the Midterm Expectation Accuracy Score variable was recoded into a binary categorical variable "Midterm Examination Result": "succeed" (midterm score lower than expectation, coded as 0) and "fail" (midterm score higher than expectation, coded as 1).

To assess the effectiveness of goal adjustment strategies identified in Study 2, an ordinary least squares (OLS) regression model was employed. Academic Motivation (post-midterm) served as the outcome variable, Goal Adjustment as the predictor variable, and Midterm Examination Result as the moderator variable. Covariates included participants' sex, age, ethnicity, Parental Education Level, Residential Situation, and baseline Academic Motivation. The results demonstrated a positive association between Goal Adjustment and Academic Motivation (post-midterm) ( $b = .26$ ,  $p < .001$ , 95% CI [.14, .39]), replicating the beneficial impact of goal adjustment strategies on maintaining academic motivation, as observed in Study 2 (see Table 16).

Table 16

*Coefficients and significances between constructs pertaining to replicating Hypothesis 3.2 with Study 3 dataset*

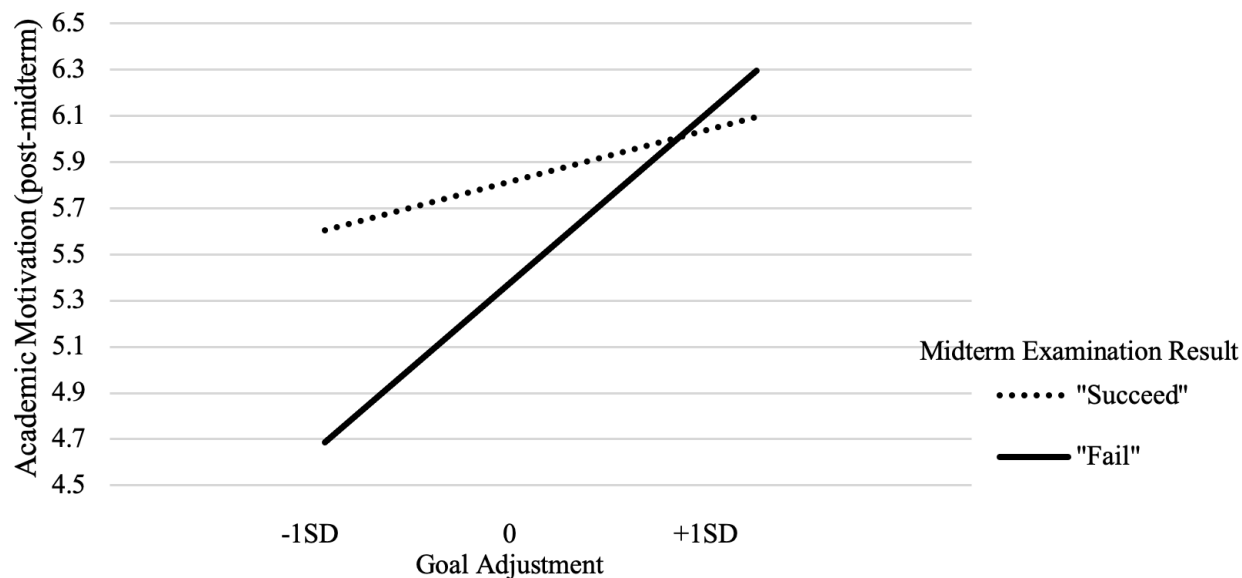
	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Outcome:					
Academic Motivation (post-midterm)					
(constant)	2.19	.80	.007	.61	3.76
Goal Adjustment	.26	.06	< .001	.14	.39
Midterm Examination Result	-1.09	.46	.019	-1.99	-.18
Goal Adjustment * Midterm Examination Result	.18	.09	.046	.00	.36
Academic Motivation (Baseline)	.52	.09	< .001	.33	.70
Male	.24	.16	.141	-.08	.56
Age	-.05	.03	.106	-.11	.01
Ethnicity					
Hispanic	-.02	.20	.910	-.42	.38
White	.26	.23	.268	-.20	.72
Black	.47	.40	.242	-.32	1.26
Parental Education Level	-.07	.19	.717	-.44	.30
Residential Situation					
With parents	.20	.20	.297	-.18	.59
Off-campus	.34	.23	.132	-.10	.79

*Note.* LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%).  
Sample size = 213.

To further explore the significant interaction found between Goal Adjustment and Midterm Examination Result ( $b = .18, p = .019, 95\% \text{ CI} [-1.99, -.18]$ ), two separate OLS regression models were developed, examining the association between Goal Adjustment and Academic Motivation (post-midterm) based on the categorical value of Midterm Examination Result. The results indicated that the relationship between Goal Adjustment and Academic Motivation (post-midterm) was only significant in the "fail" condition ( $b = .44, p < .001, 95\% \text{ CI} [.30, .58]$ ) but not in the "succeed" condition ( $b = .14, p = .598, 95\% \text{ CI} [-.39, .67]$ ). These findings, depicted in Figure 9, suggested that goal adjustment strategies were particularly advantageous when participants' initial expectations regarding their academic performance in the course were unrealistically high.

**Figure 9**

*Conditional Effect of Midterm Examination Result on the Association between Goal Adjustment and Academic Motivation*



*Note.* The trends are probed for different values of Midterm Examination Result (Succeed = 0; Fail = 1). Academic Motivation (baseline) was controlled.

Score Difference was included as a second moderator in the regression model to investigate whether participants benefited more from goal adjustment when the midterm exam score expectation was more unrealistic. The results are described in Table 17 and indicated that the interaction between Goal Adjustment, Midterm Examination Result, and Score Difference did not reach statistical significance in predicting Academic Motivation (post-midterm) ( $b = -.00$ ,  $p = .952$ , 95% CI [-.09, .08]), matching the findings in Study 2.

Table 17

*Coefficients and significances between constructs pertaining to replicating Hypothesis 3.3 with Study 3 dataset*

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Outcome:					
Academic Motivation (post-midterm)					
(constant)	2.68	.85	.002	1.00	4.36
Goal Adjustment	.23	.07	.002	.09	.37
Midterm Examination Result	-1.85	.63	.004	-3.09	-.61
Score Difference	.20	.18	.285	-.16	.56

Goal Adjustment * Midterm Examination Result	.29	.13	.025	.04	.55
Goal Adjustment * Score Difference	-.03	.03	.344	-.10	.03
Midterm Examination Result * Score Difference	.05	.24	.834	-.41	.51
Goal Adjustment * Midterm Examination Result * Score Difference	-.00	.04	.925	-.09	.08
Academic Motivation (Baseline)	.50	.09	< .001	.32	.68
Male	.20	.16	.226	-.12	.52
Age	-.06	.03	.062	-.12	.00
Ethnicity					
Hispanic	-.03	.20	.872	-.43	.37
White	.29	.24	.222	-.18	.76
Black	.47	.40	.239	-.32	1.26
Parental Education Level	-.10	.19	.599	-.49	.28
Residential Situation					
With parents	.17	.20	.390	-.22	.56
Off-campus	.40	.23	.082	-.05	.85

*Note.* LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%). Sample size = 213.

In summary, the findings suggest that using in goal adjustment strategies may assist students in maintaining their academic motivation in the face of disappointing performance outcomes, regardless of the initial realism of their expectations. The replication of the results from Study 2 supports the progression to hypothesis testing in Study 3.

### **Hypothesis testing**

**Research Question 5:** *Does social support (i.e., emotional and informational) from parents help college students adjust their academic goals and protect academic motivation against the lower-than-expected performance feedback?*

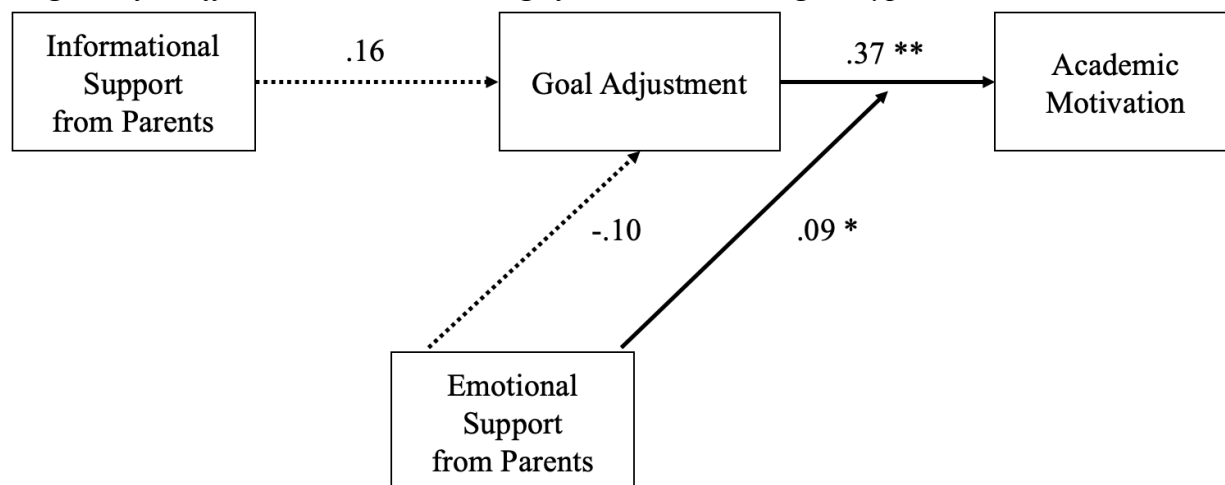
To address Research Question 5, two structural equation modeling (SEM) path models were employed, utilizing Parental Emotional Support and Parental Informational Support as predictor variables, based on the theoretical framework proposed for Study 2 (see Figure 4). The first model examined the participants in the "fail" condition, while the second model focused on those in the "succeed" condition. Both models incorporated covariates such as participants' sex,

age, ethnicity, Parental Educational Level, Score Difference, Residential Situation, and Academic Motivation (baseline).

For the first model, representing the "fail" group, the chi-square test indicated an acceptable goodness-of-fit ( $\chi^2 (11) = 17.31, p = .099$ ). Moreover, both the comparative fit index (CFI = .92) and the Tucker-Lewis index (TLI = .91) indicated an acceptable fit. The root mean square error of approximation (RMSEA) was 0.06, with a 90% confidence interval ranging from 0.01 to 0.11, which suggested an acceptable fit to the data. Overall, the model fit indices supported the notion that the proposed model adequately fits the data. The results are displayed in Figure 10 and Table 18.

**Figure 10**

*Diagram of Coefficient Parameters and Significances Pertaining to Hypothesis 5.1 and 5.2 Testing*



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

Table 18

*Coefficients and significances between constructs pertaining to Hypothesis 5.1 and 5.2 testing*

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Academic Motivation (post-midterm)					
Goal Adjustment	.37	.07	< .001	.23	.51
Parental Emotional Support	.05	.07	.432	-.08	.19
Goal Adjustment * Parental Emotional Support	.09	.04	.018	.02	.17



Academic Motivation (baseline)	.48	.14	.001	.21	.75
Male	.31	.24	.196	-.16	.77
Age	.04	.05	.428	-.06	.15
Ethnicity					
Hispanic	-.14	.28	.626	-.68	.41
White	.09	.32	.783	-.54	.72
Black	.29	.50	.564	-.70	1.27
Parental Education Level	.12	.29	.675	-.45	.69
Residential Situation					
With parents	.21	.27	.435	-.31	.73
Off-campus	.52	.35	.142	-.17	1.21
Goal Adjustment					
Parental Emotional Support	-.10	.11	.339	-.31	.11
Parental Informational Support	.16	.13	.227	-.10	.41

*Note.* LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%).  
Sample size = 100.

*Hypothesis 5.1: Parental emotional and informational support positively predicts the use of goal adjustment strategies among college students.*

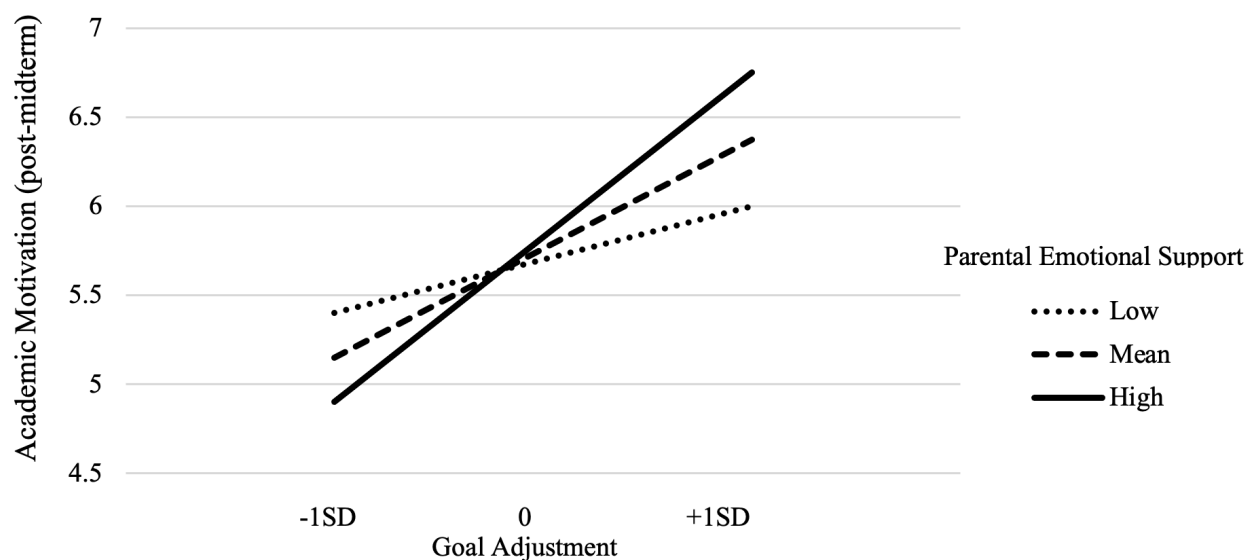
*Hypothesis 5.2: Parental emotional support positively predicts higher levels of academic motivation after adjusting goal.*

The results revealed that Parental Informational Support did not significantly predict the level of Goal Adjustment ( $b = .16, p = .227, 95\% \text{ CI } [-.10, .41]$ ). Similarly, the results demonstrated that Parental Emotional Support did not significantly predict the level of Goal Adjustment ( $b = -.10, p = .339, 95\% \text{ CI } [-.31, .11]$ ), indicating that Hypothesis 5.1 was not supported. While a significant association emerged between Goal Adjustment and Academic Motivation (post-midterm), indicating the effectiveness of employing goal adjustment strategies ( $b = .37, p < .001, 95\% \text{ CI } [.23, .51]$ ), the extent to which participants employed goal adjustment strategies was not influenced by the informational or emotional support received from their parents.

The results indicated a significant interaction between Parental Emotional Support and Goal Adjustment in predicting Academic Motivation (post-midterm) ( $b = .09, p = .018, 95\% \text{ CI } [.02, .17]$ ). To analyze the interaction pattern, an examination of how the association between Goal Adjustment and Academic Motivation (post-midterm) varied based on the conditional values of Parental Emotional Support (i.e., -1SD, mean, +1SD) was conducted. The findings revealed that Goal Adjustment predicted Academic Motivation (post-midterm) when Parental Emotional Support was moderate (mean) ( $b = .37, p < .001, 95\% \text{ CI } [.22, .52]$ ) or high (+1SD) ( $b = .53, p < .001, 95\% \text{ CI } [.34, .71]$ ). Conversely, when Parental Emotional Support was low (-1SD), Goal Adjustment did not predict Academic Motivation (post-midterm) ( $b = .21, p = .072, 95\% \text{ CI } [-.02, .44]$ ). These results indicate that effectively reengaging with adjusted academic goals after downward adjustment is more likely when participants receive greater emotional support from their parents (see Figure 11). Therefore, Hypothesis 5.2 was supported.

**Figure 11**

*Conditional Effect of Parental Emotional Support on the Association between Goal Adjustment and Academic Motivation*



*Note.* The trends are probed for different values of Parental Emotional Support (-1SD, mean, +1SD). Academic Motivation (baseline) was controlled.

In the "succeed" condition, the chi-square test indicated a lack of fit between the model and the observed data,  $\chi^2(11) = 40.88, p < .001$ . Moreover, other fit indices, such as the comparative fit index (CFI = .66) and the Tucker-Lewis index (TLI = .23), indicated inadequate fit, which is deemed unacceptable. The root mean square error of approximation (RMSEA) was .14, with a 90% confidence interval ranging from .10 to .19, indicating poor fit to the data. These results demonstrate that the hypothesized model is only applicable when downward adjustment of academic goals is required to maintain academic motivation.

**Research Question 6:** *When college students are in need of adjusting goal to maintain academic motivation but are lacking support within college context to help them adjust goal, does parental support serve a compensatory function?*

To address Research Question 6, multiple structural equation modeling (SEM) path models were utilized. The purpose of Model 1 was to replicate the association between peer support and motivational self-regulation observed in Study 2 for the "fail" group in Study 3 data. Model 2 aimed to examine the absence of such association in the "succeed" condition. Model 3 investigated the interaction between Parental Informational Support, Peer Informational Support, Parental Emotional Support, and Peer Emotional Support for the participants in the "fail" condition. Model 4 tested the applicability of the previous model for the participants in the "succeed" group.

Similarly, Model 5 replicated the association between faculty member support and motivational self-regulation observed in Study 2 for the "fail" group in Study 3 data, while Model 6 explored the absence of this association in the "succeed" condition. Model 7 examined the interaction between Parental Informational Support, Faculty Member Informational Support, Parental Emotional Support, and Faculty Member Emotional Support for the participants in the

"fail" condition. Finally, Model 8 investigated the applicability of the previous model for the participants in the "succeed" group.

In summary, Models 1, 2, 5, and 6 aimed to replicate Study 2 results and establish a basis for hypothesis testing related to Research Question 6. Models 3, 4, 7, and 8 were used for hypothesis testing. Covariates such as participants' sex, age, ethnicity, Parental Educational Level, Score Difference, Residential Situation, and Academic Motivation (baseline) were included in all models.

*Hypothesis 6.1: Parents' informational support and peer informational support demonstrate a compensatory interaction in predicting a greater use of goal adjustment strategies.*

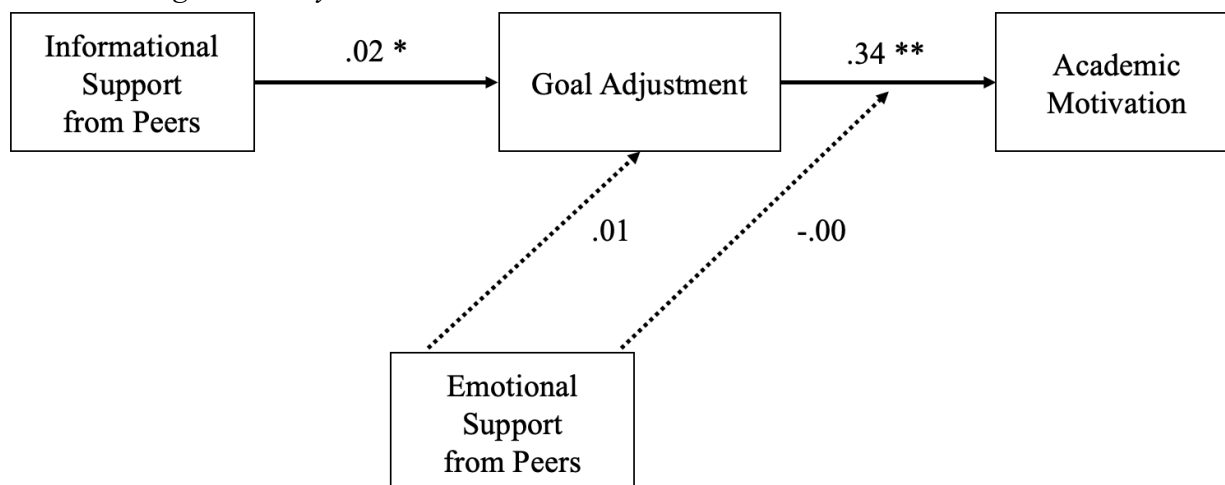
*Hypothesis 6.2: Parents' emotional support and peer emotional support demonstrate a compensatory interaction in predicting a greater use of goal adjustment strategies.*

*Hypothesis 6.3: Parents' emotional support and peer emotional support demonstrate a compensatory interaction in predicting higher levels of academic motivation after adjusting goal.*

Model 1 demonstrated an acceptable fit ( $\chi^2(11) = 14.67, p = .198$ ; CFI = 0.92; TLI = 0.90; RMSEA = 0.06, 90% CI [.00, .13]). Peer Informational Support positively predicted the use of goal adjustment strategies, consistent with the findings from Study 2 ( $b = .02, p = .048$ , 95% CI [.00, .03]) (see Figure 12 and Table 19).

**Figure 12**

Diagram of Coefficient Parameters and Significances Pertaining to Replicating Hypothesis 4.1 and 4.2 testing with Study 3 Dataset



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

Table 19

Coefficients and significances between constructs pertaining to replicating Hypothesis 4.1 and 4.2 testing with Study 3 Dataset

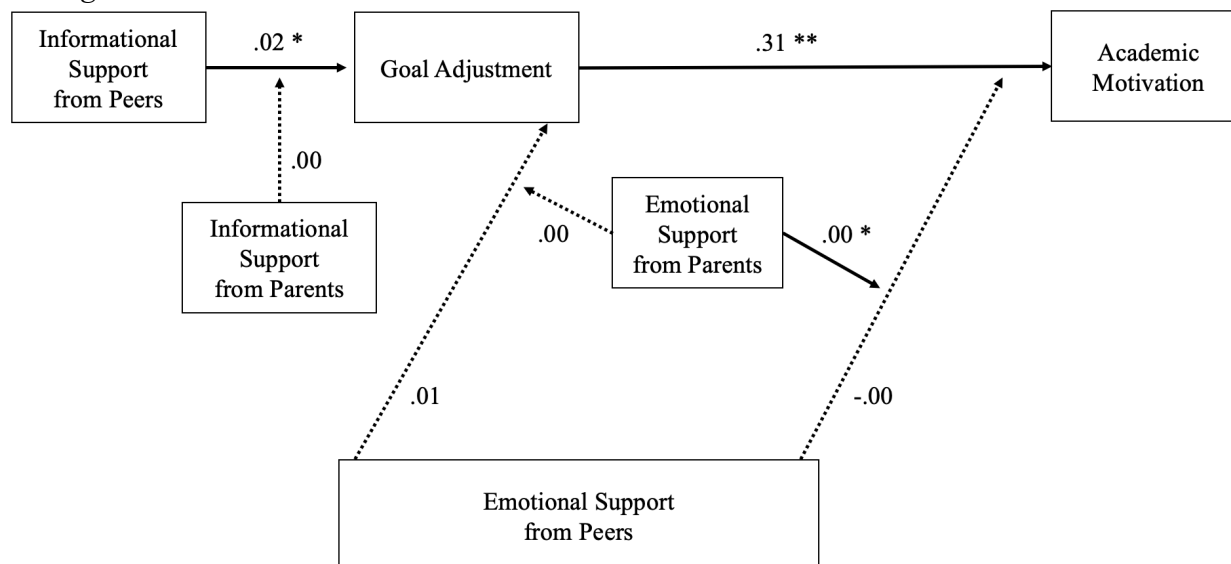
	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Academic Motivation (post-midterm)					
Goal Adjustment	.34	0.08	< .001	.19	.50
Peer Emotional Support	-.00	.00	.586	-.01	.01
Goal Adjustment * Peer Emotional Support	-.00	.00	.251	-.01	.00
Academic Motivation (baseline)	.52	.14	< .001	.25	.79
Male	.27	.25	.275	-.21	.75
Age	.02	.09	.798	-.16	.20
Ethnicity					
Hispanic	.04	.32	.893	-.58	.67
White	.06	.32	.860	-.57	.68
Black	.37	.58	.516	-.75	1.50
Parental Education Level	.35	.30	.245	-.24	.95
Residential Situation					
With parents	.14	.29	.628	-.42	.70
Off-campus	.53	.37	.148	-.19	1.24
Goal Adjustment					
Peer Emotional Support	.01	.01	.448	-.01	.02
Peer Informational Support	.02	.01	.048	.00	.03

Note. LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%). Sample size = 90.

Model 2 exhibited a poor fit, suggesting that the proposed model is applicable only when participants receive unexpectedly low exam scores and need to lower their goals to maintain academic motivation ( $\chi^2 (11) = 55.37, p < .001$ ; CFI = .55; TLI = .34; RMSEA = .19, 90% CI [.14, .24]). The results from Model 1 and Model 3 allowed for the progression to Model 3 testing.

In Model 3, the chi-square test indicated an acceptable fit ( $\chi^2 (15) = 21.49, p = .122$ ). The comparative fit index (CFI = .91) and the Tucker-Lewis index (TLI = .91) both indicated an acceptable fit. The root mean square error of approximation (RMSEA) was .06, with a 90% confidence interval ranging from .00 to .13, indicating an acceptable fit to the data. Overall, the model fit indices supported the notion that the proposed model adequately fits the data. The results are presented in Figure 13 and Table 20.

**Figure 13**  
*Coefficients and Significances between Constructs Pertaining to Hypothesis 6.1, 6.2, and 6.3 Testing*



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

Table 20  
Coefficients and significances between constructs pertaining to Hypothesis 6.1, 6.2, and 6.3 testing

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Academic Motivation (post-midterm)					
Goal Adjustment	.31	.08	< .001	.16	.47
Parental Emotioanl Support	.10	.07	.199	-.05	.24
Peer Emotioanl Support	-.00	.00	.391	-.01	.00
Goal Adjustment * Parental Emotioanl Support	.10	.05	.045	.00	.21
Goal Adjustment * Peer Emotioanl Support	-.00	.00	.081	-.01	.00
Parental Emotioanl Support * Peer Emotional Support	-.00	.00	.274	-.01	.00
Goal Adjustment * Parental Emotioanl Support * Peer Emotioanl Support	.00	.00	.049	.00	.01
Academic Motivation (baseline)	.47	.14	.001	.20	.73
Male	.25	.24	.293	-.21	.71
Age	.02	.09	.827	-.15	.19
Ethnicity					
Hispanic	-.10	.32	.757	-.72	.52
White	.10	.31	.735	-.50	.70
Black	.15	.55	.790	-.94	1.23
Parental Education Level	.21	.31	.498	-.39	.81
Residential Situation					
With parents	.30	.28	.287	-.25	.85
Off-campus	.53	.35	.137	-.17	1.22
Goal Adjustment					
Parental Emotioanl Support	-.09	.11	.389	-.30	.12
Peer Emotional Support	.01	.01	.303	-.01	.02
Parental Emotioanl Support * Peer Emotional Support	.00	.00	.341	-.00	0.01
Parental Informational Support	-.09	.14	.511	-.37	.18
Peer Informational Support	.02	.01	.036	.01	.04
Parental Informational Support * Peer Informational Support	.00	.00	.675	-.01	.01

Note. LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%). Sample size = 90.

Although the results showed that Peer Informational Support significantly predicted the use of goal adjustment strategies, ( $b = .02, p = .036, 95\% \text{ CI } [.01, .04]$ ), no significant interaction was found between Parental Informational Support and Peer Informational Support in predicting Goal Adjustment ( $b = .00, p = .675, 95\% \text{ CI } [-.01, .01]$ ). Thus, Hypothesis 6.1 was not

supported. Similarly, there was no significant interaction between Parental Emotional Support and Peer Emotional Support in predicting Goal Adjustment ( $b = .00, p = .341, 95\% \text{ CI } [-.00, .01]$ ). Therefore, Hypothesis 6.2 was not supported. These results suggest that when college students face difficulties in adjusting their goals due to a lack of peer support, receiving a high level of informational or emotional support from parents does not offer significant assistance. These findings align with the Study 1 results, which indicated that informational support from parents may not be relevant to academic motivation in college.

Goal Adjustment was found to positively predict Academic Motivation (post-midterm) consistently across various models tested in the current study ( $b = .31, p < .001, 95\% \text{ CI } [.16, .47]$ ), supporting the effectiveness of goal adjustment strategies. Among the tested interaction terms, a significant two-way interaction was observed between Goal Adjustment and Parental Emotional Support in predicting Academic Motivation (post-midterm) ( $b = .10, p = .045, 95\% \text{ CI } [.00, .21]$ ), aligning with Hypothesis 5.3.

Furthermore, a significant three-way interaction was found between Goal Adjustment, Parental Emotional Support, and Peer Emotional Support in predicting Academic Motivation (post-midterm) ( $b = .00, p = .049, 95\% \text{ CI } [.00, .01]$ ). To analyze the interaction pattern and explore whether parental emotional support compensated for the lack of peer support in promoting academic motivation, the association between Goal Adjustment and Academic Motivation (post-midterm) was examined across three conditional values of Parental Emotional Support (i.e., -1SD, mean, +1SD) and two conditional values of Peer Emotional Support (i.e., above mean, below mean) (see Figure 14).

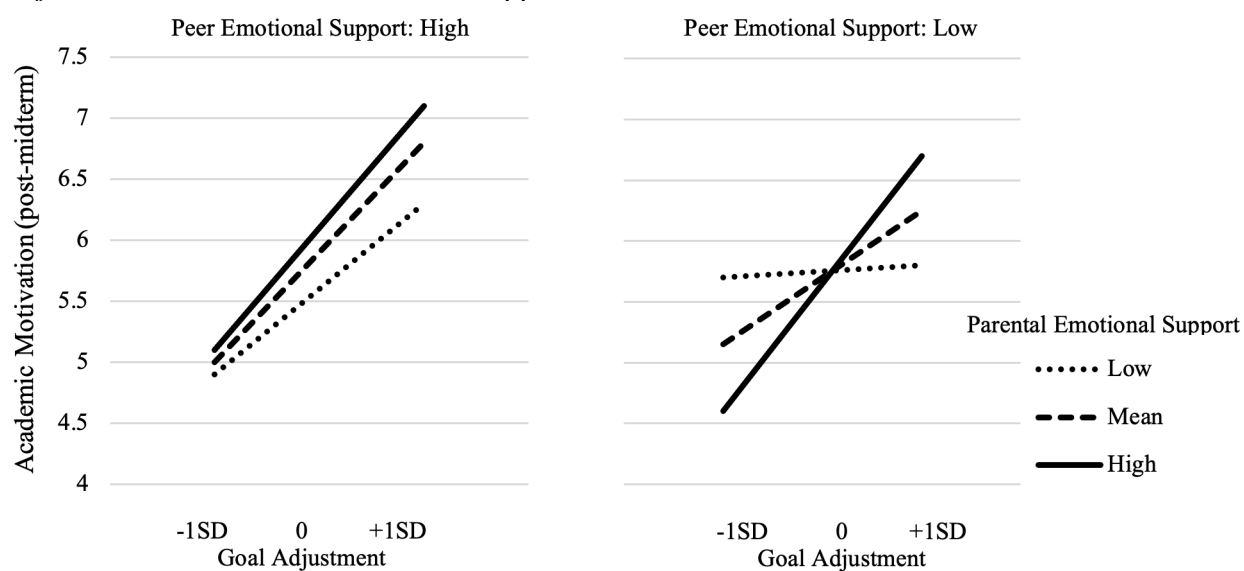
When Peer Emotional Support was high, Goal Adjustment positively predicted Academic Motivation (post-midterm) regardless of the level of Parental Emotional Support. (-1SD:  $b = .41,$



$p = .021$ , 95% CI [.07, .76]; mean:  $b = .50$ ,  $p < .001$ , 95% CI [.25, .75]; +1SD:  $b = .59$ ,  $p = .001$ , 95% CI [.26, .92]). When Peer Emotional Support was low, Goal Adjustment positively predicted Academic Motivation (post-midterm) when Parental Emotional Support was moderate (mean) ( $b = .34$ ,  $p = .002$ , 95% CI [.13, .55]) and high (+1SD) ( $b = .62$ ,  $p < .001$ , 95% CI [.38, .86]). On the other hand, when Parental Emotional Support was low (-1SD), Goal Adjustment did not predict Academic Motivation (post-midterm) ( $b = .06$ ,  $p = .711$ , 95% CI [-.25, .37]). In other words, when participants lacked emotional support from peers, receiving a high level of emotional support from parents instead helped them become motivated with the adjusted academic goal after using goal adjustment strategies, playing a compensatory role. Therefore, Hypothesis 6.3 was supported.

**Figure 14**

*Conditional Effect of Parents' and Peers' Emotional Support on the Association between Goal Adjustment and Parental Emotional Support*



Note. Academic Motivation (baseline) was controlled.

Model 4 exhibited a poor fit, indicating that the proposed model is applicable only when participants receive lower-than-expected low exam scores thus signaled of the need to adjust their goals ( $\chi^2 (15) = 62.47, p < .001$ ; CFI = .54; TLI = .26; RMSEA = .16, 90% CI [.12, .21]).

*Hypothesis 6.4: Parents' informational support and faculty members' informational support demonstrate a compensatory interaction in predicting a greater use of goal adjustment strategies.*

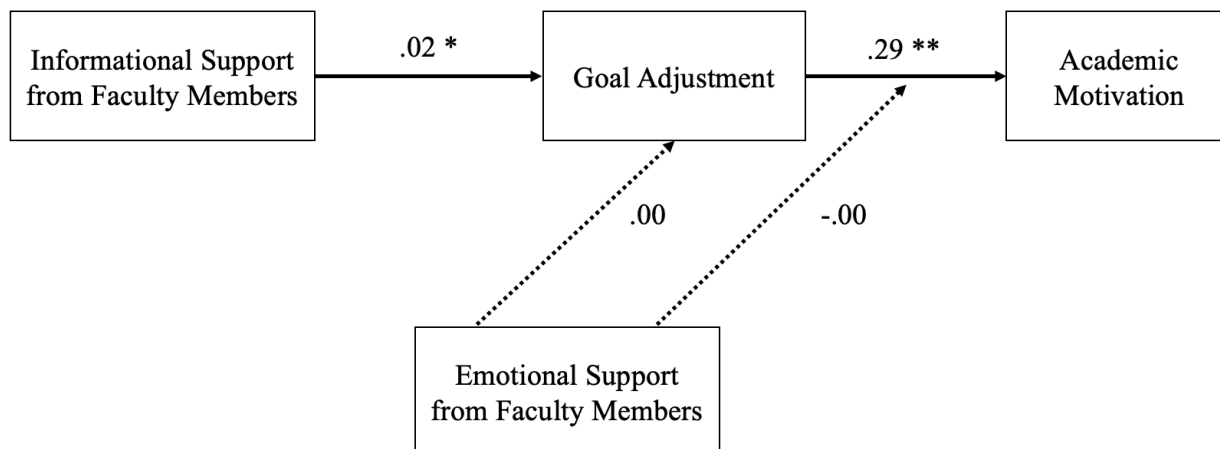
*Hypothesis 6.5: Parents' emotional support and faculty members' emotional support demonstrate a compensatory interaction in predicting a greater use of goal adjustment strategies.*

*Hypothesis 6.6: Parents' emotional support and faculty members' emotional support demonstrate a compensatory interaction in predicting higher levels of academic motivation after conducting goal adjustment.*

Model 5 demonstrated a good fit ( $\chi^2 (11) = 10.16, p = .516$ ). Both the comparative fit index (CFI = .97) and the Tucker-Lewis index (TLI = .96) indicated a good fit. The root mean square error of approximation (RMSEA) was .02, with a 90% confidence interval ranging from .00 to .11, suggesting an acceptable fit to the data. Overall, the model fit indices supported the notion that the proposed model adequately fits the data. The results are presented in Figure 15 and Table 21.

**Figure 15**

Diagram of Coefficient Parameters and Significances Pertaining to Replicating Hypothesis 4.3 and 4.4 testing with Study 3 Dataset



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

Table 21

Coefficients and significances between constructs pertaining to replicating Hypothesis 4.3 and 4.4 testing with Study 3 dataset

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Academic Motivation (post-midterm)					
Goal Adjustment	.29	.08	< .001	.13	.45
Faculty Member Emotional Support	.01	.01	.061	-.00	.02
Goal Adjustment					
* Faculty Member Emotional Support	-.00	.00	.306	-.01	.00
Academic Motivation (baseline)	.42	.15	.006	.12	.71
Male	.26	.26	.317	-.25	.77
Age	-.01	.06	.912	-.12	.10
Ethnicity					
Hispanic	.08	.30	.800	-.51	.66
White	.32	.35	.363	-.37	1.01
Black	.77	.60	.197	-.40	1.94
Parental Education Level	.10	.32	.763	-.53	.72
Residential Situation					
With parents	.36	.31	.243	-.25	.97
Off-campus	.67	.39	.085	-.09	1.43
Goal Adjustment					
Faculty Member Emotional Support	.00	.01	.975	-.02	.02
Faculty Member Informational Support	.02	.01	.045	.00	.03

Note. LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%). Sample size = 83.

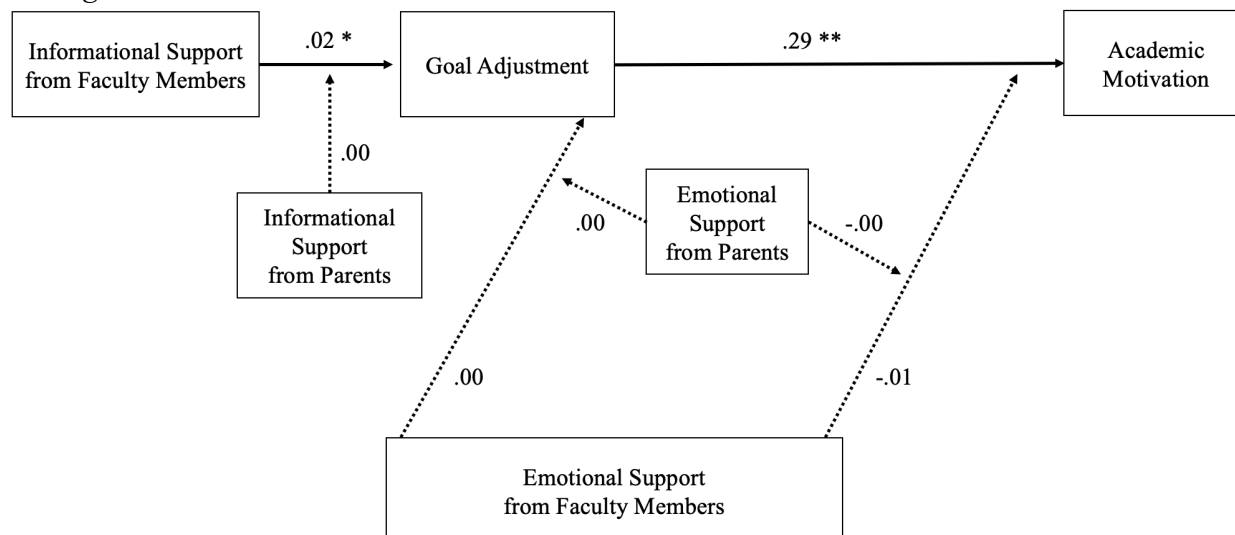
The results replicated the Study 2 findings regarding the significant association between Goal Adjustment and Academic Motivation (post-midterm) ( $b = .29, p < .001, 95\% \text{ CI } [.13, .45]$ ), as well as between Faculty Member Informational Support and Goal Adjustment ( $b = .02, p = .045, 95\% \text{ CI } [.00, .03]$ ).

Model 6 exhibited a poor fit, suggesting that the proposed model is applicable only when participants receive unexpectedly low exam scores and need to lower their goals to maintain academic motivation ( $\chi^2 (11) = 39.10, p < .001; \text{CFI} = .64; \text{TLI} = .18; \text{RMSEA} = .15, 90\% \text{ CI } [.10, .21]$ ). The results from Model 5 and Model 6 allowed for the progression to Model 7 testing.

In Model 7, the chi-square test indicated an acceptable goodness-of-fit ( $\chi^2 (15) = 20.55, p = .152$ ). Both the comparative fit index ( $\text{CFI} = .91$ ) and the Tucker-Lewis index ( $\text{TLI} = .90$ ) indicated an acceptable fit. The root mean square error of approximation ( $\text{RMSEA}$ ) was 0.04, with a 90% confidence interval ranging from 0.00 to 0.12, indicating an acceptable fit to the data. Overall, the model fit indices suggested that the hypothesized model provides an acceptable fit to the data. The results are presented in Figure 16 and Table 22.

**Figure 16**

Diagram of Coefficient Parameters and Significances Pertaining to Hypothesis 6.4, 6.5, and 6.6 Testing



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

Table 22

Coefficients and significances between constructs pertaining to Hypothesis 6.4, 6.5, and 6.6 testing

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Academic Motivation (post-midterm)					
Goal Adjustment	.29	.09	.001	.12	.47
Parental Emotional Support	.13	.08	.107	-.03	.28
Faculty Member Emotional Support	.01	.01	.137	-.00	.02
Goal Adjustment * Parental Emotional Support	.06	.06	.283	-.05	.17
Goal Adjustment * Faculty Member Emotional Support	-.01	.00	.100	-.01	.00
Parental Emotional Support * Faculty Member Emotional Support	.00	.00	.125	-.00	.01
Goal Adjustment * Parental Emotional Support * Faculty Member Emotional Support	-.00	.00	.303	-.01	.01
Academic Motivation (baseline)	.43	.15	.003	.15	0.72
Male	.30	.25	.229	-.19	.79
Age	.04	.06	.459	-.07	.15
Ethnicity					
Hispanic	.03	.30	.933	-.57	.62
White	.16	.34	.650	-.52	.83
Black	.57	.58	.323	-.56	1.7
Parental Education Level	.08	.32	.805	-.55	.71

Residential Situation					
With parents	.25	.31	.406	-.35	.86
Off-campus	.60	.38	.110	-.14	1.35
Goal Adjustment					
Parental Emotional Support	-.05	.12	.663	-.28	.18
Faculty Member Emotional Support	.00	.01	.857	-.02	.02
Parental Emotional Support	.00	.00	.517	-.01	.01
* Faculty Member Emotional Support					
Parental Informational Support	.02	.14	.906	-.26	.29
Faculty Member Informational Support	.02	.01	.043	.00	.04
Parental Informational Support	.00	.01	.563	-.01	.01
* Faculty Member Informational Support					

*Note.* LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%). Sample size = 83.

Consistent with the Study 2 results and Model 5 testing, Faculty Member Informational Support positively predicted the use of Goal Adjustment Strategies ( $b = .02, p = .043, 95\% \text{ CI } [.00, .04]$ ).

There was no significant interaction found between Parental Informational Support and Faculty Member Informational Support ( $b = .00, p = .563, 95\% \text{ CI } [-.01, .01]$ ), and between Parental Emotional Support and Faculty Member Emotional Support, when predicting Goal Adjustment ( $b = .00, p = .517, 95\% \text{ CI } [-.01, .01]$ ). Therefore, Hypothesis 6.4 and Hypothesis 6.5 were not supported. Further, there was no significant interaction found between Goal Adjustment, Parental Emotional Support, and Faculty Member Emotional Support ( $b = -.00, p = .303, 95\% \text{ CI } [-.01, .00]$ ). Thus, Hypothesis 6.6 was not supported. These results indicate that, although faculty members' informational support may assist participants in using goal adjustment strategies when required, there was no compensatory or additive relationship between Parental Emotional Support and Faculty Member Emotional Support in the process of goal adjustment or reengaging with the adjusted goals.

Model 8 exhibited a poor fit, suggesting that the proposed model is applicable only when participants receive unexpectedly low exam scores and need to lower their goals to maintain academic motivation ( $\chi^2 (15) = 43.93, p < .001$ ; CFI = .69; TLI = .24; RMSEA = .13, 90% CI [.09, .18]).

*Exploratory Hypothesis: When college students are in need of conducting goal adjustment to maintain academic motivation, do peers' and faculty members' social support show compensatory interaction?*

Two structural equation modeling (SEM) path models were developed separately for the "fail" group and the "succeed" group, based on the theoretical framework of Study 3 as illustrated in Figure 8. The models aimed to investigate the interactions between peer support variables and faculty member support variables. However, both models exhibited inadequate fit indices, thereby precluding further interpretation. Specifically, the model for the "fail" group displayed the following fit indices:  $\chi^2 (15) = 47.17, p < .001$ ; CFI = .53; TLI = -.15; RMSEA = .16, 90% CI [.11, .22]. Similarly, the model for the "succeed" group showed the following fit indices:  $\chi^2 (15) = 72.46, p < .001$ ; CFI = .47; TLI = -.32; RMSEA = .19, 90% CI [.15, .23]. Hence, these models did not meet the criteria for acceptable model fit and further interpretation was deemed inappropriate.

### **Study 3: Discussion**

Study 3 aimed to investigate the interaction between home and college based social support agents in the motivational self-regulation of college students who struggle with maintaining academic motivation due to lower-than-expected performance results. Research questions were addressed primarily related to the impact of parental support on goal adjustment strategies and academic motivation and whether the lack of support within college context can be

compensated by parental support. The findings provided insights into the complex interplay between social support and motivational processes in the academic context.

Consistent with Study 2 findings, that participants who received lower than expected midterm scores exhibited significantly lower levels of academic motivation compared to those who received midterm scores that were the same as or higher than their expectations. This finding, in line with Study 2 results, suggests that lower-than-expected performance results can negatively impact students' academic motivation and engagement. In line with Study 2 as well, the regression analysis among participants who received lower than expected midterm scores showed that goal adjustment was positively associated with academic motivation after receiving the midterm exam score. This suggests that engaging in goal adjustment strategies may help students protect their academic motivations in the face of frustrating performance results. These findings provided further support for the Study 2 results pertaining to Research Question 3 and set the foundation for hypothesis testing in Study 3.

Regarding Hypothesis 5.1, which proposed that parental informational and emotional support would predict greater use of goal adjustment strategies, the findings did not support this prediction. The results indicated that neither parental informational support nor emotional support significantly predicted the level of goal adjustment. This suggests that when college students are informed to set more realistic academic goals by receiving discouraging performance feedbacks, the extent to which they employ goal adjustment strategies may not be influenced by the support received from their parents. This result complements the finding from Study 2 that has shown the importance of informational social support from peers and faculty in the college environment and how that facilitates adaptive coping strategies during academic challenges.



Hypothesis 5.2, proposing that parental emotional support would predict a higher level of academic motivation after adjusting goal, received empirical support. The results indicated a significant interaction between Parental Emotional Support and Goal Adjustment in predicting Academic Motivation (post-midterm). Further analysis revealed that the coefficient between goal adjustment and academic motivation was greater when parental emotional support was higher. In other words, participants were more likely to effectively reengage with adjusted academic goals after downward adjustment when they received greater emotional support from their parents.

To address Research Question 6, which explored the potential moderating role of parental support in the absence of social support within the college context, multiple SEM path models were utilized. Regarding Hypothesis 6.1, which proposed that parental informational support would predict a greater use of goal adjustment strategies, especially when college students lacked peers' informational support, the results did not support this hypothesis. There was a positive main effect of informational support from peers on the likelihood of employing goal adjustment strategies, but there was no significant interaction between parental informational support and peer informational support in predicting goal adjustment. These findings indicate that informational support from peers alone can be sufficient in assisting participants adjust their course grade goals. Additionally, the results suggest that when college students lack informational support from their peers, receiving higher levels of informational support from parents may not compensate for this deficiency or facilitate the use of goal adjustment strategies.

Specifically, when participants reported receiving a high level of emotional support from their peers, parental emotional support did not significantly contribute to fostering academic motivation following goal adjustment. In contrast, when college students perceived a lack of emotional support from their peers, higher levels of emotional support from parents effectively

compensated for this deficit and positively influenced their motivation towards the adjusted academic goals. These findings highlight the critical role of parental emotional support in bolstering college students' motivation in situations where peer support is lacking.

On the other hand, Hypotheses 6.4, 6.5, and 6.6, exploring the potential compensatory or additive effects of parental support and faculty member support during goal adjustment and reengaging with adjusted goals, were not supported. The results did not demonstrate any significant interactions between Parental Informational Support and Faculty Member Informational Support, between Parental Emotional Support and Faculty Member Emotional Support, or between Goal Adjustment, Parental Emotional Support, and Faculty Member Emotional Support. These findings suggest that faculty members' support may not interact with parental support to influence college students' goal adjustment processes or academic motivation.

In light of the exploratory nature of our study, we also examined whether a lack of social support from one source within the college context could be compensated by support from another source within the same context. However, the SEM path models exploring the interactions between peer support variables and faculty member support variables did not yield satisfactory fit indices. As a result, it was impossible to draw conclusions from these models, and further investigations may be required to explore this aspect in future research.

In conclusion, Study 3 reveals the pattern of interplay between social support, goal adjustment, and academic motivation in college students facing academic challenges due to discouraging performance feedback. While parental emotional support was found to be particularly influential in promoting academic motivation after goal adjustment, other sources of emotional social support, such as peer and faculty member support, did not exhibit such compensatory effects. The findings also highlight the unique roles of different sources of social

support, with parental emotional support emerging as a critical factor in facilitating academic motivation after goal adjustment, particularly in the absence of peer support. Moreover, it is imperative to recognize the consistent benefit of peers' and faculty's informational support in facilitating the use of goal adjustment strategies across all models tested. This observation aligns with the findings from Studies 1 and 2, indicating that parental informational support may hold less influence over academic motivation in college settings. Instead, the immediate sources of informational support within the newly established college context emerge as more critical determinants of academic motivation.

One crucial direction for future investigations involves adopting more nuanced analytical approaches to examine the actual transaction of support within social networks. Although self-report measures have proven useful in capturing participants' perceptions of social support, incorporating more direct observation of supportive interactions can offer a richer understanding of how social support unfolds in real-life academic settings. Additionally, exploring the temporal dynamics of social support and goal adjustment in a more fine-grained timeframe can enhance our comprehension of the underlying processes. Longitudinal studies that track changes in students' aspirations and academic goals as a response to specific social support events over time can provide valuable insights into the causal relationships between support and motivational self-regulation.

## Chapter 3: General Discussion

### Interpretation of Findings from Study 1

This dissertation project examined the role of parental, peer and faculty support in the motivational self-regulation of college students. Three separate studies were conducted to explore different aspects of this topic.

Study 1 was centered around investigating the changes in parental support that occur when high school students transition to college, along with examining the potential effects of these changes on the students' academic motivation.

Research Question 1 inquired whether leaving home to attend college would lead to changes in the level of parental support. To address this question, the study explored the trajectories of parental support as high school students made the transition to college life, focusing specifically on differentiating emotional support from informational support. The results revealed that, contrary to the expectation, informational support remained relatively stable during the transition to college, independent of the educational background of the parents. Specifically, the amount of informational support received by the students regarding their academic goals did not differ significantly based on whether their parents had firsthand knowledge of higher education institutions. On the other hand, emotional support from parents exhibited a decrease during this transitional period, which aligned with findings from prior studies that suggested a decline in parental support when students leave their families to enter college (Larose et al., 2019). Notably, this decrease in emotional support was observed only among participants whose parents had lower educational attainment. In contrast, participants with parents who had higher educational backgrounds did not experience a significant decline in emotional support from their parents. In summary, while the study's findings confirmed the

previous literature's observation that parental support might decrease during the transition to college, it was a novel finding that this decrease specifically applied to emotional support and not informational support and that it was only found for parents with lower educational attainment.

The study does not have specific information about potential reasons for the contrast between the changes in emotional and informational support. One way to interpret this can be that advancements in technology and communication platforms enable college students to maintain a satisfactory level of informational support from their parents despite the physical separation that occurs when entering college. On the other hand, emotional support may require more in-person contact to be maintained, which could explain why emotional support decreased when participants moved out from their parents' homes.

The study also considered why the different levels of parental educational attainment did not significantly affect the amount of informational support received. Technological advancements may allow parents to access information relevant to their children's academic goals, even if they themselves did not attend higher education institutions. One potential counterargument, that participants might have already been self-reliant in acquiring the informational support they needed during high school, was deemed unlikely due to the significant variance and balanced distribution of the Parental Informational Support variable at both Time 1 and Time 2.

It remains challenging to interpret why parental emotional support decreased only in the participant group whose parents had lower educational attainment. One plausible explanation is that parents with lower education levels may perceive their children's departure for college as a step toward self-reliance and separation from their family of origin, resulting in a greater reduction in emotional support. Another possibility is that the college environment is unfamiliar

to parents with lower educational attainment, leading them to perceive a growing difference between themselves and their children, resulting in increased emotional distance (Raup & Myers, 1989; Piper & Breckenridge-Jackson, 2007; Mitchell et al., 2009; Piper & Breckenridge-Jackson, 2007). Further research is needed to explore the underlying mechanisms and potential cultural or socio-economic factors contributing to this differential effect.

Research Question 2 aimed to examine whether the differences in the changes in emotional and informational parental support would affect academic motivation in college. The prediction was theoretically grounded in the notion that sudden changes in social relations and the need to adapt to new social norms during the college transition could sometimes lead to social isolation, a decline in academic motivation, and, in extreme cases, college dropout (Compas et al., 1986; Faye & Sharpe, 2008). The findings confirmed this prediction, revealing that the decrease in emotional support from parents was associated with lower levels of academic motivation in college. The study's results reinforced the robustness of the previous finding that parental support continues to be influential beyond high school education in fostering academic success (Chang et al., 2010b; Kriegbaum et al., 2016). It is possible that the emotional support provided by parents potentially served as a source of encouragement, validation, and belief in their children's abilities, thus positively influencing their motivation to succeed academically (Fulton & Turner, 2008). In contrast, the study found no significant association between informational support from parents at Time 2 and academic motivation, suggesting that not all types of parental support are equally linked to academic outcomes in college. In sum, the study expanded on previous literature by emphasizing the differential roles of emotional and informational social support in promoting academic motivation, particularly in the context of

college education (Leung et al., 2010; Malecki & Demary, 2003; Demary et al., 2005; Wentzel et al., 2010; Song et al., 2015; Tennant et al., 2015).

Nevertheless, several areas warrant further investigation. First, the study did not explore the precise mechanisms through which emotional support from parents may help college students maintain academic motivation.

Second, given the continued importance of informational social support in achieving higher academic outcomes according to previous studies, it is crucial to investigate which sources of support become more critical than parental support in terms of providing informational support (Leung et al., 2010; Malecki & Demary, 2003; Demary et al., 2005). This exploration is also relevant to understanding how critical sources of social support change throughout one's lifespan (Heinze et al., 2015).

Lastly, Study 1 did not include detailed measures for social support attained within the college context, which could serve as a new critical source of informational support to substitute for parental support, which was more influential during the college application phase (typically during junior year in high school). Therefore, investigating the extent and impact of social support received from these alternative sources, such as peers and faculty members, would provide a more comprehensive understanding of the overall support network available to college students and its influence on their academic motivation. Subsequent studies should consider incorporating measures to assess the degree of emotional and informational support from diverse sources, enabling a more nuanced examination of the differential effects of various support systems on academic motivation.

To address the remaining questions from Study 1 and explore processes involved in dealing with an academic challenge, Study 2 was designed. It aimed to investigate the process of

motivational self-regulation for challenging academic goals and examine the different roles of informational and emotional social support from peers and faculty members within the college environment. The study aimed to complement Study 1's findings by investigating how social support attained within the novel college environment can influence academic motivation.

### **Interpretation of Findings from Study 2**

Study 2 used the challenge of experiencing disappointing academic performance as a context to examine role of social support in promoting the use of the motivational self-regulation strategy of goal adjustment. Study 2 also explored the role of social support from peers and faculty members in students' motivational self-regulation.

Research Question 3 addressed the question whether college students could sustain their academic motivation when encountering discouraging feedback on their performance by utilizing goal adjustment strategies. The results revealed that participants who received midterm exam scores lower than their expectations exhibited significantly lower academic motivation compared to those who received scores that were better or at par with their expectations. In other words, when students realized they had unrealistically high expectations for their academic performance, they did not demonstrate increased engagement to compensate for the lower scores; instead, they experienced a decline in motivation. This finding is in line with prior research on the adverse impact of discouraging grade feedback on college students' academic motivation (Pulfrey et al., 2011; Chamberlin et al., 2018). The midterm feedback might have informed the participants that their original grade goals, towards which they had invested effort, were no longer attainable. Consequently, they might have felt that persisting with these futile goals did not make sense anymore. Additionally, the discouragement itself resulting from the feedback may have elicited negative emotions that subsequently diminished their motivation.



It was also found that when college students were at risk of becoming discouraged due to lower-than-expected midterm exam results, downwardly adjusting their goals helped them maintain their motivation to continue their studies. On the other hand, this benefit of goal adjustment on shielding academic motivation was not observed when the midterm exam results were higher than or same as the participants' expectation. This finding aligns with one of the main theoretical frameworks of the current dissertation, emphasizing the benefits of using goal adjustment strategies to protect motivation (Wrosch et al., 2003; Heckhausen et al., 2019). Providing evidence to the literature, Study 2 results indicated that when college students perceived their academic goals as unattainable, adjusting those goals to a more realistic level effectively maintained engagement and prevented frustration.

On the other hand, contrary to the prediction, the difference between expected and actual exam scores did not yield significant relationships with the variables of interest in the tested regression model. The study hypothesized that students that exhibited a higher degree of unrealistic optimism would experience more benefits upon goal recalibration. However, this gap between the expected and actual score did not necessarily interact with the extent of participants' benefit from employing goal adjustment strategies.

This finding can be possibly attributed to the nature of the measurement used to assess the goal adjustment variable. It appears that the obtained measurement may not directly capture the degree to which participants lowered their goals, but rather serves as a reflection of their inclination to employ such strategies. In essence, the measurement primarily reflects the strength of participants' will to implement goal adjustment, rather than the actual extent of their downward adjustments in goal setting. For instance, if one participant lowered their course grade goal from 90 to 60, it does not necessarily imply that they would report a higher goal adjustment

value compared to another participant who lowered their grade goal from 70 to 60. Instead, the measured values may signify how much participants were willing to adapt and modify their goals to align with the perceived attainability.

Nevertheless, it is essential to note that employing goal adjustment strategies showed a strong association with the level of academic motivation maintained after receiving the midterm scores. This consistent finding was supported by all relevant models examined in this dissertation and reflects the robust benefits of goal adjustment in preserving and sustaining academic motivation in the face of challenging performance outcomes.

Research Question 4 focused on investigating the potential facilitative role of social support within the college environment on participants' motivational self-regulation. The results revealed that while informational support from both peers and faculty members had a positive influence on motivational self-regulation, emotional support from these sources did not significantly contribute to the self-regulation process.

Based on prior literature (Brandstätter & Schüler, 2013; Heckhausen, et al., 2010; Heckhausen et al., 2019), it was hypothesized that the application of goal adjustment strategies could be supported by addressing the volitional bias towards overestimating goal achievability. This bias is considered a strategic means of fostering persistence in the pursuit of a goal, but often hinders goal adjustment processes (Brandstätter & Schüler, 2013). Accordingly, it was predicted that having individuals who could provide objective assessments of goal progress would help counteract this bias (Brandstätter & Schüler, 2013; Andrew & Thomson, 2009).

Consistent with this prediction, informational support from peers and faculty members were both observed to increase the use of goal adjustment strategy within the participant group that had received lower-than-expected academic performance. This result may suggest that

peers' assistance helped participants gain a more objective understanding of typical performance levels in their courses, leading to the establishment of realistic academic goals. Additionally, engaging in social comparisons with peers likely provided participants with more objective insights into typical student scores, further facilitating the use of goal adjustment strategies by advising them to lower unrealistic score expectations, thus avoiding discouragement and promoting sustained engagement with the course. Similarly, informational support from faculty members may have offered valuable insights, enabling participants to develop more realistic grade expectations and explore alternative pathways through the adoption of goal adjustment strategies.

The prediction that emotional support would foster social acceptance and reduce anxiety related to disappointing others with lower performance, ultimately leading to easier goal adjustment decisions, was not supported by the results (Carver & Scheier, 1998; Scheier & Carver, 1981; Wrosch et al., 2003). In the context of peer support, one possible interpretation is that the need for social acceptance from peers may not be contingent upon academic performance, suggesting that there was no significant social pressure from peers to achieve high academic performance in the first place, which may have hindered the adoption of goal adjustment strategies. With respect to the provision of emotional support by faculty members, it is conceivable that the degree of emotional acceptance received from a faculty member may not be considered a prioritized goal in the lives of college students, necessitating further comprehensive investigation in future research.

In Study 2, it was also hypothesized that emotional support provided within the college context would aid participants in managing negative emotions associated with disengaging from a futile goal and foster positive emotions towards newly set goals, thus enhancing motivation

with the adjusted goal (Karademas, 2006; Duke et al., 2002; Rasmussen et al., 2006). Contrary to the expectation, emotional support from peers and faculty members did not show a significant effect in facilitating the transition from adjusting previous goals to engaging with new adjusted goals.

However, it is important to acknowledge that these results do not necessarily imply that emotional support lacks utility in the process of motivational self-regulation of challenging academic goals. Notably, a positive main effect was found between faculty members' emotional support and academic motivation, irrespective of the absence of an interaction between faculty members' emotional support and the use of goal adjustment strategies. Furthermore, Study 1 revealed a significant influence of emotional support from parents on academic motivation in college. These findings suggest the need for further investigation into emotional social support to comprehensively understand its role in motivational self-regulation.

### **Interpretation of Findings from Study 3**

Study 3 aimed to explore how the interaction between family and college-based social support agents influences the motivational self-regulation of college students facing academic motivation challenges due to lower-than-expected performance results. The study was theoretically guided by the expectation that different types of social support from various sources may play distinct roles in the components of motivational self-regulation, particularly involving goal adjustment. Also, the study sought to investigate whether students can overcome the lack of social support from the college context and determine if continued support from parents can compensate for this deficiency (Larose et al., 2019).

Prior to addressing the research questions of Study 3, the study verified whether the experiences of participants in Study 3 were similar to those in Study 2, to ensure the

generalizability of the findings. Consistent with Study 2, participants who received midterm scores lower than their expectations demonstrated significantly lower levels of academic motivation compared to those who met or exceeded their expectations. This suggested that lower-than-expected performance could lead to decreased academic motivation, especially when results fall short of expectations. Among participants receiving lower-than-expected midterm scores, engaging in goal adjustment strategies was positively associated with academic motivation after receiving the exam score. This indicated that adjusting academic goals could help protect and maintain academic motivation despite disappointing performance results.

Research Question 5 of Study 3 explored the role of parental support in the motivational self-regulation of college students at risk of losing academic motivation due to discouraging performance feedback. The study did not find a significant relationship between parental informational support and the use of goal adjustment strategies. This suggested that parental informational support might have less impact on college academic motivation, as previously discussed in Study 1. Conversely, as shown in Study 2, peers and faculty members seemed to have a more significant influence on the goal adjustment process than parental informational support. Therefore, it can be concluded that the critical source of informational support may shift from parents to socialization agents within the college context as young adults transition from high school to college. Peers and faculty members may possess specific knowledge, experiences, or resources that are particularly relevant to college students facing academic challenges, providing strategic advice on goal engagement and objective perspectives on expected course performance. In contrast, parents may have less context-specific knowledge, making their informational support less effective.

Study 3 found a significant interaction between parental emotional support and goal adjustment in predicting academic motivation. Participants were more likely to effectively reengage with adjusted academic goals after downward adjustment when they received greater emotional support from their parents. This finding aligned with results from Study 1 and previous literature, showing that parental support remains essential beyond high school, particularly in terms of emotional support (Kriegbaum et al., 2016).

This finding confirmed the theoretical prediction that emotional social support may assist in emotional regulation required to overcome depressive feelings after goal adjustment and maintain motivation towards the new goals (Carver & Scheier, 1998; Scheier & Carver, 1981; Wrosch et al., 2003). Specifically, emotional support from parents may contribute to students' emotional regulation in response to negative emotions stemming from disappointing midterm scores or the process of goal disengagement. Moreover, parental emotional support may encourage students to engage with their newly adjusted goals. Lastly, the absence of a similar effect when emotional support came from peers or faculty members suggested that parents held a more influential role in providing emotional support compared to other sources.

Research Question 6 explored the potential interaction between parental support and social support within the college environment in facilitating goal adjustment and sustaining academic motivation among college students. When participants reported receiving a high level of emotional support from peers, parental emotional support did not significantly contribute to fostering academic motivation following goal adjustment.

On the other hand, in cases where college students perceived a lack of emotional support from peers, higher levels of parental emotional support effectively compensated for this deficit and positively influenced their motivation towards the adjusted academic goals. This finding

provided valuable insight into how different sources of support may compensate for the absence of each other. This substantial impact of peer emotional support implies that the absence of statistical significance observed in other hypothesis testing pertaining to peer emotional support does not definitively indicate its insignificance in relation to academic motivation. Further research should examine how peers' social support may interact with other sources or types of support to reveal the unique effect of peers' emotional support.

Faculty member support did not interact with parental support to influence college students' goal adjustment processes or academic motivation. This suggested that parental support and faculty member support operated independently in relation to academic motivation. The contrasting dynamics between these results and those related to peer social support indicated that faculty members' social support and peers' social support may follow different patterns despite both originating from the college context. Therefore, future research should focus on differentiating the roles of various social support agents within the college environment, including more diverse sources of support, such as academic counselors.

### **Limitations and Future Directions**

First and foremost, the present dissertation provides only a limited investigation into the differences between various demographic groups. In Study 1, while the results demonstrated that the observed effect was not solely attributed to the contrast between students attending 4-year and 2-year colleges, it was evident that these two groups significantly differed in terms of physically moving away from their parental household to attend college. Consequently, it remains worthwhile to investigate whether this contrast contributed to the variance in receiving parental support, a facet not yet comprehensively explored in the current research. Both Study 2 and Study 3 revealed that participants' residential situations led to substantial disparities in the

emotional support received from peers. Notably, on-campus participants consistently reported significantly higher levels of peer emotional support. Though this finding did not substantially affect the present research's outcome variable, delving into the reasons why on-campus students receive greater emotional support from friends offers valuable insights. One plausible explanation is that the exchange of information can occur without close intimacy, while emotional support necessitates face-to-face rapport, which is more readily built through frequent in-person interactions. Moreover, despite the absence of significant ethnic variations in the current research's observations, analyzing the data based on participants' cultural backgrounds remains a worthwhile pursuit. For instance, cultural minorities might face challenges in establishing in-person social support within the college context. Conversely, maintaining social support from parents could be particularly elusive for international students whose parents reside overseas. Additionally, advancements in communication technology might mitigate the limiting impact of physical distance on accessing social support.

The second limitation of this research primarily concerns the measurement approach employed. The self-report questionnaire used to approximate the extent of social support provided oversimplifies the complex dynamics of real-life support, leaving crucial nuances unaccounted for. To facilitate more comprehensive observations, future studies should include measures such as the frequency of social contact and specific records detailing the types of support offered. Furthermore, given that social support is a dynamic concept influenced by individual personalities and historical factors, future research would be more insightful if it incorporates measurements of these variables as well. Additionally, the current dataset does not distinguish whether the support received from peers and faculty members was contingent on whether they shared the same course as the participants. Controlling for this factor in future



studies is imperative. In terms of improving the measurement in the future studies, a more nuanced approach to tracking participants' goal adjustment should also be pursued. Relying solely on subjective surveys regarding their intention to modify their goals may not sufficiently capture the full extent and timing of such adjustments. Employing objective and longitudinal tracking of participants' actual aspiration levels at multiple time points would yield clearer insights. Also, the absence of specific behavioral outcomes, such as study hours invested or grade outcomes for the relevant course, hinders a comprehensive understanding of whether sustained academic motivation translates into improved educational achievements. Including these measures in future studies can provide valuable insights in this regard.

The third limitation pertains to inconsistencies in the samples across the studies. Differences in data collection periods between Study 1 and Study 2 might have resulted in cohort effects, particularly concerning cultural variations in parent-child interactions. Additionally, the transition from online to in-person university courses during Study 3, influenced by the COVID-19 pandemic, introduced disparities in participant demographics that require attention in future investigations.

Lastly, future research should encompass a broader array of support sources beyond the three most representative ones examined in the current study (i.e., parents, peers, and faculty members). For instance, academic counselors and non-family informal mentors could play crucial roles in influencing academic motivation as suggested by previous literature (Chang et al., 2010a). Moreover, considering support derived from non-interactive sources, such as course websites or materials, can enrich our understanding of the overall support landscape in academic settings.

## **Contribution to Existing Literature**

This dissertation project makes contributions to the understanding of the interface of motivation and social support, revealing the intricate dynamics of different types of support and their sources in influencing college students' motivational self-regulation. The findings of this research provide valuable insights into the role of emotional and informational support in distinct aspects of the self-regulation process, expanding the understanding of how social support influences academic motivation during the critical college transition period. Furthermore, it validates the efficacy of employing compensatory secondary strategies following failure, with informational support promoting goal adjustment and emotional support fostering engagement with adapted goals.

Previous research has evidenced that age-normative patterns exert a substantial impact on the determination of the most pivotal source of social support throughout an individual's lifespan. (Heinze et al., 2015). Transitioning from high school to college presents challenges in maintaining a support network due to increased independence (Zarret & Eccles, 2006), leading to potential social isolation, reduced academic motivation, and college dropout in extreme cases (Compas et al., 1986; Faye & Sharpe, 2008). The current research contributed to our understanding of this critical social and institutional transition by emphasizing that social support sources within the college context can compensate for the declining influence of parental support in the college years. The results indicate a developmental transition in the ecology of social support, where parental informational support, which was essential during high school, becomes less impactful in college. Instead, support provided by peers and faculty members within the college environment becomes more relevant and effective in guiding students towards academic success. However, when not readily available in the college context, emotional support from

parents can still play a critical role for these young adults. Additionally, this research also reaffirms previous findings indicating the continued significance of parental support during the college years through revealing the role of parents' emotional support in academic motivation (Chang et al., 2010b; Kriegbaum et al., 2016). Furthermore, the study highlights the possibility of interaction between social support agents. Emotional support from parents was found to be particularly potent in compensating for the lack of emotional support from peers. This suggests that the absence of support from one source may be mitigated by the presence of support from another, emphasizing the dynamic interplay of various social support systems in influencing students' motivational self-regulation.

Secondly, the present research provides empirical validation for the utility of employing a compensatory secondary strategy following failure, as posited by the Motivational Theory of Lifespan Development (MTD) (Heckhausen et al., 2019). In addition to demonstrating the efficacy of goal adjustment strategies in safeguarding motivation, the study also examines how various forms of social support can assist individuals in surmounting specific obstacles that hinder the adoption of such strategies (Wrosch & Schulz, 2019; Brandstätter & Schüler, 2013). Notably, the findings highlight that informational social support facilitates goal adjustment, whereas emotional social support fosters engagement with newly adapted goals.

Thirdly, empirical studies have explored the impact of various sources and types of social support on academic motivation, but a comprehensive model is yet to be developed (Malecki & Demary, 2003; Demary et al., 2005; Wentzel et al., 2010; Song et al., 2015; Tennant et al., 2015). According to the findings from the current research, emotional support from parents is more influential in facilitating students' reengagement with adjusted academic goals after facing discouraging performance results. On the other hand, informational support from peers and

faculty members is more effective in promoting the use of goal adjustment strategies, assisting students in lowering their goals when necessary to protect and sustain academic motivation.

Last but not least, this dissertation uniquely establishes the profound implications it holds for educational interventions and support programs geared towards nurturing academic triumph among college students. By comprehending the distinct roles played by various types of support from diverse sources, crucial insights are gained to develop precision-targeted interventions that will bolster students' motivational resilience and persistent engagement. Moreover, this dissertation highlights the pivotal transformation in the significance of social support sources during early adulthood, grant educators and counselors' valuable guidance in steering students towards the most fitting support networks, and ultimately propel their seamless adaptation to academic hurdles.

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## Appendix A

## 1. Study 1 Measurement Items

*Parental support*


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How many times during the past 6 months have each of the following persons done the following things? (Circle your answers below)

		<u>Your Parents</u>			
		Never	Once or twice	3 to 4 times	More often
1.	Gave or loaned you money for something you needed	1	2	3	4
2.	Gave you advice or support for your future career plans	1	2	3	4
3.	Let you know that you did something well	1	2	4	5
4.	Gave you financial advice	1	2	3	4
5.	Provide you with transportation	1	2	3	4
6.	Gave you advice about problems in your job	1	2	3	4
7.	Gave you advice about your schoolwork	1	2	3	4
8.	Let you know that he/she will always be around for you	1	2	3	4
9.	Expressed respect for a certain skill of yours	1	2	3	4
10.	Gave you advice and support in dealing with relationships with friends	1	2	3	4
11.	Told you that you are OK just the way you are	1	2	3	4
12.	Showed interest in your future educational plans	1	2	3	4

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\* Items 2 and 7 were used to measure informational support from parents, and items 3, 8, 9, 11, 12 were used to measure emotional support from parents.

*Optimization in Primary and Secondary Control scale*

The following statements are about what is important to you. There are no right or wrong answers. Please circle a number to indicate your agreement or disagreement with each statement.

	Strongly disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Strongly agree
1. The education that I get in the next few years will have a lot on influence on the rest of my life.	1	2	3	4	5
2. If I run in to obstacles with my education plans, I will ask others for advice.	1	2	3	4	5
3. I often tell myself that I will be successful in reaching my educational goals.	1	2	3	4	5
4. I will put time and effort into my education whenever I can.	1	2	3	4	5
5. When making my education plans, I think about the long-term consequences for my career.	1	2	3	4	5
6. If I cannot attain my educational goals, I will let go of them.	1	2	3	4	5
7. Even if it uses up my spare time, I will invest all my energy in getting a good education.	1	2	3	4	5
8. I will work hard to get a good education.	1	2	3	4	5
9. If I have trouble with my schoolwork, I will adjust my aspirations so they are more realistic.	1	2	3	4	5
10. Even if it takes a long time, I will not give up my educational goals.	1	2	3	4	5
11. When choosing between a broad or a specialized education, I consider my long-term career goals.	1	2	3	4	5
12. If I can't get my educational degree (major or certificate) directly, I will find an alternative path to get to it eventually.	1	2	3	4	5
13. I often remind myself how important it is for my future to have a good education.	1	2	3	4	5
14. If I don't reach my educational goals, I will say to myself that many others are in the same situation.	1	2	3	4	5
15. I often imagine that I will be happy if I earn good grades in school.	1	2	3	4	5
16. If my education plans do not work out, I will remind myself that others would be partly to blame.	1	2	3	4	5
17. If it gets more difficult to get the education that I want, I will try harder.	1	2	3	4	5
18. If I run into problems with my schoolwork, I keep in mind that it is not all my fault.	1	2	3	4	5

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19.	If I cannot attain my desired educational goals, I will settle for the next best option.	1	2	3	4	5
20.	If there are problems with my education, I will remind myself that education is not everything in life.	1	2	3	4	5
21.	If I have difficulties with my schoolwork I will get help from others (for example, friends, a tutor)	1	2	3	4	5
22.	When making my educational plans, I base my decisions on my current interest rather than my long-term goals.	1	2	3	4	5
23.	I try hard to keep away from activities that could distract me from my schoolwork.	1	2	3	4	5
24.	I would go to a lower prestige school, if it meant I could get the kind of education that I wanted in the long run.	1	2	3	4	5
25.	When I have difficulties with my schoolwork, I keep in mind that others are struggling too.	1	2	3	4	5

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\* Items 4, 7, 8 and 17 (selective primary control subscale) and items 3, 13, 15, 23 (selective secondary control subscale) were combined to measure academic motivation.

## 2. Study 2 Measurement Items

### *Midterm examination result*

What score do you expect to get in the midterm exam in your most difficult course?  
Please enter a whole number from 0 to 100.

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Did you already receive the score for your midterm exam in your **most difficult** course?

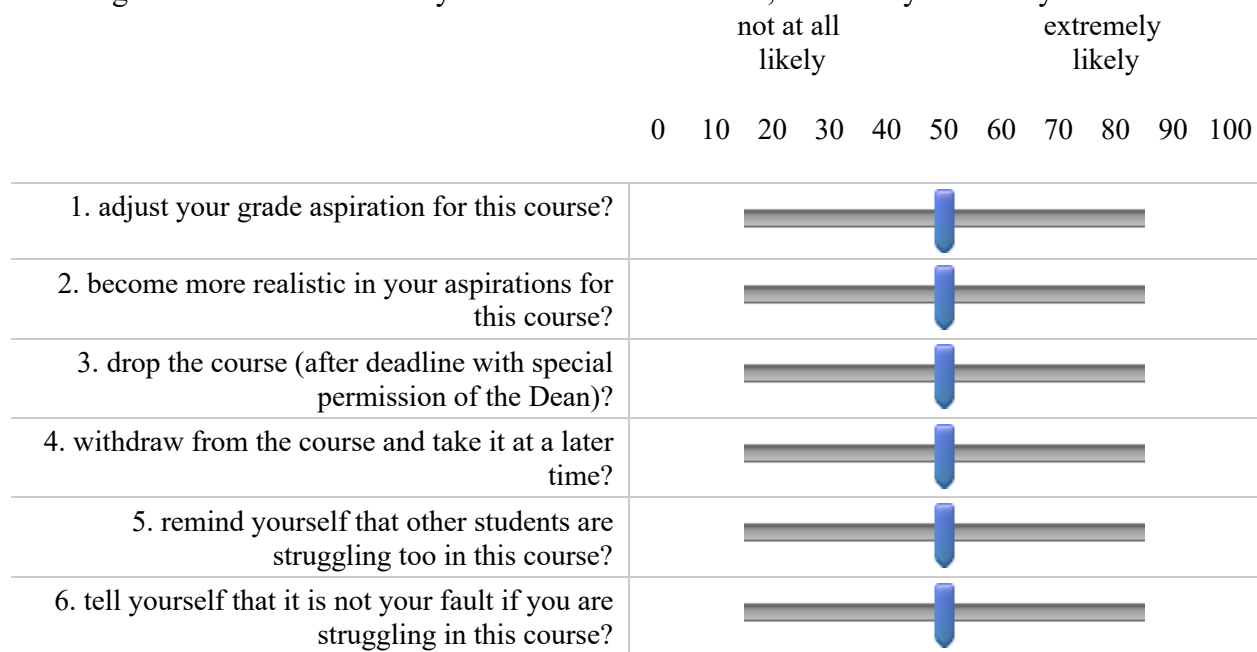
- Yes (1)
- No (2)

What score did you receive in your midterm exam in your most difficult course?  
Please enter a whole number from 0 to 100.

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*Goal adjustment strategies use*

Thinking about the next exam in your most difficult course, how likely is it that you will:

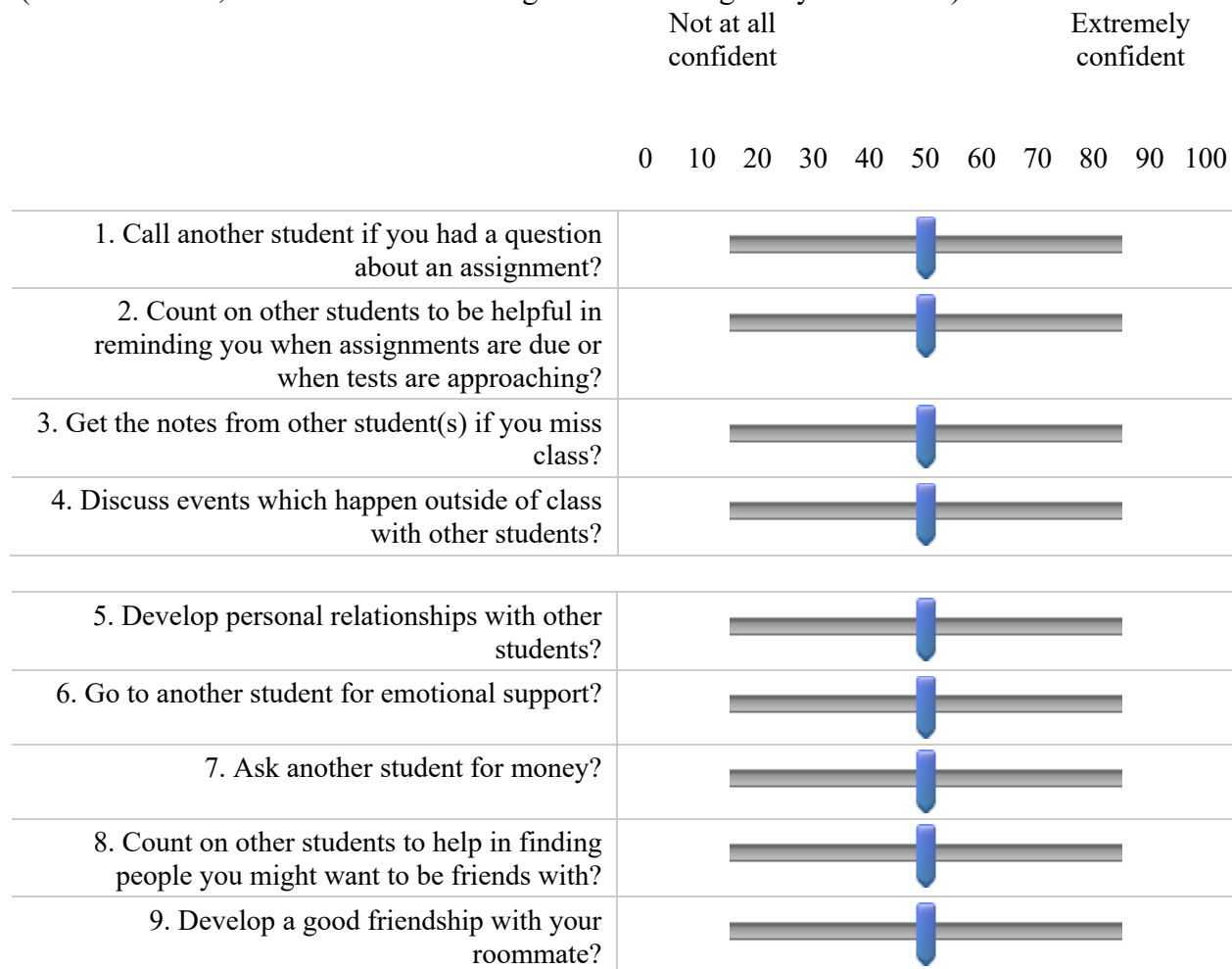


\* Item 1 and 2 were used to measure the use of goal adjustment strategies.

### *Support from peers*

How confident are you that you could:

(Please click on, or move the slider along the scale to register your answer)



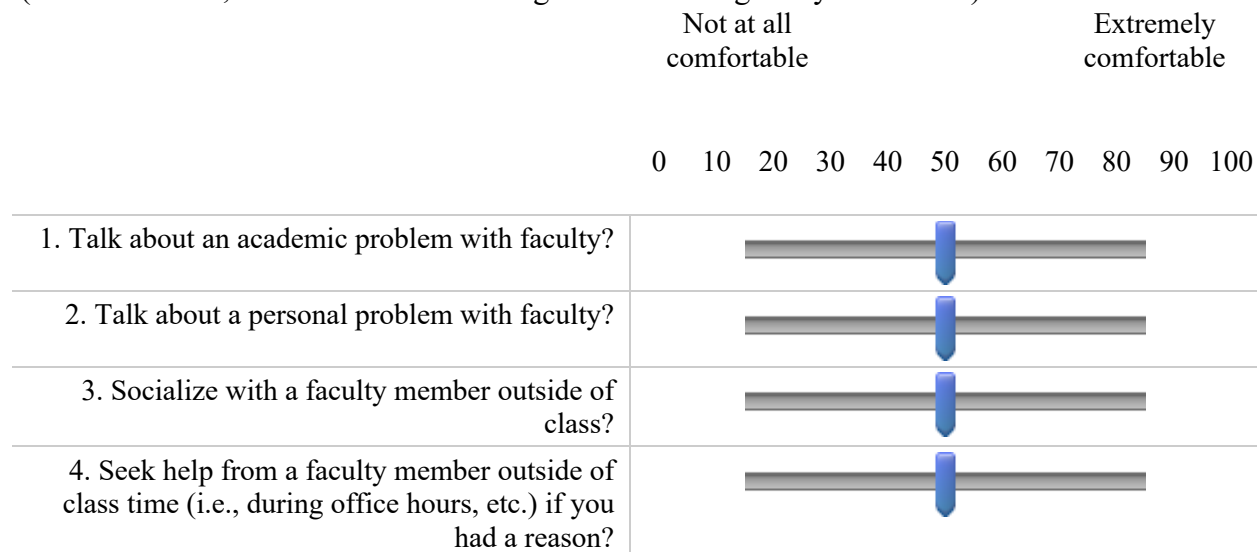
\* Items 1, 2 and 3 were used to measure informational support from peers, and items 5 and 6 were used to measure emotional support from peers.



*Support from faculty members*

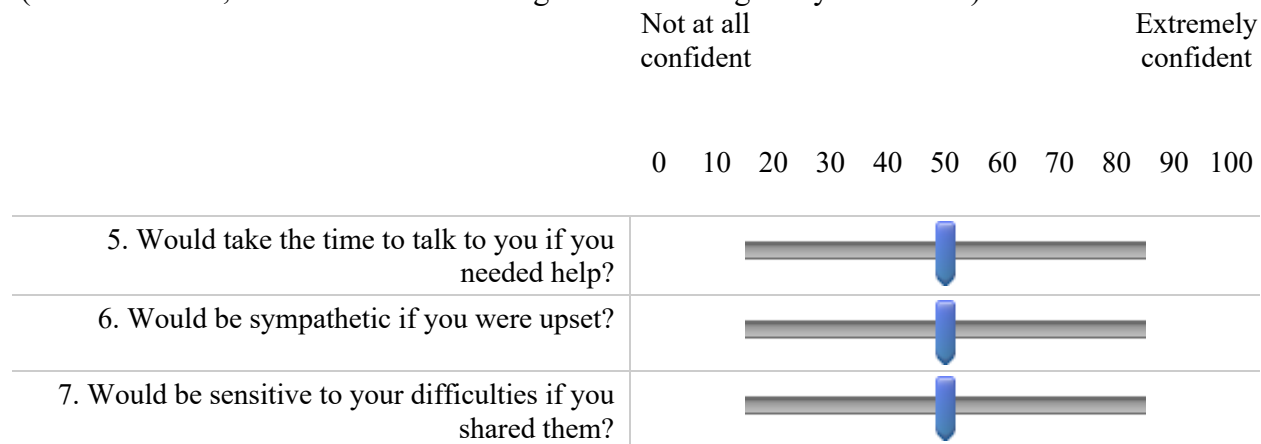
How comfortable would you feel if you had to:

(Please click on, or move the slider along the scale to register your answer)



How confident are you that a faculty member:

(Please click on, or move the slider along the scale to register your answer)

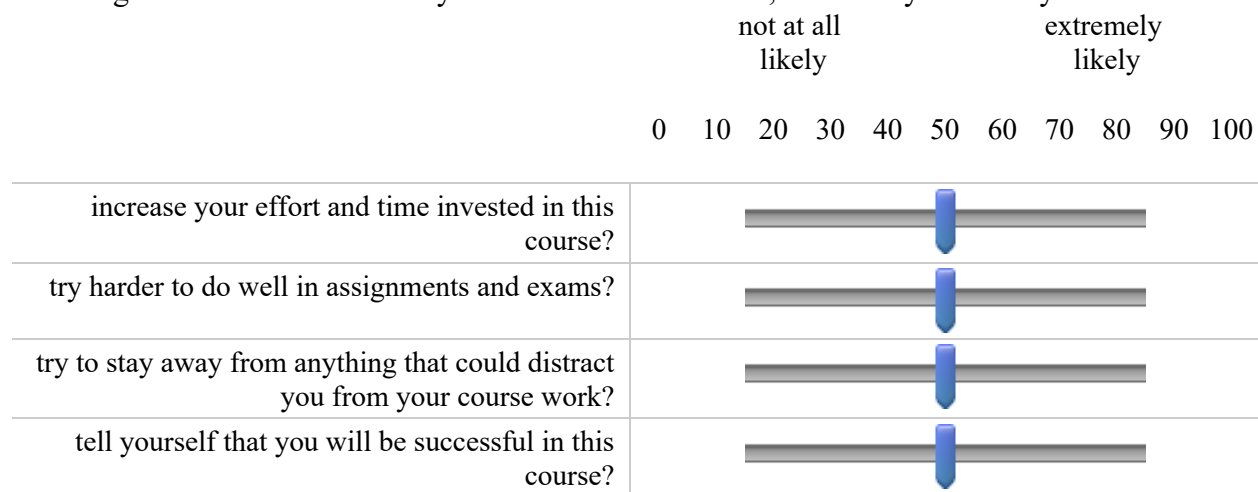


\* Items 1 and 4 were used to measure informational support from faculty members, and items 2,

6, 7 were used to measure emotional support from faculty members.

*Academic motivation*

Thinking about the next exam in your most difficult course, how likely is it that you will:



\* All items were used to measure academic motivation.

### 3. Study 3 Measurement Items

#### *Midterm examination result*

What grade do you expect to get on the midterm exam in your difficult course?

- F (1)
- D- (2)
- D (3)
- D+(4)
- C- (5)
- C (6)
- C+(7)
- B- (8)
- B (9)
- B+(10)
- A-(11)
- A (12)
- A+(13)

Did you already receive the score for your midterm exam in your **most difficult** course?

- Yes (1)
- No (2)

What grade did you receive in your midterm exam in your most difficult course?

- F (1)
- D- (2)
- D (3)
- D+(4)
- C- (5)
- C (6)
- C+(7)
- B- (8)
- B (9)
- B+(10)
- A-(11)
- A (12)
- A+(13)







*Goal adjustment strategies use*

Thinking about the next exam in your most difficult course, how likely is it that you will:

not at all likely                      extremely likely

1

7

1. adjust your grade aspiration for this course?	
2. become more realistic in your aspirations for this course?	
3. drop the course (after deadline with special permission of the Dean)?	
4. withdraw from the course and take it at a later time?	
5. remind yourself that other students are struggling too in this course?	
6. tell yourself that it is not your fault if you are struggling in this course?	

\* Item 1 and 2 were used to measure the use of goal adjustment strategies.

*Informational support from parents*

msf21: family support: How many times during the past 6 months have your parent(s)/ guardian(s): Given you advice or support for your future career plans

- Never (0)
- Once or twice (1)
- About once a month (2)
- Twice a month (3)
- Almost every week (4)
- More than once a week (5)

msf21: family support: How many times during the past 6 months have your parent(s)/ guardian(s): Given you advice about your schoolwork)

- Never (0)
- Once or twice (1)
- About once a month (2)
- Twice a month (3)
- Almost every week (4)
- More than once a week (5)

*Emotional support from parents*

msf21: family support: How many times during the past 6 months have your parent(s)/ guardian(s): Let you know that he/she will always be around for you

- Never (0)
- Once or twice (1)
- About once a month (2)
- Twice a month (3)
- Almost every week (4)
- More than once a week (5)

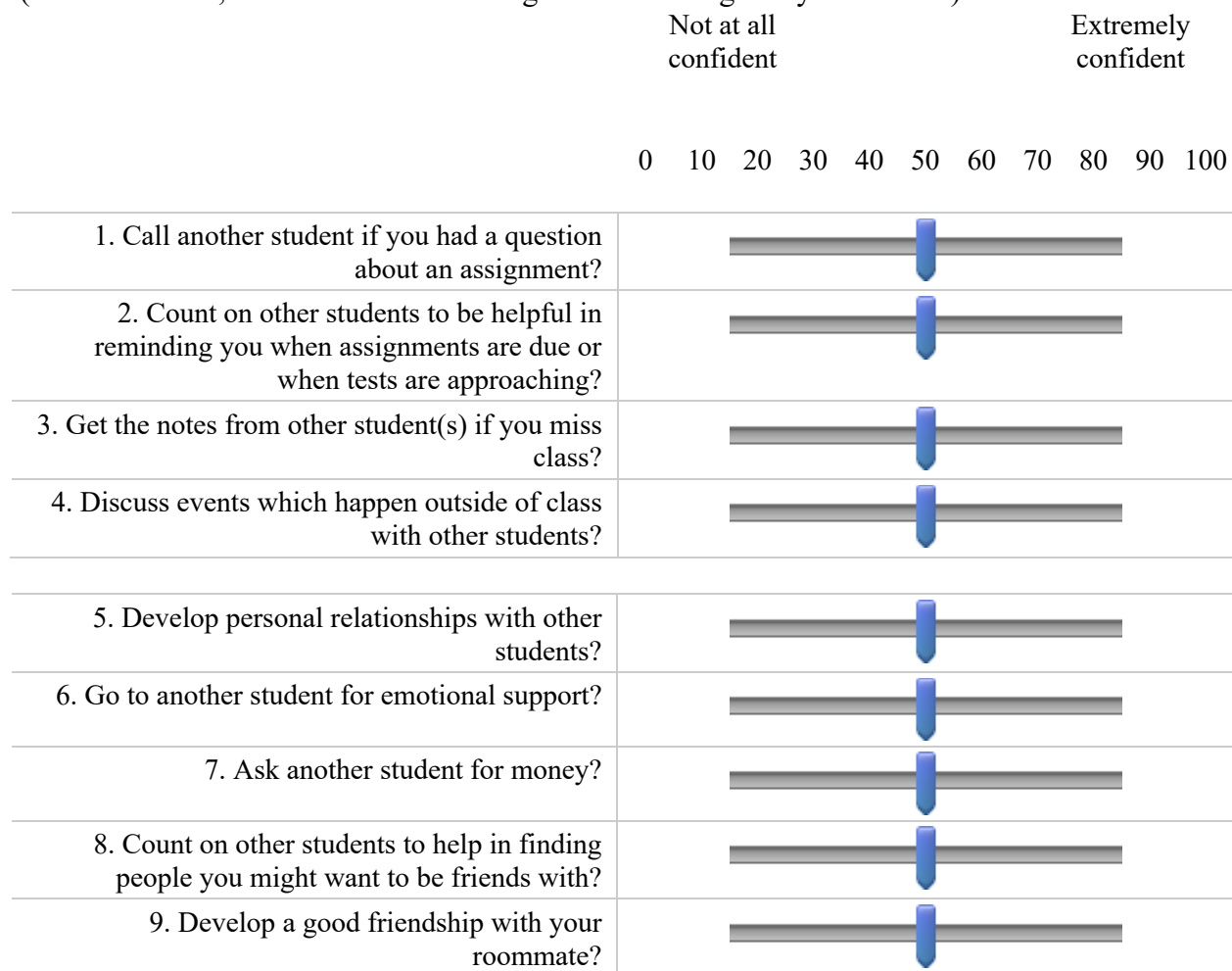
msf21: family support: How many times during the past 6 months have your parent(s)/ guardian(s): Told you that you are OK just the way you are

- Never (0)
- Once or twice (1)
- About once a month (2)
- Twice a month (3)
- Almost every week (4)
- More than once a week (5)

### *Support from peers*

How confident are you that you could:

(Please click on, or move the slider along the scale to register your answer)

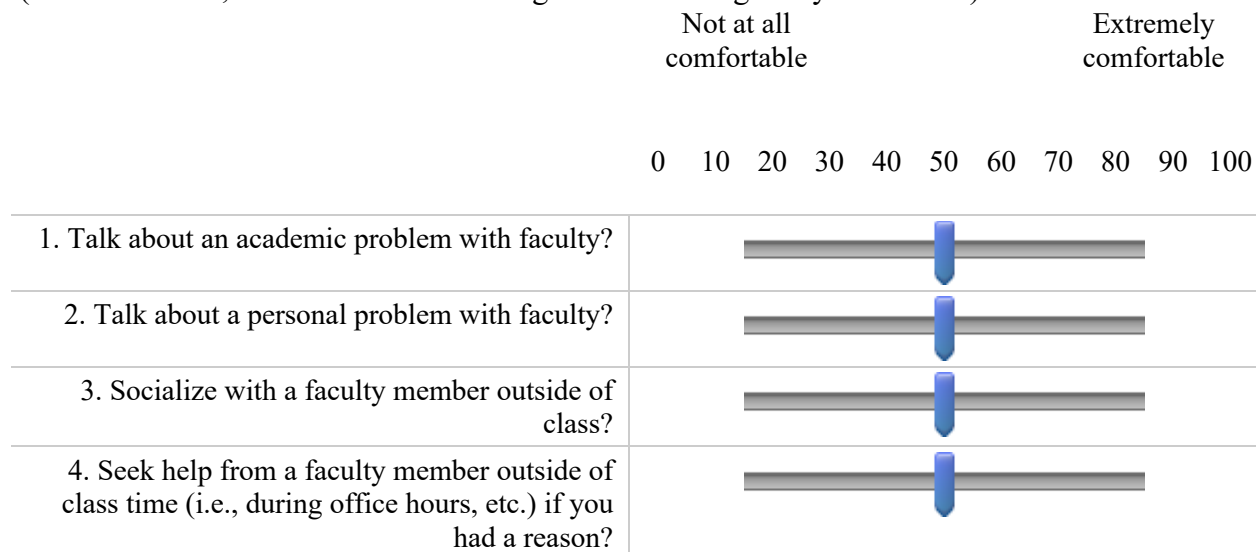


\* Items 1, 2 and 3 were used to measure informational support from peers, and items 5 and 6 were used to measure emotional support from peers.

*Support from faculty members*

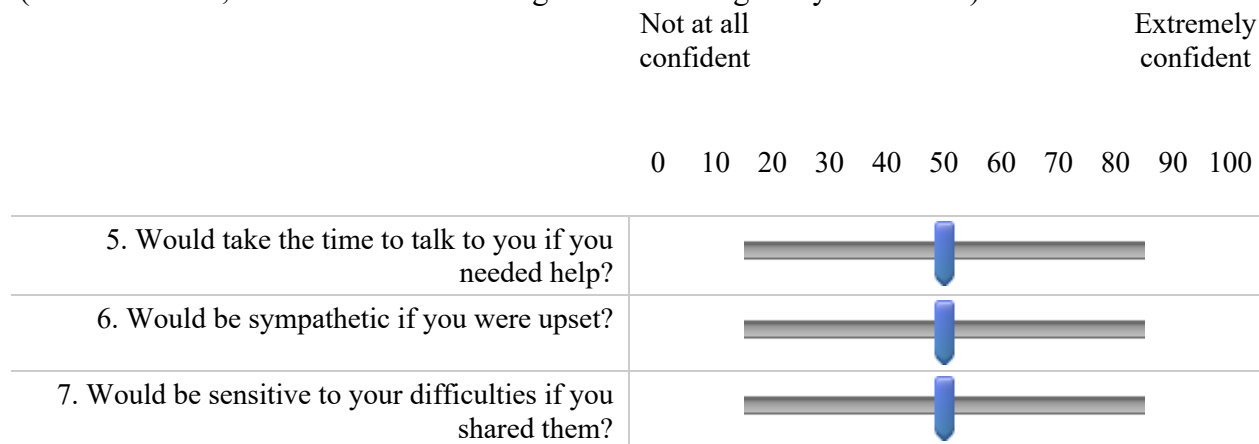
How comfortable would you feel if you had to:

(Please click on, or move the slider along the scale to register your answer)



How confident are you that a faculty member:

(Please click on, or move the slider along the scale to register your answer)



\* Items 1 and 4 were used to measure informational support from faculty members, and items 2,

6, 7 were used to measure emotional support from faculty members.



*Academic motivation*





Thinking about the next exam in your most difficult course, how likely is it that you will:

not at all  
likely

extremely  
likely

1

7

increase your effort and time invested in this course?	
try harder to do well in assignments and exams?	
try to stay away from anything that could distract you from your course work?	
tell yourself that you will be successful in this course?	

\* All items were used to measure academic motivation.

## Appendix B

## 1. Regression Model Pertaining to Study 1, with “4-year” group only:

	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI
Outcome:					
Parental Emotional Support (Time 2)					
(constant)	2.59	1.92	.180	-1.21	6.40
Living Condition	-.61	.31	.043	-1.20	-.02
Parental Education Level	.08	.17	.634	-.25	.41
Living Condition * Parental Education Level	.21	.12	.048	.00	.42
Parental Emotional Support (Time 1)	.77	.10	< .001	.56	.98
Male	-.03	0.12	.823	-.25	.20
Age	-.08	.10	.433	-.28	.12
Ethnicity					
Black	-.17	.22	.447	-.62	.27
Asian	-.03	.16	.833	-.36	.29
Hispanic	-.03	.22	.874	-.46	.39
Others	-.16	.17	.340	-.49	.17
Outcome:					
Parental Informational Support (Time 2)					
(constant)	-.45	1.97	.821	-4.34	3.45
Living Condition	-.16	.42	.711	-1.00	.68
Parental Education Level	-.08	.17	.650	-.42	.26
Living Condition * Parental Education Level	.14	.20	.476	-.25	.53
Parental Informational Support (Time 1)	.22	.12	.077	-.02	.47
Male	-.01	.12	.939	-.24	.23
Age	.11	.10	.288	-.10	.32
Ethnicity					
Black	-.31	.23	.175	-.77	.14
Asian	-.13	.17	.447	-.46	.20
Hispanic	-.19	.22	.396	-.63	.25
Others	-.24	.17	.168	-.57	.10
Outcome:					
Academic Motivation					
(constant)	2.74	1.23	.028	.30	5.18
Living Condition	-.04	.08	.585	-.20	.11
Parental Emotional Support (Time 2)	.16	.08	.042	.01	.31
Parental Informational Support (Time 2)	-.07	.07	.381	-.21	.08
Parental Emotional Support (Time 1)	.09	.08	.296	-.08	.25
Parental Informational Support (Time 1)	.02	.08	.852	-.14	.17
Male	.06	.07	.426	-.09	.20
Age	.05	.07	.459	-.08	.18

Ethnicity						
Black						
Asian						
Hispanic						
Others						

*Note.* LLCI and ULCI represent the lower-limit and upper-limit of the confidence interval (95%).  
Sample size = 118.

Study 1 results are replicated when “two-year” group and “others” group were excluded in the analysis, indicating that the findings from Study 1 are not solely due to the contrast between “four-year” and “two-year” group.