Implicit sense of gratification: a new lens on academic intrinsic motivation

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IMPLICIT SENSE OF GRATIFICATION: A NEW LENS ON ACADEMIC INTRINSIC MOTIVATION

By

Haiyang Su

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Abstract

The main purpose of this study was to explore the relationship among key concepts from three motivation theories—mastery and performance goal orientation from Achievement Goal Theory (AGT; Elliot & McGregor, 2001), proximal and distal goal setting from Goal Setting Theory (GST; Locke & Latham, 1990), and academic intrinsic motivation based on the Self-Determination Theory (SDT; Deci & Ryan, 1985). The study also examined moderating effects by gender and grade level difference on the relationship between proximal goal setting and academic intrinsic motivation. Implicit sense of gratification, a new concept proposed in this study, was used to test the mediation effect from general goal setting preference to academic intrinsic motivation. Structural equation modeling was run to investigate concepts integration and the moderation and mediation effects.

The study finally secured 384 total participants composed of undergraduate (285, 74%) and graduate students (99, 26%). Participants' goal orientation types have been found no significant difference on their level of academic intrinsic motivation and general goal setting preferences. Gender difference has been found to moderate the relationship between proximal goal setting and academic intrinsic motivation, but grade level difference failed to do such moderation. Implicit sense of gratification has been found a significant mediation effect from general goal setting to academic intrinsic motivation. The whole structural equation modeling analysis also returned a viable interpretation for the conceptual model that integrated several concepts from three motivation theories.

This study contributed not only to a theoretical integration of concepts from different motivation theories, but also to the educational implications for both undergraduate and graduate students that goal orientation types should better not be used alone to predict study outcome and
graduate students also need proper guidance in general goal setting for their academic study.

Most importantly, the study provided a new lens to look at academic intrinsic motivation.

Despite the implications and several significant findings from this study, cautions need to be taken when making generalizations from this study due to its own limitations.
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Implicit Sense of Gratification: A New Lens on Academic Intrinsic Motivation

Chapter 1: Introduction

Statement of the Problem

Students usually adopt a different mindset or attitude while learning different courses. For some courses, students' inner interest can be provoked due to various reasons such as excellent teaching styles from professors (Reeve & Tseng, 2011; Sariah, Hassan, & Rajab, 2014), intriguing learning topics (O’Keefe & Linnenbrink-Garcia, 2014), harmonious student-professor rapport (Lammers, Gillaspy, & Hancock, 2017) and so on. Students, therefore, would be inclined to devote much more time and efforts to learn them well. According to self-determination theory (SDT; Deci & Ryan, 1985), such students are assumed to having high level in academic intrinsic motivation (AIM) because their study is out of their own great interest and enjoyment. Other courses, to the contrary, may not invoke a great deal of interest for students because of obscure content that are hard to digest or dull teaching approaches that render students absent-minded in the classroom or other reasons. Students would then be prone to just graduate those courses with acceptable final grades. The achievement goal theorists (AGT; Ames, 1992; Dweck & Leggett, 1988) categorize the former attitude as mastery-oriented goals and the latter as performance-oriented goals. Such theory, however, does not imply that a student who is mastery-oriented would always implement the same attitude towards all courses. The same student could adopt different goal orientations towards different subject matters at their own discretion. A safe corollary is that the different learning attitudes determine different behaviors. Therefore, this study is interested in finding out how different goal orientations can influence the level of students' academic intrinsic motivation.
The goal setting theory (GST; Locke & Latham, 1990), which has been applied mostly in work settings but few in academic settings, points out an important pair of goal setting behaviors—the proximal goals versus distal goals. According to this theory, people do differ in their behaviors for accomplishing tasks in terms of goal setting preferences. Some people prefer to break down a task into several pieces and tackle them one by one, therefore they have multiple proximal goals to accomplish. Others, on the other hand, just have an overall distal goal to achieve the assigned objective with no intermediate goals involved. Still others would love to combine the proximal goals with distal goals to make their progress more purposeful (Latham & Seijts, 1999). It is unknown, however, to what extent can students' different goal orientations in academic study impact their goal setting behaviors accordingly. This study will attempt to investigate this question in detail.

People would normally assume that when students make every solid step towards their final goal, which means as soon as they successfully finish their proximal goals one after another consecutively, this would automatically lead to an increase of their academic intrinsic motivation, or at least give a big boost to it. However, during this process, little is known about what factors that can facilitate students setting up multiple proximal goals and what factors that will inhibit such behavior. In addition, this study is interested to find out on what situations can setting up multiple proximal goals jeopardize students' academic intrinsic motivation instead. One more aspect rarely being researched in goal setting theory is the optimal time intervals for making proximal goals, i.e., the time distance from one proximal goal to the next (Locke & Latham, 2013). Thus this study designed a couple of closed-ended questions with an attempt to know more about students' proximal goal setting behaviors. As investigated by Hegarty (2010), gender can play an important moderator role in most motivation studies. Therefore, this study
will investigate if gender explain the variability in the relationship between students' proximal goal setting and their subsequent academic intrinsic motivation. In addition, this study also attempts to explore if students' grade levels (graduate vs. undergraduate) moderate this relationship.

Making and implementing each proximal goal has been widely accepted in both work and academic settings as a valid strategy to attain desired outcome. However, the path to academic success may not always go off as smoothly as expected. For example, students may not necessarily benefit their intrinsic motivation from multiple proximal goals if the goals are made with improper difficulty levels. Both too hard and too easy goals could probably undermine students' original intention and thus derail their steady progress. In other situations, students could fail to follow their proximal goals stringently because of exterior disruptions such as the pressure to juggle many courses simultaneously or any incidents from the family. Therefore, this study will investigate a mediator to account for the relationship between proximal goal settings and students' academic intrinsic motivation, which is being named as the implicit sense of gratification (ISG) in this study. This mediator is intended to measure the extent of genuine satisfaction when students make and finish their proximal goals. In this study, it is assumed that this genuine satisfaction leads to the boost of students' academic intrinsic motivation.

Therefore, this study integrates several core constructs from three major theories with regard to motivation—achievement goal theory, goal setting theory, and self-determination theory. All the generated research questions will revolve around the relationship between these core constructs. A visual display (see Figure 1 below) presents the overall conceptual framework for this study. As the figure indicates, students' goal orientation will be used to investigate the relationship with academic intrinsic motivation and their goal setting behaviors. For the
relationship between proximal goal settings and students academic intrinsic motivation, this study is interested in finding the mediating effect of implicit sense of gratification and the moderating effect from gender and grade level factors.

Figure 1. Conceptual framework of the integrated constructs from three motivation theories. MGO and PGO represent mastery- and performance-oriented goals based on the Achievement Goal Theory. Proximal and distal goal setting are from Goal Setting Theory. ISG represents implicit sense of gratification and is the mediator in this study. AIM stands for academic intrinsic motivation. Gender and grade level will be used to explore the moderation effect for proximal goal setting and academic intrinsic motivation.

Theoretical Framework

The theoretical framework of this study is built on the integration of three mainstream theories revolving around the core concept motivation and a proposed concept the implicit sense of gratification supported by various sources from the literature.
The goal orientation from the achievement goal theory (AGT) puts students' different oriented goals into consideration when examining the relationship with their academic performance. Despite its origin in work settings to improve people's working performance, the goal setting theory (GST) also sheds light on students' academic achievement when students employ different goal setting strategies. Sansone and Harackiewicz (2000, p. 98) made a distinction that goals in goal setting are task goals but goals in goal orientation are purpose goals which mirror the underlying reasons for doing a task and provide motivational context. The intrinsic motivation—as an essential construct from self-determination theory (SDT)—is dedicated to attribute students' performance to their inner drive. The implicit sense of gratification (ISG), which is a mediator newly introduced in this study, has also received multiple theoretical support from the extant literature. The following sections will give a general introduction to each above-mentioned core concept.

**Goal orientation in achievement goal theory.** Achievement goal theory, since its inception in the 1980s, has become a leading perspective to look at students' performance in academics. According to Pekrun, Elliot, and Maier (2009), achievement goals are the goals that students are eager to pursue so as to embody their competence in academics. In its early stage, researchers have noticed two major categories of students' goal orientation, which is mastery-oriented goals and performance-oriented goals (Ames, 1992; Dweck & Leggett, 1988). For mastery-oriented goals, some researchers would prefer to call them as learning goals instead to differentiate the ones with the purpose of demonstrating one's competence (e.g., Bandalos, Finney, & Geske, 2003; Robins & Pals, 2002). Later, this dichotomous framework has been expanded to trichotomous framework by dividing the performance-oriented goals into performance-approach goal orientation and performance-avoidance goal orientation (Elliot &
With more and more studies working on this trichotomous framework, researchers have realized the necessity for further distinction of mastery-oriented goals into mastery-approach and mastery-avoidance oriented goals as well, which has now become as a $2 \times 2$ goal orientation framework (Elliot & McGregor, 2001).

With the establishment of the $2 \times 2$ goal orientation framework, researchers have shown a great deal of enthusiasm for testing the framework into academic settings. Many of the researchers have acknowledged the positive benefits of mastery-oriented goals. For example, upon investigating 77 studies about the relationship between achievement goals and achievement emotions in a meta-analysis, Huang (2011) found that mastery-oriented goals were related to more positive emotions while performance avoidance goals were associated with negative emotions. After examining over 500 junior high school students' academic motivation, Wolters (2004) emphasized the importance of having mastery-oriented goals to adapt to nearly all courses. Researchers also unveiled the positive correlation for mastery-oriented goals with stronger self-efficacy and less test anxiety (e.g., Bandalos et al., 2003). When looking at the bigger context, mastery-oriented goals can also benefit the whole school if the school emphasizes this as their overarching teaching philosophy (Meece, Anderman, & Anderman, 2006).

Other researchers, however, have gradually dawned upon the positive side for performance-oriented goals which have been often negated in the past (Elliot & Moller, 2003). Elliot and Harackiewicz (1996) claimed that it was only under certain conditions that performance-oriented goals could hurt students' intrinsic motivation. If students can receive positive feedback about their task behavior, performance-approach goal oriented students can harvest great success on their exams as well (Senko & Harackiewicz, 2005). A meta-analysis done by Linnenbrink-Garcia, Tyson, and Patall (2008) revealed a clear picture to address the
debate. In their examination of over 90 peer-reviewed articles, the benefits of mastery-oriented goals to students' academic achievement were not as dominant as was assumed. The performance-approach goals turned out to be yielding a similar amount of positive correlations as mastery-oriented goals did to the improvement of students' academic success. Such mixed results have made achievement goal researchers gradually switch their attention to a multiple goal perspective, which suggested that both mastery and performance goals can lead to academic success (Barron & Harackiewicz, 2001, 2003).

Building on the current 2 × 2 goal orientation framework and extant research findings, this study will first validate the correlation of mastery- and performance-oriented goals with college students' intrinsic motivation, then explore if these different goal orientations also impact students’ goal setting behaviors.

**Academic intrinsic motivation in self-determination theory.** Deci and Ryan's (1985) seminal work on self-determination theory (SDT) has brought people a new perspective to look at motivation. This theory divides people's motivation into two broad categories. One is from the person himself, which is called intrinsic motivation. People with intrinsic motivation have strong desire to do things out of their own will or interest. The enjoyment of doing the task dominates people's actions. On the contrary, when the desire to do things is driven by outside sources such as tangible incentives or other rewards, people are being categorized as working under the extrinsic motivation. Since the outside sources can take many forms, extrinsic motivation thus has several types (Ryan & Deci, 2000a). For example, some students work hard in an attempt to obtaining outstanding grades, while others in the hope of getting praise from peers, parents, teachers, etc. Another important construct related to motivation is the three psychological needs from self-determination theory: Need for competence, need for autonomy, and need for
relatedness. When these three basic psychological needs are met, people can have increased intrinsic motivation and improved mental health (Ryan & Deci, 2000b). Therefore, the self-determination theory has not only gained great force in various fields (Gagne & Deci, 2005) but also has been successfully validated from non-western cultures (e.g., Jang, Reeve, Ryan, & Kim, 2009).

A great many studies have focused on the pair of intrinsic motivation and extrinsic motivation. But given the meaning of intrinsic motivation, the majority of researchers assume naturally in their studies that this intrinsic motivation will benefit students more comparing with extrinsic motivation. For example, Baker (2004) found that when students are intrinsically motivated, they will be less likely obsessed by stress. Walker, Greene, and Mansell (2006) pointed out that intrinsic motivation, along with self-efficacy (Bandura, 1977, 1986) and academic identification (Osborne, 1997), all contributed significantly to meaningful cognitive engagement. Intrinsic motivation has also been recognized as one of the four key components for students' academic success (Linnenbrink & Pintrich, 2002).

By acknowledging the various benefits of intrinsic motivation, researchers have also focused on exploring the factors that can promote students' academic intrinsic motivation. For instance, building on constructivism (Piaget, 1972), Bybee (1997) designed a 5E model (Engagement, Exploration, Explanation, Elaboration, and Evaluation) with an attempt to engaging students in more higher-order thinking and learnings. Hassan and Rajab (2014) later found that classroom engagement and teachers' elaboration were more effective methods from the 5E model to promote intrinsic motivation. It has also been demonstrated that mastery-oriented goals have a significantly predictive effect on students' intrinsic motivation (Spinath & Steinmayr, 2012).
Some researchers, however, expressed their concern that extrinsic motivation can harm intrinsic motivation because various types of extrinsic rewards may deprive the true enjoyment of students’ study interest. Deci, Koestner, and Ryan (2001) said that when the outside sources of motivation are physical rewards, the intrinsic motivation level does get downgraded. However, other researchers stated that we should not always assume that extrinsic motivation is the reverse side of intrinsic motivation despite of its seemingly apparent distinction in definitions (Cerasoli, Nicklin, & Ford, 2014). Based on the results of a 40-year meta-analysis, Cerasoli et al. (2014) concluded that it is better to consider both aspects of motivation at the same time when predicting students' academic performance.

In this study, factors that influence academic intrinsic motivation compose the majority of my interested research questions. For example, this study is interested to see if different goal orientations can make a significant difference with regard to their academic intrinsic motivation. In addition, grade level and gender will be used as moderators to test the relationship between proximal goal setting and academic intrinsic motivation.

**Proximal and distal goal setting in goal setting theory.** Virtually every aspect of human being's lives is like a marathon journey. For example, a man who wants to be a professional programmer must go through extensive trainings from the very basic level of coding to the advanced level of data mining; a woman who expects to be a world-renowned dancer should start her exercise from her youth. However, is it sufficient to just carry out an overall goal throughout the lifespan? Students' academic lives are also a form of marathon, so to speak. Take the college stage in their lives as an example, can students maintain their optimal state of motivation all the way if they only hold an overall goal to graduate with outstanding grade point average (GPA)? The above-mentioned overall goals may serve as a grand direction towards one's
expectation. It's to the general public's common sense as well as goal setting researchers' claims, however, that we can't guarantee the occurrence of the right direction if not with proper small steps accompanied. Such small steps that need to be taken are called proximal goals in goal researchers' rationale.

In a real marathon contest, players usually speed up their run when they are aware of approaching the finishing line, which is exactly the gist of goal-gradient hypothesis inferred from animal experiment (Hull, 1932). However, it is not always the case when it comes to the progress of goal pursuit (Bonezzi, Brendl, & De Angelis, 2011). The first reason to be reckoned with is that there is usually no clear-cut finishing line for many goal pursuits like the physical one in a marathon contest. Next, the motivation to keep you running towards your goal is much more complicated than the morale in a real running contest. Academic setbacks, frustrations, anxieties, etc. are all stressful conditions that prevent college students from showing a beautifully increasing motivation curve. So, Bonezzi et al. (2011) suggested the adoption of reference points to monitor students' progress, which has borne the similar mindset with proximal goals from goal researchers.

In a review about more than three decades' history for goal setting theories, Locke and Latham (2002) summarized four mechanisms for goal setting. First, goals point at the direction people are going to, during which people's attention and effort have been seized. Second, goals give us energy and momentum to move forward. Higher goals require much more efforts to be devoted. In the meantime, higher goals' stringent requirements also serve as the touchstone for goal pursuers' persistence. Last, goals facilitate the occurrence of actions such as people seeking strategies proactively to finish their tasks.
Based on the above discussion, this study will look at if students' different goal orientations (mastery vs. performance goal orientations) can impact their goal setting behaviors. For example, one interesting aspect to see is what goal orientation type will be more likely to set up multiple proximal goals and what type will mainly use distal goals.

**Implicit sense of gratification.** The implicit sense of gratification (ISG) is the single mediator in this study to account for the relationship between proximal goal setting and students' academic intrinsic motivation. It is the degree of true happiness or satisfaction when students successfully accomplish their proximal goals within reasonable time limits. Such happy or satisfied feelings are not necessarily to go public but are kept inside to make students move forward. It is therefore assumed in this study that the high level of implicit sense of gratification mediates the relationship between proximal goal setting and students' academic intrinsic motivation.

Although the construct of implicit sense of gratification has never been investigated by previous studies, we can find several vicarious support from the literature. For example, the satisfactory feelings emphasized in Locke and Latham's (2002) virtuous cycle from finishing a personal goal to one's motivation level carry a similar train of thought. The completion of goals generates a degree of satisfaction while the incompletion breaks the chain of positive outcomes. With such satisfactions, people's intrinsic motivation got elevated and then they would love to accept next challenging goals.

Andrew Martin, who has laid his strong interest in personal best goals (Martin, 2006, 2011) over the years, also stressed the importance of self-satisfaction and pride when people finish challenging goals. His research has focused on identifying under which conditions goals truly make people satisfied once attained. The goals need to be specific enough to make moves.
The goals should also have proper difficulties. Both too easy or too hard ones could backfire people's original purpose. The goals should also exhibit ladder systems which means the next goal needs to have higher demand than the previous one. Martin's understanding about personal best goals also shed light on the making of proximal goals. Even though proximal goals do not have to be people's best goals such as the upward trend of next goals, they should also be specific in details and be reasonable in difficulty levels. So when people finish one proximal goal after another, they would know they are approaching towards their distal goal gradually. If the made proximal goals lose the attributes mentioned above, then people would unlikely experience the true feelings of gratification when complete.

In this study therefore, the implicit sense of gratification will be treated as a mediator to explain the relationship between proximal goal setting and academic intrinsic motivation. When students successfully finish their proximal goals, it is the implicit sense of gratification that explains the increase of their academic intrinsic motivation. When their implicit sense of gratification is low, it can be deduced that students either have trouble in making proper proximal goals or fail to finish them due to various reasons, thus their academic intrinsic motivation could be undermined.

**Key concepts integrated.** This study attempts to integrate the above-mentioned key concepts from three major motivation theories—the goal orientation from achievement goal theory, proximal and distal goal setting from goal setting theory, and academic intrinsic motivation from self-determination theory (see Figure 1). Though it is seldom to see the integration of these three theories from the extant literature, there are a couple of meaningful inquires that have been done to shed light on this study. For example, mastery goal orientation has been proved to be a direct predictor of students' academic intrinsic motivation (Spinath &
Steinmayr, 2012), which strengthens the assumption in this study that students with mastery goal orientation will have high academic intrinsic motivation in general. However, the level of academic intrinsic motivation for students with performance goal orientation cannot be assumed as low comparing with mastery-oriented students without certain considerations. Rawsthorne and Elliot (1999) claimed that competence feedback is a valid moderator for the relationship between performance goal orientation and academic intrinsic motivation. Given the effective feedback that acknowledges students' abilities, performance-oriented students can also boost their academic intrinsic motivation. Therefore it is interesting to find out in this study if there are any significant differences for these two broad groups of students in terms of their academic intrinsic motivation. Researchers also found that mastery-oriented students are much more likely to establish their personal goals in study (Taing, Smith, Singla, Johnson, & Chang, 2013), which lays the foundation for this study's assumption that these students would be more inclined to set up multiple proximal goals for their study. Taing et al. (2013) also stressed that goal setting is a mediator to the relationship of mastery goal orientation and academic performance. This study is therefore interested to investigate if goal setting is also a mediator to the relationship of goal orientation and students' academic intrinsic motivation.

**Purpose of the Study**

The purposes of this study are: 1) to explore goal orientation types' impact to students' academic intrinsic motivation; 2) to examine if goal orientation types can influence students' goal setting behaviors; 3) to testify the moderating effect of gender and grade level to goal setting's influence on students' academic intrinsic motivation; and 4) to investigate the mediating effect of implicit sense of gratification to proximal goals.
Research Questions and Hypotheses

Research question 1: Are there any significant differences for mastery- and performance-oriented students with regard to their academic intrinsic motivation?

Hypothesis to RQ1: There are significant differences between different goal-oriented students in terms of academic intrinsic motivation. Mastery-oriented students are assumed to have higher level of academic intrinsic motivation than those performance-oriented students.

Research question 2: Are mastery and performance goal orientations associated with differential proximal goal setting behaviors?

Hypothesis to RQ2: Mastery-oriented students would be more likely to set up multiple proximal goals because they can use them to keep track of their mastery progress. On the contrary, performance-oriented students would be less likely to schedule many proximal goals because they primarily care about the end results and not the intermediate process.

Research question 3: To what extent do gender and grade level of students moderate the relationship between proximal goal setting and their academic intrinsic motivation?

Hypothesis to RQ3: Female students with mastery goal orientations are assumed to set up proximal goals more often than males; graduate students are more likely to have proximal goals than undergraduate students.

Research question 4: To what extent does implicit sense of gratification mediate the effects of proximal goal setting on academic intrinsic motivation?

Hypothesis to RQ4: Implicit sense of gratification is assumed to be an important factor that does mediate the effects. Students with high level of implicit sense of gratification
gain more intrinsic motivation upon finishing proximal goals. On the contrary, students' intrinsic motivation will be harmed if their implicit sense of gratification is low.

Definition of Terms

The core constructs used in this study are defined here (see below). Both mastery and performance goal orientation are from achievement goal theory (AGT, Elliot & McGregor, 2001), proximal and distal goal setting are from goal setting theory (GST; Locke & Latham, 1990), and academic intrinsic motivation is based on the self-determination theory (SDT; Deci & Ryan, 1985). The implicit sense of gratification is a new construct defined in this study.

- **Mastery Goal Orientation (MGO):** Students focus on true understanding about subject and are willing to devote more efforts on their interested ones.
- **Performance Goal Orientation (PGO):** Students mainly target at good performance on competence-related academic activities such as tests and final grade without caring too much about regularly routine efforts.
- **Proximal Goal Setting (PGS):** Students' behavior of setting up short-term objectives which are regarded as building blocks for their final outcome.
- **Distal Goal Setting (DGS):** Students' behavior of setting up a relatively long-term goal towards certain outcomes with no necessarily specific plans in-between.
- **Academic Intrinsic Motivation (AIM):** Students' inner motive to initiate and keep focusing on their academic works voluntarily due to pure enjoyment which has very little or no relationship with any outside incentives such as external rewards.
- **Implicit Sense of Gratification (ISG):** A genuine psychological feeling of satisfaction and fulfilment when successfully finishing a reasonably-made task or goal within time limits.
that serves as an incentive for future goal-achieving commitment but not necessarily need to be expressed explicitly outwards.

**Significance and Organization of the Study**

This study contributes to the motivation study literature mainly in three ways. First, it will shed light on undergraduate students and graduate students' goal setting behaviors with regard to different goal orientations. Not only this question has scarcely been investigated in the literature, also the use of graduate students in the sample as comparing to undergraduate students is uncommon. In addition, it also attempts to address several closed-ended questions about proximal goal settings that are hardly to be answered by many quantitative studies. Second, this study will explore a new mediator to account for the relationship between proximal goal setting and students' academic intrinsic motivation. Third, by integrating the concepts from three major motivation theories (achievement goal theory, goal setting theory, and self-determination theory), this study builds a sensible connection to them. Especially, the goal setting theory has been widely used in work settings but limited in academic settings.

The remainder of this study is organized in the following way: Chapter 2 will conduct a critical review of related studies in literature; Chapter 3 gives an overview of the methods that will be used to address the research questions of interest in this study; Chapter 4 presents the results from the statistical data analysis; Chapter 5 will give an in-depth discussion about the results. References and instruments used in this study are placed after the five main chapters.
Chapter 2: Literature Review

This chapter provides a critical review of all the key concepts and theories in the literature that frames this study. This review is organized into the following sections.

The first section mainly describes the interplay between the three major theories about motivation (achievement goal theory, goal setting theory, and self-determination theory), providing readers a general idea of what kind of links have already been established in the literature and the necessity of connecting all three in this study. In the second section, I will start introducing the definitions of academic intrinsic motivation in the literature and continue with what studies have been done so far. It is also interesting to understand the traditional way of measuring academic intrinsic motivation because it is a key important dependent variable in this study. Next, a rationale will be given as to why this study only considers the intrinsic motivation instead of including the extrinsic motivation as well. Last part in this section explains why I use both undergraduate students and graduate students in this study. The third section focuses on the debate on the pair of proximal goal setting and distal goal setting. Readers can have an overall idea about the two types of the goal setting and thus have a better understanding of why only one type of them is favored in this study. The fourth section elaborates on the theoretical relevance from literature to support the formation of a key concept in this study, namely the implicit sense of gratification. Though this concept is first introduced in this study, it actually has rich foundation from the extant literature. The fifth section explains why this study is also interested in finding if gender and grade level can make a significant difference in explaining the variability in the relationship between proximal goal setting and academic intrinsic motivation.
The Interplay between Achievement Goal Theory, Goal Setting Theory, and Self-determination Theory

Achievement goal theory in the literature. Achievement goals are the ones established by students to demonstrate their capability in academics (Pekrun et al., 2009). Therefore, achievement goal theory (AGT) is a theory to account for students' academic behaviors from a cognitive perspective, in which students may hold several achievement goals towards the same academic activities (Dinger, Dickhäuser, Spinath, & Steinmayr, 2013).

Studies on AGT have been conducted for over three decades. Unlike any other specific goal one made to finish a task such as I want to complete this assignment by the end of this week, the achievement goal theory interpreted the goals from a more general sense (Elliot, 2005; Maehr & Zusho, 2009), which was their goal orientation. That is to say, what attitudes do students hold while learning their subject matters, i.e., the purpose goals (Sansone & Harackiewicz, 2000). From the initial stage of dichotomous framework which only contained the mastery and performance goal orientation, to the trichotomous framework which divided the performance goal orientation into performance-approach and performance-avoidance goal orientation, achievement goal theorists gradually settled down to a $2 \times 2$ goal orientation framework, which was mastery-approach goal orientation, mastery-avoidance goal orientation, performance-approach goal orientation, and performance-avoidance goal orientation (Elliot & McGregor, 2001; Huang, 2012; Murayama, Elliot, & Yamagata, 2011; Pintrich, 1999; Sideridis, 2005).

By embracing different goal orientations in their mind, according to achievement goal theory, students will demonstrate different behaviors in their study. Students with mastery-approach goal orientation will focus on their study to learn more without the fear of encountering
learning difficulties. Students with mastery-avoidance goal orientation also focus on their study to learn more but their drive to learn is to avoid the deficiency of mastery. So, we can interpret this type of goal orientation as the passive side of the mastery-approach goal orientation. When students go for performance-approach goal orientation, their study is to prove their learning competency. Students with performance-avoidance goal orientation, on the other hand, are afraid of being shown incapable of study, which can also be seen as the passive aspect of the performance-approach goal orientation (Elliot & McGregor, 2001).

Since the introduction of achievement goal theory, researchers have shown great interest in how different goal orientations can make a difference in students' academic outcomes (e.g., Bandalos et al., 2003; Wolters, 2004). The research findings, however, are mixed, which echoing people's different perspectives on this topic in the development of the theory.

Given the above descriptions of the four different goal orientations, it almost became a consensus immediately for researchers that mastery-approach goal orientation was the most favorable type among others and that it should bring the "best" results for students' academic achievement. Indeed, there were a bulk of studies that have testified the advantages of mastery-oriented goals which indicated people's dominant opinions on the mastery goals. For example, by studying junior high school students, Wolters (2004) found that students with mastery goal orientations showed more adaptive outcomes in many aspects such as their choice of academic activities, the effort and persistence level towards those activities. A study on college students found similar results, namely students with mastery goals were less likely to exhibit test anxiety compared to students with performance goals (Bandalos et al., 2003). Based on the results of two prospective studies and one short-term longitudinal study, McGregor and Elliot (2002) argued that there were an infinite number of positive influences brought by mastery goals, as there were
many negative influences for performance-approach goals and performance-avoidance goals respectively. But it is worth noticing that even though mastery-avoidance goal orientation also belongs to the mastery-oriented category, studies have shown many of its unfavorable effects. For instance, Sideridis (2008) warned that such type of goal orientation would cause unwanted emotion problems in overwhelmed achievement situations. So it has been suggested that students should avoid such type of goal orientation. Performance-avoidance goals could lead to state anxiety (Spielberger, 1972), which was the short-term tension invoked by certain situations, and thus pose a threat to students' task performance (Tanaka, Takehara, & Yamauchi, 2006).

With more and more studies being conducted, researchers were more critical regarding the value of respective goal orientations.

The first indicator was that mastery-oriented goals were no longer the most favorable type. In a meta-analysis of 90 peer-reviewed journal articles, Linnenbrink-Garcia, Tyson, & Patall (2008) found mixed results for what type of goal orientation has an effect on students' academic achievement. Based on their survey, about 40% of the studies concluded that mastery goals showed positive influence to students' academic achievement, while a similar amount of studies credited such positive effect to performance goal orientations. To their surprise, there were only 20% of students in favor of mastery goal orientation, 10% for performance goal orientation. All the remaining percentages indicated no clear category for either type. So, the authors concluded that both types of goal orientation could be conducive to students' academic achievement.

The second indicator was that researchers tended to consider the benefits of each goal orientation type under different situations. For example, Winters and Latham's (1996) study on business college students found that if simple tasks were assigned, better performance was
obtained under performance-oriented goal. Mastery-oriented goal, however, suited better for complex tasks, in terms of better performance, improved self-efficacy, and effective use of task strategies. Winters and Latham (1996) explained that the complex task usually contained the knowledge and procedure that were beyond the grasp of average students. Thus a mastery-oriented goal rather than performance-oriented goal could draw more attention to the learning of how a complex task has been done and thus increase their self-efficacy when facing similar complex tasks afterwards. This study has taken into account task difficulty when thinking about goal orientations function. By examining the performance-approach goal orientation solely, Midgley, Kaplan, and Middleton (2001) also warned that cautions are needed with regard to explaining its function. They claimed that the performance-approach goal orientation also resulted in good and adaptive outcomes for academic achievement under the right circumstances.

The third indicator was that some researchers started to question the advantages of mastery-oriented goals that were once to be a flawless type. For example, Senko and Miles (2008) explained some possible reasons in their study why the mastery-oriented students could undermine their academic performance. According to their study, mastery-oriented students would mainly distribute large amount of efforts on their interested subjects while ignoring the relatively non-engaging topics that were also essential parts on the formal tests. On the contrary, performance-oriented students would be more sensitive to this effort distribution issue. For students with performance goals, only when they were afraid of failures can their intrinsic motivation be harmed (Elliot & Harackiewicz, 1996).

The fourth indicator was brought by the cross-cultural researchers who intended to know if the goal orientations were immune to the influence of any cultural beliefs. Interested to test if the performance-avoidance achievement goal was always the type students should avoid even for
non-western cultural beliefs, King (2016) conducted a cross-cultural study that getting students with collectivist ideology involved comparing with western students whose beliefs represent individualism. He found that collectivism was a moderator for the effects of performance-avoidance goal on students' learning strategies and intrinsic motivation, though the effect size of the study was not large. So he concluded that mastery goal orientation was still the type teachers should promote to students.

The fifth indicator was the studies on the consistency of students' goal orientations. Given the obvious benefits of having mastery-oriented goals in students' lives, people would automatically assume that students would follow their good habits all the time. However, it was not always the case. For example, Lieberman and Remedios (2007) noticed that college students tended to gradually switch to performance-oriented goals when they progressed to junior and senior years. The authors pointed out that the increasing learning pressures and desire to graduate with remarkable grade records preempted the continuation of mastery-oriented goals.

The sixth indicator was researchers' thinking on the attributes of goal orientations themselves. Some said goal orientation was an individual trait, which was more stable as reflected in people's personality. Others maintained that goal orientation was a situational state that was contingent on different contexts. Button and Mathieu (1996) argued that it was better to consider goal orientation as containing both components. A person may resort to their habitual goal orientation for any new tasks but their final adoption may also depend on specific situations.

The above critical thoughts have made achievement goal theorists reconsider the debate on which type of goal orientation can lead to the best output of motivation. Barron and Harackiewicz (2001) conducted two rigorous experiments with attempt to addressing the question. They found that undergraduate students acknowledged the benefits of the two major
types of goal orientation simultaneously, in which each can make their motivation move forward. So the authors suggested that a multiple goal perspective may be a better remedy for the conceptual problem plaguing this line of research. By using new participants and different settings later, they further confirmed benefits of such a perspective (Barron & Harackiewicz, 2003). The benefits of having multiple goal perspective have also been proved from studies on Singapore students (e.g., Liu, Wang, Tan, Ee, & Koh, 2009). Therefore, given this new perspective, it will be more interesting to see if different goal orientations can make a significant difference in terms of students' academic intrinsic motivation and their goal setting behaviors as indicated in the first two research questions in this study.

**Goal setting theory in the literature.** In goal setting researchers’ eyes, human beings are driven by all sorts of task goals (Sansone & Harackiewicz, 2000) to get things done properly. If people do things aimlessly, they would not savor the happiness of completion. What makes a goal so effective is the "discrepancy-creating process" that incurs mismatch with people's current performance (Latham & Locke, 2006). In fact, a plethora of studies have confirmed its effectiveness in various tasks done by people around the globe. A uniform conclusion was that people's performance was significantly correlated with specific and high level goals. People's performance still remained high even if the goals were assigned by others or simply joined with others’ as long as they were reasonable ones that can be done within time limits.

Although its influential impact on motivation and performance, the goal setting theory has seldom been applied to academic settings (Travers, Morisano, & Locke, 2015). This has given education researchers opportunities to integrate goal setting into their studies. In addition, Locke and Latham (2006) stressed more than once that goal setting theory was quite open to the integration of other theories, which has made the integration of the three motivation theories in
this study possible. A good example illustrating the effectiveness of goal setting in academic setting is from a study on universities' attrition rates (Morisano, Hirsh, Peterson, Pihl, & Shore, 2010). Morisano et al. (2010) noticed a staggering 25% attrition rate among four-year universities. Among the various reasons, poor academic progress and lack of clear goals and motivation stood out as primary ones. After a four-month goal setting intervention, they found that students in the treatment group showed significant improvement in academic performance compared to the control group. So, their study has confirmed the clear benefits of goal setting that when specific goals have been set, people's performance can be improved remarkably, during which their working enthusiasm was invoked and people were more inclined to explore and use efficient strategies.

However, Latham (2004) has warned us about several downsides with regards to goal setting as well. For example, in some situations, people may overlook the goal quality when pursuing the quantity, or vice versa. In other situations, people may feel struggled when faced with conflicting goals. Therefore, Latham and Locke (2006) published an article later to summarize the benefits and pitfalls of goal setting. They said that the obvious advantages of goal setting will not stand out if the pitfalls have been neglected. For instance, people's performance will not be high if they are assigned a task above their current competency level. A safe corollary can be drawn that if students are given a project beyond their current ability level, they would be unlikely to submit it with high quality. Another pitfall is that too many goals may increase people's burden instead and thus cause stress. Students may feel overwhelmed as well if they have to deal with all sorts of goals each week rather than only have a compact list of goals that make their lives easier and efficient.
The interplay between achievement goal theory, goal setting theory, and self-determination theory. This study attempts to integrate several key concepts from three major theories revolving around motivation (achievement goal theory, goal setting theory, and self-determination theory) to answer my interested research questions. The extant literature, however, has mainly focused on the integration of two theories but rarely on three.

Senko and Harackiewicz (2005) explored the relationship between achievement goal orientations and goals regulation when students received feedback about the competence level. Based on their observation, students tended to adjust their goal orientations if their perceived competence level has fallen out of their comfort zone. For performance-oriented students, they would switch their performance-approach goal orientation to performance-avoidance type if they felt that their competence level was not high. Such goal fluctuation could also happen on mastery-oriented students. For example, when a mastery-oriented student encountered a fiasco on an exam, he or she might lower the original desire of mastering the knowledge accordingly. Senko and Harackiewicz (2005) concluded that performance-approach goals were more suitable for success on tests while mastery-oriented goals were apt to improve one's interest on subject.

Even though achievement goal theory and goal setting theory has its own origins separately around 1990s, it was not until 2004 that Seijts, Latham, Tasa, and Latham (2004) took the initiative to connect these two similar yet different theories. By assigning an extremely difficult task to business school students, the researchers ruled out all other explanations but one's competency to solve it. They found that when participants set up a learning goal, the correlation between their mastery goal orientation and task performance was quite significant.

Some other researchers established the link between achievement goal theory and goal setting theory by including other constructs. For example, in a longitudinal field study, Cron,
Slocum Jr., VandeWalle, and Fu (2005) involved students' intensity of negative emotional reactions on the occasion of failure to achieving their initial performance goals. One key finding was that the negative emotional reactions accounted for the relationship between an avoiding goal orientation and goal setting. It is safe to say that when students adopt either mastery-avoidance or performance-avoidance goal orientation, they would easily generate negative feelings such as frustration once hitting a setback, and thus impact their subsequent action of goal setting. Their study also revealed that when students had high level mastery-oriented goal orientation, they would not be easily disrupted by negative emotions even if their subsequent goals were to do repetitive tasks. Therefore, the mastery-oriented goal orientation represents an adaptive response pattern.

In a longitudinal study on college students, researchers have found that the learning goal orientation was highly correlated with setting higher personal goals and maintaining higher academic performance over time (Taing et al., 2013). Taing et al. (2013) also noticed that goal setting can mediate the relationship of learning goal orientation and academic performance.

Although the achievement goal theory and self-determination theory each has their own strength in explaining academic motivation and success, studies that combined these two were quite limited (Ciani, Sheldon, Hilpert, & Easter, 2011). Ciani et al. (2011) was interested to investigate what makes people set up a goal and then keep going towards the goal. In their longitudinal study on college students, Ciani et al. (2011) found that the satisfaction of the psychological needs for autonomy and relatedness could predict students' motivation in class and further forecast their mastery-approach or mastery-avoidance goals. They also found that once their autonomy need has been supported from their teachers, the students' mastery-approach goal orientations could stay throughout the entire semester.
Investigating on German high school students, Spinath and Steinmayr (2012) found that the mastery-oriented goals were a direct predictor of students' academic intrinsic motivation. The authors argued that the mastery goal orientation can also help students with low self-efficacy to rebuild their confidence in study because such students would regard their current low ability level as needing more learning opportunities. Their study has shed light on the importance of having mastery goals to low achievers.

In a meta-analysis investigating the effect of either performance or mastery achievement goal orientations on students' intrinsic motivation, Rawsthorne and Elliot (1999) found that performance goal orientation did harm students' intrinsic motivation under some conditions. One condition was that whether students had acquired "confirming competence feedback" from others or not; the other was that performance-approach or performance-avoidance goal orientation made a difference. This study revealed the moderating effect of competence feedback. If students can get feedback acknowledging their high ability level, then there was no doubt that performance goal orientation can also raise intrinsic motivation. On the other hand, when the feedback on their competence suggested their weak ability, students would lose their intrinsic motivation to move forward.

The interplay between intrinsic motivation and goal setting, however, was uncommon to see in the literature. Ever since the introduction of intrinsic motivation in self-determination theory (Deci & Ryan, 1985), goal setting researchers have noticed its close relation with this concept. Some goal setting researchers argued that people's intrinsic motivation could be harmed if they were under assigned goals. However, such argument has been disapproved due to no consistent findings (Locke, 1996).
Summary. More than three decades' development has witnessed people's evolving perspectives on goal orientation. More and more studies have been done to test the validity of different types of goal orientation and its relationship with other constructs. The goal setting theory's openness to integrate with other theories has set a good foundation to explore the interested research questions in this study.

Academic Intrinsic Motivation

Definition of academic intrinsic motivation. Intrinsic motivation, which is an integral component in self-determination theory, is a part of human nature that accounts for many of our behaviors such as seeking novel and challenging things, stretching our abilities, and inquiring the unknowns (Ryan & Deci, 2000a). People who have strong intrinsic motivation are willing to devote more energy to the task because of their pure interest. When we refer to the intrinsic motivation by students in academic settings, we can call it academic intrinsic motivation. Hofer (2006) claimed that academic intrinsic motivation can facilitate students' understanding towards concepts, improve their academic engagement in class, inspire creative ideas, and make them willing for accepting more challenging tasks.

By integrating previous researchers' understandings about academic intrinsic motivation, Gottfried (1985) summarized the consensus about its connotation as "the enjoyment of school learning characterized by an orientation toward mastery; curiosity; persistence, task-endogeny; and the learning of challenging, difficult, and novel tasks."

Researchers have also identified three dimensions of academic intrinsic motivation (Vallerand et al., 1992). First is intrinsic motivation to know, which means students will experience genuine pleasure while learning materials. This dimension will invoke students' curiosity to explore knowledge and thus set up their mastery goals as their learning plan. Next is
intrinsic motivation to accomplish, which means students will place more emphasis on their knowledge mastery level rather than on grades. This dimension has also been called achievement motivation. Students are more willing to demonstrate their competency to compete against themselves for higher achieving goals and thus to expect larger satisfaction. Last is intrinsic motivation for stimulation. Students high in their intrinsic motivation for stimulation are more eager to seek pleasure from various aspects such as the excitement coming from a heated group discussion in classroom. Thus, their academic engagement is highly powered and driven by this dimension.

**Previous studies on academic intrinsic motivation.** Intrinsic motivation has drawn a lot of researchers' attention since its inception. Researchers have made a lot of endeavors from their own expertise to look at the construct. For example, some studies focus on what factors could trigger intrinsic motivation: By testing the 5E instructional model proposed by Bybee (1997) using samples in Malaysia, Hassan and Rajab (2014) discovered that engagement and elaboration would effectively trigger students' intrinsic motivation comparing with other Es such as exploration, explanation, and evaluation. Their findings mainly captured the teachers' efforts to seize students' attention and provide nourishing environments to foster students' positive transfer ability which means students were able to apply the knowledge to other situations.

Some researchers were interested in the benefits of intrinsic motivation. For example, Baker (2004) found that when students had high intrinsic motivation, they were having less degree of perceived stress as reported. However, more maladjustment issues such as higher tension and emotional anguish in learning were often seen among students with little or no motivation. Other researchers combined intrinsic motivation with other factors together as predictors for students' academic performance. For instance, Turner, Chandler, and Heffer (2009)
found that intrinsic motivation, along with self-efficacy and authoritative parenting styles were predictive for college students' academic performance.

Achievement goal researchers tended to explore the relationship between achievement goal orientation and intrinsic motivation. For example, Dinger, Dickhäuser, Spinath, and Steinmayr (2013) placed goal orientations as mediators to connect students' distal motivational dispositions to intrinsic motivation and academic achievement. They found a positive correlation between mastery-oriented goals and intrinsic motivation but a negative correlation between performance-oriented goals and intrinsic motivation. The reason was that students with mastery-oriented goals would like to gradually improve their ability through intensive involvement with tasks while students with performance-oriented goals merely focused on avoiding showing their incompetence so that they would not be likely to have task engagement.

Students with extremely high academic intrinsic motivation also caught the attention of researchers in gifted education. Gottfried, Gottfried, Cook, and Morris (2005) credited such students as characterized as motivationally gifted, responsible for their academic success and high self-concepts. Based on their studies on adolescents, they argued that gifted motivation was a distinct construct against gifted intelligence. Therefore, it is been suggested that those who were identified as having gifted motivation should also be included in the gifted programs.

**Traditional ways of measuring academic intrinsic motivation.** Although the definition of academic intrinsic motivation is not a complicated one, how to measure it scientifically poses a lot of questions and stirs different ideas. Throughout the history of studies on academic intrinsic motivation, researchers have generated multiple ways to measure it. However, they all diverged in their perspectives to look at it and assessing it, which perfectly mirrored the
complexity of this issue as an innate drive inside human nature. Below are some measures that have been used frequently in the literature.

Perhaps the most well-known and widely-adopted measure for academic intrinsic motivation is the Academic Motivation Scale (AMS; Vallerand et al., 1992), which was a direct translation from a French scale EME (Echelle de Motivation en Education). The AMS contained the measures for three types of motivation: intrinsic motivation, extrinsic motivation, and amotivation. It attempted to know how to account for people's choice to have a college degree in terms of motivation. After its introduction, many studies have been done to confirm its validity. For example, Vallerand et al. (1993) added evidence on the concurrent and construct validity for AMS. Showing great interest on the application of AMS, Cokley himself (2000) and colleagues (Cokley, Bernard, Cunningham, & Motoike, 2001) kept working on the validation of the scale by checking the construct validity and other psychometric characteristics by using multiple types of samples. However, Cokley (2015) has recently found some degree of inconsistency when he used black college students alone on its validation. Other researchers have shown their interests to test its application to different cultures. For instance, using the undergraduate schools in Ghana, west Africa, Akoto (2014) confirmed the scale's wide generalization in non-western context. Similar validation study has also been done in Italian context (Alivernini & Lucidi, 2008) by using high school students.

Considering how to design courses to fully stimulate students' learning motives from instructors' perspective, Jones (2009) proposed a MUSIC model to aid instructors to apply the motivation research into their instructional practices. The MUSIC acronym stood for eMpowerment, Usefulness, Success, Interest, and Caring. This gave instructors the general guidance that they need to facilitate choice and learning, enhance confidence and interests, and
create class cohesion. Building on this conceptual framework, Jones (2012) proposed and validated a 26-item MUSIC model of academic motivation inventory (MUSIC Inventory). Based on the two-phase validation results, this inventory was a valuable hands-on tool that can be used by instructors in any progress of their courses.

Elliot and Church (1997) proposed eight items to assess students' intrinsic motivation towards how they felt about class. Students can select from strongly disagree to strongly agree based on whether they think the class was interesting overall or how they enjoyed the class. On their revision of achievement goal questionnaire, Elliot and Murayama (2008) tested that this eight-item survey returned a very good reliability index (Cronbach's $\alpha = .92$).

Reeve and Sickenius (1994), on the other hand, designed their activity-feeling states (AFS) scales to measure students' intrinsic motivation based on the three psychological needs from self-determination theory. This 13-item scale, with the dimension of tension added later on, measured how participants felt about certain activities based on a seven-point Likert-type scale. With great reliability and validity evidence from the studies, this survey has become a valuable tool to assess students' three psychological needs to predict their intrinsic motivation (e.g., Jang, Reeve, & Halusic, 2016; Reeve & Lee, 2014; Reeve & Tseng, 2011).

The Intrinsic Motivation Inventory (IMI) is claimed to be a direct assessment of intrinsic motivation itself (Plant & Ryan, 1985). It was a multi-dimensional measurement that contained seven subscales to intrinsic motivation and self-regulation. The overall 45 items have been distributed unequally to the seven subscales, but there were also different compact versions of IMI to suit the needs in different studies. Using a basketball free-throw shooting game, the IMI has been reported having adequate reliability (McAuley, Duncan, & Tammen, 1989). Jones and
Skaggs (2016) also applied partial component of IMI as one of their instruments to validate their MUSIC Inventory (Jones, 2012).

The Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & Mckeachie, 1993) is another traditional measure of motivation. This 81-item pool, which has been tested as a robust survey by the authors, consisted of motivation and learning strategies as its two subscales. Some researchers have used the whole survey in their studies to explore the relationship between undergrads' self-efficacy and academic achievement (e.g., Komaraju & Nadler, 2013). Other researchers have adapted some survey questions to suit their unique study needs (e.g, Artino Jr. & Stephens, 2009; Bye, Pushkar, & Conway, 2007).

To look at student goals and personal strategy, Shia (1998) created an inventory entitled as Academic Intrinsic Motivation. This inventory contained two factors for intrinsic motivations and four for extrinsic motivations. Rated on a 7-point Likert-type scale, the entire inventory also returned a good reliability index with Cronbach's alpha .86. One example use of this survey was the study on student teachers who were highly likely to become professional teachers after graduation (Uyulgan & Akkuzu, 2014). According to their study, the AIM scale returned a four-factor structure and proved to be a valid measure.

**Why focusing on academic intrinsic motivation exclusively.** According to the elaboration of the two broad types of motivation from self-determination theorists, people sincerely believe that both the inside and outside motivators can make students successful in academia. The inside motivators, which is the intrinsic motivation, can make students willing to devote their efforts on their own will. Teachers and parents don't need apply any extra push for the intrinsically-motivated students. The outside motivators, which is the extrinsic motivation, can also drive people forward in order to get something desirable. For academically unmotivated
students, in particular, the implementation of extrinsic motivation by teachers and parents may bring additional benefits (Hidi & Harackiewicz, 2000). However, this study only focused on the intrinsic motivation for the following reasons.

Ryan and Deci (2000a) argued that the extrinsic motivation, which were often regarded as reverse side of intrinsic motivation on the surface, was in effect blurry in its boundary as a major source. People can hardly tell if the motives coming from outside of themselves were a pure control from outsiders or were merged as part of one's self-regulated behaviors. By carefully examining the different dimensions for both intrinsic motivation and extrinsic motivation based on Vallerand et al.'s (1992) claim, Cokley (2000) found that the perceived difference between the two major types of motivation was actually not quite obvious. A 40-year meta-analysis revealed that intrinsic motivation and extrinsic motivation were not a pair of natural rivals against each other but rather can work in concert to enhance students' academic performance (Cerasoli et al., 2014).

**Why undergraduate and graduate students.** Speaking of motivational studies, researchers all have their own interested cohort to investigate. For example, some have their foci on children in elementary schools (e.g., Furrer & Skinner, 2003; Miserandino, 1996). There are even inventory designed particularly for children's academic intrinsic motivation study (Gottfried, 1985). Some researchers have their resources on secondary education students (e.g., Alivernini & Lucidi, 2008; Spinath & Steinmayr, 2012; Wolters, 2004). Most studies, however, have chosen the college students as their primary target to study. Such subconscious agreement among the majority of researchers was not without reasons.

Researchers have long noticed the wide-spread problems existing in universities, in which many are facing an uninspiring number of attrition rates each year (e.g., Devonport &
Lane, 2006; Lloyd, Tienda, & Zajacova, 2001). Undoubtedly, researchers admitted that there are practical constraints for some groups of students going into college such as financial burdens, also constraints for current college students finishing their degree such as academic pressure in higher education (e.g., Allen, 1999; Chemers, Hu, & Garcia, 2001), but more have switched their attention to psychological reasons such as lack of motivation and study strategies (e.g., Hsieh, Sullivan, & Guerra, 2007). Hsieh et al. (2007) pointed out that self-efficacy and mastery goal orientation were the two leading factors to foster college students' academic success, while the performance-avoidance goals had a negative influence. Therefore, the authors concluded that both teaching and administrative staff need to help students establish the right learning attitude and strong beliefs to their academic success. In Lieberman and Remedios's (2007) study, however, they found a significant downward trend in terms of motivation to master knowledge from being freshmen, sophomore, junior, and senior college students. When at a more senior level, students were more driven by achieving higher grades rather by true enjoyment of study. Other researchers' strong interest in college students were due to the critical phase students found themselves in. Its common sense to the public that primary and secondary education lay the foundation for higher education, but it's the higher education that sets the tone for most people's future career, and even for one’s entire life. Higher education, however, also means more demanding requirements for most students compared to primary and secondary education. College students may face multi-facet problems throughout their college lives. For example, some portion of freshmen may find themselves difficult to fit in the college level studies (Bradley, 2012), other undergraduates may have various emotion issues when dealing with pressures and anxieties (Beard, Clegg, & Smith, 2007).
The above analyses have made studies on college students meaningful and practical. However, there are not many studies targeting graduate students. The following aspects could be the possible reasons behind this situation.

First of all, graduate studies often forecast the future career directions. Graduate students should have much clear career goals than undergraduates once they are in graduate school. Guided by their career goals, graduate students are supposed to be more intrinsically-motivated in their studies. Second, due to physical and mental maturation, graduate students are seasoned soldiers in their long-term academic battlefield. Therefore, they should demonstrate a high level of persistence and resilience while in study. The problem of depression, setbacks, exam anxiety, and peer pressure should be handled properly rather than being disruptive. In addition, their accumulated effective study habits would also lend themselves to academic success. Third, the number of graduate students is relatively small in a university compared to undergraduates, which will pose a potential threat to the statistical power if the sample size is not large enough. So, this situation also limits the number of quantitative studies using graduate students.

Hegarty's (2010) study is an exemplary one using graduate students in research. In the study, he investigated whether graduate students also suffered from the decrease of intrinsic motivation because of stressful situations. By utilizing the Academic Motivation Scale (AMS; Vallerand et al., 1992), which has never been validated for graduate students before, Hegarty recruited 240 master students from education and business departments to test the consistency of the scale. The results have confirmed the viability of the AMS on graduate students as well but also have returned a truth that master students in the study were not intrinsically-motivated as people assumed to be. So he suggested that the motivation studies should also expand on graduate level students with more diverse majors involved.
**Summary.** Academic intrinsic motivation has no doubt stimulated the interest of many educational researchers because it often brings numerous positive outcomes to students. Those with high intrinsic motivation have also been called as motivationally gifted by the gifted education researchers. The existence of multiple versions of surveys to measure academic intrinsic motivation in the literature exactly reflect the people's great interest in its research value.

**Proximal vs. Distal Goal Setting Debate**

Although the goal setting theory has been widely accepted in many areas, the debate about whether distal goal or multiple proximal goals is a better choice has never ended. Some researchers also added "do-your-best" goal to the debate because it is also common to see in our daily lives.

In the early 1980s, researchers held different attitudes on whether proximal or distal goals can increase people's intrinsic motivation. By assigning participants a series of enjoyable tasks to have a relatively high starting point of task interest, Manderlink and Harackiewicz (1984) found that proximal goal setting did make participants experience more positive goal attainment expectations and higher perceived competency, but it was the distal goal setting that enhanced participants' overall intrinsic motivation compared with proximal goal group and no goal group.

Later on, more and more researchers started to notice the benefits brought by the combination of both distal and proximal goals. For instance, Seijts and Latham (2001) tested the combination of proximal goals with either learning distal goals or outcome distal goals in a laboratory setting. The participants were still divided into one of the three groups: do your best group, distal goal alone group, and distal and proximal goal group. They found that participants' performance as well as their level of goal commitment was the highest when they were assigned
a specific, difficult learning goal. However, for the combined goal group, if their proximal goals were also outcome goals, the overall performance was not as high as expected. Therefore, the authors suggested that only the combination of proximal learning goals with distal learning goals can lead to the implementation of various task-related strategies which can further lead to high performance.

When a group of young adults were assigned a paid task to make toys, Latham and Seijts (1999) also divided them into three groups. One group made their "do your best" goal, one group was told to have a distal goal only, and the last was assigned to have proximal goal and distal goal simultaneously. Under the incentive of getting paid by the number of completed toys, the group with "do your best" goal earned significantly more money than the distal goal only group, but was overshadowed when compared to the combined goal group. The participants in combined goal group adopted better marketing strategies from purchasing materials to determining the profit margin for each toy. In the meantime, their perceived self-efficacy has been greatly increased.

Similar evidence was also gained from the study on nurse surveyors to improve their medical reports accuracy (Weldon & Yun, 2000). Comparing with one group with long-term goal only and one group with mixed goals, Weldon and Yun found that the group with the combination of short-term and long-term goals were more willing to set up difficult goals and were more likely to have better performance.

Others argued that we should consider the context when talking about the distal and proximal goals. For example, through examining both lab and field experiments, Huang, Jin, and Zhang (2017) found that people's motivation was dependent on different situations. If people found that their distal goal was within reach, then the establishment of multiple sub-goals could
increase the possibility to materialize the distal goal and thus lead to greater motivation. On the other hand, the authors found that when people placed more weight on the value aspect of finishing a goal, it was the distal goal rather than proximal goals that directed their source of motivation for action.

**Theoretical Relevance for Implicit Sense of Gratification**

**Explanations of the definition for implicit sense of gratification.** The implicit sense of gratification (ISG) has been defined in this study as a genuine psychological feeling of satisfaction and fulfilment when students successfully finish a reasonably-made task within time limits that serves as an incentive for future goal-achieving commitment but not necessarily need to be expressed explicitly outwards.

Several crucial parts need to be understood about this construct. First of all, the sense of gratification is a genuine feeling of satisfaction and fulfilment. When students finish a task that is above their current ability level or the task itself is a tedious and time-consuming one, the feeling upon finishing the task is more of a relief rather than a genuine satisfaction and fulfilment. Students all have a certain time to face a task they have never done before such as a presentation after reading an assigned scientific journal article. If they are struggled to understand the content, it will be less likely for them to deliver a presentation that is well-articulated. In this case, when they finish this type of task the feeling of relief is outweighing the feeling of true gratification. In other situation, when students finish a low intellectual but tedious task such as sorting out related articles from hundreds or thousands they will also not experience the true fulfilment. On the other hand, some students may interpret finishing some sort of task as their accomplishment and thus generate the feeling of pride, which is also not the connotation of true gratification.
Second, the task should contain reasonable difficulty level. If the task is too hard as perceived by students, they would either evade it or manufacture it in a rough and slipshod way. The feeling of frustration would arise if they receive negative feedback on their performance. Few may strive to conquer it but once again fall under the feeling of relief rather than gratification. On the opposite, if the task is regarded as super easy, students can have it done with a breeze. But the joy after that would hardly be a genuine happiness.

Third, the true feeling of satisfaction should come from the completion of carefully crafted goals rather than any randomly made ones. This means that the carefully crafted goals are the steady checkpoints for students' study progress. If the goals are made at the spur of the moment or at the thought of some left behind tasks, students will feel the tension during the process and feel the relief after it.

Fourth, the true feeling of satisfaction is related to finishing the task within time. If a student used extended time to finish it in the end, the feeling would be undermined. It's not uncommon to see students procrastinate on the tasks. Some would only be ready for the task when they are in good mood. Another situation is students only manage to finish the task the minute before the deadline. Either way, the true satisfaction cannot be gained.

Fifth, the true feeling of satisfaction has little to do with the initiator of the goals. The reasonably-made goal could be self-initiated or designated by others which usually are professors or advisors of students. It's easy to understand students' feeling of true gratification when they successfully finish a self-made goal within time. But students' academic lives are bursting with tasks from their professors, either they are assignments or projects. Many would prioritize such tasks over their own's. The students, however, can still smell the feeling of gratification if those tasks can be done with efficiency. It's assumed that students who can juggle their own self-made
goals with professors' can have high-level of feelings of gratification because it is brought by the amount of goals and the finishing quality of the goals.

Lastly, the sense of gratification is an implicit feeling that is not necessarily shared with others. When students successfully mark their completion towards some goal, they feel the extent of satisfaction about their competence and other good attributes such as stamina and persistence during which they don't have to share such feelings with others. First, this implicit connotation bears resemblance to the construct of intrinsic motivation that the satisfaction and inner motivation are kept inside of students themselves. Another similarity is to the sense of flow (Csíkszentmihályi, 1990) that only the operator himself can truly savor the genuine feelings. Second, the sense of gratification is implicit because when students making their own short-term goals, there are actually no fierce contest against others but only self-competition. Students have their own individualized goals that others may have their distinct ones as well, so each works on their own speed of goal completion. Third, the sense of gratification is implicit is due to each individual's own pace. Students have different levels of competence, diverse learning skills, and various levels of persistence. If facing with a same task assigned by a professor, some may use just one day to finish but others use three. However, they both can feel the sense of gratification as long as the goal to accomplish the task falls under their own unique pace and progress. The students who use longer time also recognize their current ability level and suit their own development.

**Implicit sense of gratification is a mediator.** According to Baron and Kenny’s (1986) clarification about mediation and moderation, mediator is a link to explain the relationship between two concepts. In this study, the implicit sense of gratification is hypothesized as a
mediator to account for the relationship between proximal goal setting and students' academic intrinsic motivation.

When students successfully finish a proximal goal, they would feel the genuine happiness about their accomplishment, which is supposed to boost their intrinsic motivation in academics. During the process, both students' goal management and goal commitment have been put to test. When a series of proximal goals have been successfully accomplished, we can safely infer that student's academic intrinsic motivation should remain on a high level continuously. When a student has run into hiccups towards their goal completion, the degree of the implicit sense of gratification is assumed to drop, which leads to a chain reaction to an effect of decreased academic intrinsic motivation. Therefore, the implicit sense of gratification serves as a mediator to better explain the relationship.

**Theoretical relevance from literature.** Although the implicit sense of gratification is a new concept brought up in this study, it does have a rich origin from previous studies in the related literature. Below I will talk about several similar constructs in the literature that lend the theoretical support to the concept in this study.

As early as 1950s, Atkinson (1957) has explored three key variables to account for people's preference on one action over the others and the following persistence on that action, which are motive, expectancy, and incentive. According to his understanding, the motive is in effect people's natural tendency to seek some degree of satisfaction contingent on the attainment of their expected incentives. Those feelings of satisfaction include the feeling of pride in terms of task completion, the feeling of acceptance by others, and the sense of competence. The concept of implicit sense of gratification also is an extent of satisfaction but has its own unique
contingency on short-term goals completion, from which students have the motivation to finish subsequent short-term goals and lead to their ultimate academic success.

The researches on academic emotions shed some light on the support for the implicit sense of gratification as well. Academic emotions contained enjoyment, hope, pride, relief, anger, anxiety, shame, hopelessness, and boredom (Pekrun, Goetz, Titz, & Perry, 2002). Among these, the enjoyment of learning, which was regarded as a positive emotion, benefits the improvement of students' academic motivation. The implicit sense of gratification also belongs to the general domain of enjoyment, but with a distinct emphasis on its antecedents of proximal goal setting and completion. Thus, in general, the high level of implicit sense of gratification can no doubt have a ripple effect on students' academic intrinsic motivation.

The implicit sense of gratification can also find similar theoretical inferences from self-concordance model (Sheldon & Houser-Marko, 2001) which involves a particular lens on motivation from the self-determination theory (Deci & Ryan, 1985, 1991) to people's self-initiated goals. According to the self-concordance model, when people have less control on their self-made goals they are prepared to achieve, they will have much lower chance to accomplish the goals smoothly, thus etching away their intrinsic motivation. An example would be that students are often overwhelmed by professors' assignments. When that happens, some students would tend to convert those tasks into their self-made goals. However, the true feeling of gratification when finishing proximal goals would diminish because professors' tasks are often treated with higher priority.

The reasonable task difficulty level in the meaning of the implicit sense of gratification has also been echoed by the sense of flow (Csíkszentmihályi, 1990), which states a natural outcome for being totally immersed in a task. However, such sense of flow should not be gained
with either demanding or simple tasks that can be done with a breeze. According to Csíkszentmihályi, the genuine feeling of satisfaction should only come from the completion of the task that taxing one's current level of capability (Csíkszentmihályi, 1990, p. 3), during which one can have the "optimal experience". His idea of sense of flow is in concordance with the key element of the implicit sense of gratification which both stresses the value of appropriate task difficulty level. However, the concept of implicit sense of gratification carries more proximal goal targeted properties. For instance, the proximal goals should be made with careful thought rather than being made hastily even though it could also stretch out one's capabilities. In addition, the concept of sense of flow does not stress the reasonable time limits for finishing a proximal goal. One could get easily into the state of enjoyment when doing some task suits their appetite, but the implicit sense of gratification requires the proximal goals to be done in a timely manner as well.

The summary work about what goal setting theory has done for over 35 years from Locke and Latham (2002) mentioned a virtuous cycle from the satisfaction of completing one's personal goals to their level of motivation. According to their logic, the completion of personal goals elevated the degree of satisfaction, while the incompletion leads to dissatisfaction. When person has accumulated more satisfaction they would raise the difficulty par with the next task. Once conquering the harder goals, one's motivation will be further enhanced, creating a pattern of an upward spiral for personal success. Few years later, in another summary work about goal setting theory, Latham and Locke (2007) mentioned a high performance cycle framework for people to better understand motivation in the workspace, from which we can clearly see a linear positive relationship from goals to satisfaction and to task commitment. Piggybacking on their logic we can deduce the importance of satisfaction, which is what I claim as the implicit sense of
gratification in the academic settings. It is only the experience of true satisfaction once accomplishing a goal that can foster the occurrence of the virtuous cycle.

Martin's (2006, 2011) studies on personal best goals also illuminated the positive outcomes of self-satisfaction and pride when people complete challenging goals. Martin (2006) gave his understanding about personal best goals as targets made on one's own. However, those targets should first not to be vague, which means one needs to have a concrete plan or procedure about their targeted goals. In addition, those targets were supposed to have appropriate difficulty level that can stretch one's energy and competence. Last, those targets need to embody the next level of effort output, which means to compete against one's last completed goal. Only in this definition of personal best goal, one can smell the satisfaction and pride after it. His claim carried over the important aspects about goal difficulty stressed by goal setting researchers. Similarly stated, the implicit sense of gratification is also built on the completion of proximal goals that need to have escalating goal difficulty and clear objectives. If not met simultaneously, students can hardly gain the feelings of true satisfaction.

The concept of implicit sense of gratification can also be vicariously supported by the control-process perspective of self-regulation (Carver & Scheier, 1982, 1990). Such view on people's behavior states that people tend to keep track of the difference between their current goal status and their desired condition when moving towards it. The "comparator", in Carver and Scheier's model, is where the reference value comes in to make the comparison. In their model, there are several key elements that are congruent with inner meaning of implicit sense of gratification. For example, the reference value serves as comparators. However, the too high reference point will usually induce people's negative affect but few positive in the general sense. On the contrary, the too low reference point can bring much more positive affect and very little
negative ones. This standpoint is similar to the goal difficulty prerequisite in the meaning of implicit sense of gratification in which both too difficult and too easy task won't invoke students' true satisfaction upon completion. Carver and Scheier (1990) also stressed the time pressure as a key determinant to the reference value. Indeed, the time pressure can definitely add its weight to the formula on task difficulty and task completion. With stringent time requirement, an easy task can become stressful, but a difficult or demanding task will not be so intimidating if given enough time to complete. This statement bears the similar vein in the implicit sense of gratification that the goal needs to be finished within reasonable time limits. If a student always begs for time extension without putting their best efforts in it in the first place, the true feeling of satisfaction when successfully finishing it would hardly be construed as a genuine sense. A third point that lends support to the mediator role of implicit sense of gratification to the influence of students' academic intrinsic motivation is how the affect in the self-regulation process can influence people's later actions. Carver and Scheier (1990) stated that the positive affect people experienced can make them look and think their following tasks more positively and the negative affect just did the opposite. It is similarly to be understood that once students successfully complete a short-term goal, the positive feeling of true gratification can make them think more positively about their competence and thus boost their confidence and further their intrinsic motivation towards deeper learning. The negative affect, generated by incompleion of one's short-term goal, can induce students' feeling of doubt about themselves and anxiety as well.

**Summary.** The implicit sense of gratification is a new construct brought to play a meditational role by this study. The above discussion clarifies its role of mediating the relationship between proximal goal setting and students' academic intrinsic motivation. Other than the genuine feelings of satisfaction, the concept is also related to several important concepts
in the goal setting theory. For example, the reasonable difficulty level is about the goal difficulty, the time limits and carefully crafted goals relate with goal commitment and self-regulation. Although the notion of this construct as a mediator is supported by several theoretical perspectives, there is a lack of research explicitly testing this role. For example, the academic emotion researchers usually consider all the emotions altogether that could be experienced by students. The self-concordance model gives us the caution that if people have low control on their goals and thus hurt their intrinsic motivation. The role of satisfaction is a major component in goal setting researchers’ high performance cycle. The studies on personal best goals also stress the importance of self-satisfaction and pride but the difference is that proximal goals do not have to be personal best goals. The control-process perspective of self-regulation touches upon the affect and people's behavior regulation but have not emphasized the proximal and distal goals in college students' lives and their intrinsic motivation level.

**Gender and Grade Level**

Gender issues have always draw people's attention in all walks of lives. Not only the general public has noticed the different behaviors and mindsets males and females demonstrate in a myriad of fields, so did the researchers in motivation studies. In his study of master students' intrinsic motivation issue, Hegarty (2010) found significant differences between male and female students, though it was not his focus in the study. He recommended that gender differences should be considered in future motivation studies. The literature also unveiled varied degree of gender difference.

During the continuous efforts to validate the effect of Academic Motivation Scale (AMS) on undergraduates, Cokley et al. (2001) has confirmed the construct validity of the AMS scale, but also found that there were no statistically significant gender differences in their sample.
In addressing the $2 \times 2$ goal orientation framework, Nien and Duda (2008) conducted a study to test the gender invariance issue under the framework. Unlike other studies who aimed at college students on regular majors, they collected athletes as their participants from universities and other sports club. They found that the gender invariance hypothesis could stand for the most part with only slight difference in one mastery-avoidance scale.

In their meta-analysis on the relationship of goal orientations and academic achievement Linnenbrink-Garcia et al. (2008) also found partial support for the gender difference in goal orientations. The studies included in this meta-analysis showed that performance-approach goal orientations worked better for male students, while the mastery-oriented goals were more beneficial for females.

In their study on performance-approach goals, Midgley et al. (2001) also found marginal evidence that such goal orientation is more beneficial for boys than girls and more for older students than younger ones.

Although researchers have found inconsistent results about the connection between motivational variables and students' achievement, few has using African American solely as their participants (Long, Monoi, Harper, Knoblauch, & Murphy, 2007). In a 2-year cross-sectional study on eighth and ninth graders in an African American dominated school district, Long et al. (2007) examined three motivational variables on the effect of school achievement and found significant gender difference. Girls were showing much stronger inclination in learning goal orientations, while boys indicated more adoption of work-avoidant goal orientations.

To find out whether being boys or girls made a difference in their school achievement, Freudenthaler, Spinath, and Neubauer (2008) conducted a study using Austrian pupils to explore the predictors for school achievement. Even though boys and girls did share some indicators,
they also differed in others. Some predictors belonged exclusively to boys such as academic intrinsic motivation, school anxiety. Other predictors can be found only for girls such as work avoidance.

To examine the role of three types of motivation on college students' academic performance based on self-determination theory, Baker (2004) also found that gender was one significant predictor to make a difference in the overall academic performance. She found that women usually were more motivated after entering a college.

Through the above description in the literature, we can see that the gender invariance is hardly supported by researchers, which warrants the further investigation of gender difference in this study. In addition, the grade level difference has seldom been touched or widely investigated either in the extant literature, let alone the comparison being extended to graduate student level. Therefore, the comparison of undergraduate and graduate students in this study is also a meaningful aspect to look into.
Chapter 3: Method

As stated previously, the purpose of this study are: 1) to explore goal orientation types' impact to students' academic intrinsic motivation; 2) to examine if goal orientation types can influence students' goal setting behaviors; 3) to testify the moderating effect of gender and grade level to goal setting's influence on students' academic intrinsic motivation; and 4) to investigate the mediating effect of implicit sense of gratification to proximal goals.

Guided by these objectives, this study generates the following four main research questions:

1. Are there any significant differences for mastery- and performance-oriented students with regard to their academic intrinsic motivation?
2. Are mastery and performance goal orientations associated with differential proximal goal setting behaviors?
3. To what extent do gender and grade level of students moderate the relationship between proximal goal setting and their academic intrinsic motivation?
4. To what extent does implicit sense of gratification mediate the effects of proximal goal setting on academic intrinsic motivation?

To put the inquiry of proximal goal setting behavior to a more detailed level, this study also designed five closed-ended questions under the third main research question to provide additional information on the behavior, which are unlikely to be captured by quantitative study solely. These five questions are:

1) Is a general, distal goal more suitable for some courses? (e.g., just want to set up an A as final grade for one course without caring about daily progressive efforts; students may just cram for the finals).
2) What factors foster the regular setup of proximal goals?
3) What factors do you think inhibit your proximal goal setting behavior?
4) Under what condition proximal goals can undermine your academic intrinsic motivation?
5) What's the optimal time intervals for proximal goal settings? (e.g., 1-week plan; 2-week plan, etc.)

It's been hypothesized that students distribute their time and efforts based on their own preferences to the courses. Therefore, for some courses they love to attend, they would be more inclined to set up multiple proximal goals. On the contrary, for other courses that they are not quite interested but are mandatory to take, they are more likely to have just one overall distal goal. Students' feedback on the factors to either foster or inhibit the proximal goal setting can provide more insights on this topic. Also, Students who are frequent users of proximal goals may find some situations that the multiple proximal goals can undermine their intrinsic motivation unexpectedly. Lastly, the optimal time intervals for proximal goal settings are subjective for different people, but it is been assumed in this study that two-week plan is the best time intervals for most students.

This chapter will break into four sections to address each of the above-mentioned research questions. The first section describes what kind of participants will be used in this study and how they are recruited. The second section discusses the instruments used in this study and the justifications for each. The third section focuses on data collection procedures. The last section concerns what statistical analyses shall be used to answer the above research questions.

**Participants**

This study focuses on undergraduate and graduate students as a targeted population to explore the research questions delineated above. Prior to the study, an estimation of the overall
participants was made to ensure an appropriate level of statistical power. However, because different statistical analyses were used to answer the four interested research questions, I also applied more than one priori sample size estimation methods to cross-validate the minimum participants requirement should be satisfied.

The first two research questions were proposed to be answered by using one-way ANOVA, so the software G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) was appropriate here to make priori sample size estimation because it can compute statistical power analysis for t tests, F tests, and so on. Since the $2 \times 2$ goal orientation framework was used in this study, there were 4 groups of participants to be analyzed accordingly in one-way ANOVA. With alpha level set as .05 and power as .95, the software returned an estimated 280 participants based on medium effect size $f = 0.25$ (Cohen, 1969, p. 348).

In addition, the proposed conceptual model (see Figure 1) also need sufficient sample size to run the structural equation modeling (SEM) analysis. There were 6 factors (MGO, PGO, PGS, DGS, ISG, AIM) and 36 measured variables in the model. The conventional standard $\epsilon \text{[RMSEA]} = .05$ was used to calculate the sample size requirement for running this structural equation model. Using the R code generator developed by Preacher and Coffman (2006), an estimated 198 participants were the minimum requirement to do the SEM analysis ($\alpha = .05$, $df = 583$, power = .80, null RMSEA = .06, alternative RMSEA = .05). Therefore, having at least 280 participants would also satisfy the SEM analysis requirement.

Before applying the whole instrument to participants, pilot study is needed to ensure its proper use (Kezar, 2000). Connelly (2008) suggested a relative standard of having at least 10% participants from the total size for pilot test. Hill (1998), on the other hand, offered an absolute criteria of obtaining a range of 10 to 30 participants in pilot test stage. This study recruited 59
participants for this pilot study (male 40.68%, female 59.32%, undergraduate students 67.79%, graduate students 32.21%). Judging by the above-mentioned criteria, this sample size was satisfactory based on the previously estimated 280 overall sample size.

The official data collection has finally involved 432 participants (male 19.44%, female 78.70%, other 1.85%), which totally satisfied the priori sample size estimations (280). There were 73.38% undergraduate students and 26.62% graduate students. The majority of ethnicities were Caucasian (57.01%), and the remaining were Hispanic (19.86%), African American (17.99%), Asian (7.94%), and others (2.8%). In terms of age range, the two largest groups were 18-20 years old range (39.25%) and 21-23 range (31.54%).

There is also a caveat mentioned by Vedel (2014) that most studies in education and psychology tend to overly relying on undergraduate students in psychology for the sake of convenience sampling, which would result in only "two" groups in reality for the comparison in their studies—"the psychology students versus others". To avoid such a problem, this study reached out to a diverse group of students coming from various majors other than psychology through the convenience of modern online survey tool. In the pilot study phase, psychology students only occupied as low as 15.25% from the self-reported survey, other leading majors were Human Development 13.56%, Sociology 10.17%, and Education 5.08%. The official study phase also kept psychology students at low proportion of 14.81%, other majors were Human Development 25.93%, Mental Health Counseling 6.48%, Sociology 4.63%, and English 4.63%.

**Instruments**

The whole instrument was composed of five sections. Below are the detailed descriptions for each section and the reasons for using each.
**Goal orientations.** The purpose of this section is to have an initial judgement about participants' different goal orientations in academics. With regard to the measurement of goal orientation, researchers have designed a number of surveys throughout the years. Day, Radosevich, and Chasteen (2003) summarized the commonly used goal orientation surveys based on the dimensions they attempted to measure. For example, there are some two-dimensional surveys focusing on either learning goal orientation or performance goal orientation (e.g., Button et al., 1996; Duda, Chi, Newton, Walling, & Catley, 1995). Corresponding to distinction between the approach and avoidance aspects of performance goal orientation, other researchers have designed three-dimensional surveys (e.g., Midgley et al., 1998; VandeWalle, 1997). Still new surveys emerged with the maturation of the $2 \times 2$ goal orientation framework (Elliot & McGregor, 2001). In view of the evolvement of goal orientation surveys, we can safely infer the rapid development of achievement goal theory.

However, researchers won't halt their steps to make revisions to their survey. By acknowledging several flaws in their 2001 version of goal orientation survey such as mixing goals and motivation underlying the goals, Elliot and Murayama (2008) revised the items in the old survey to grant the new survey more reliability and validity. The modified survey, which was called achievement goal questionnaire-revised (AGQ-R), contained 12 items in total with each goal orientation measure consisting of 3 items. AGQ-R adopted a consistent questioning pattern to make items easier to read and understand. With each goal orientation still containing equal numbers of items, they all start with the same pattern as "My aim is to …; I am striving to …; My goal is to …". By using over two hundred undergraduates to test the psychometric properties of the revised survey, Elliot and Murayama (2008) reported quite satisfactory internal consistency for each goal orientation (Cronbach's $\alpha = .84, .88, .92,$ and .94 respectively).
To investigate the longitudinal change in Korean high school students' classroom motivation brought by classroom engagement, Reeve and Lee (2014) also adopted the AGQ-R as a core measure to assess students' goal orientation. Throughout the whole three-wave longitudinal research design, AGQ-R showed adequate internal consistency across all waves (Cronbach's $\alpha = .76, .77, \text{ and } .76$ respectively).

All the above evidence has granted the adoption of the revised achievement goal questionnaire for this study. This survey will be presented in the first part of the whole instrument.

**Goal setting behaviors.** The purpose of this part of the survey is to acquire participants' goal setting behavior preferences under different goal orientations. Admittedly, there is no shortage of established surveys to assess goal setting. Goal setting itself, however, can be applied to various fields according to goal setting theorists. Early in 1980s, Locke and Latham (1984, pp. 173–175) designed a 53-item questionnaire (reliability index = .74) to assess people's goal setting behaviors for job performance. With more and more application of factor analysis in psychology field afterwards, researchers have extracted ten meaningful factors from Locke and Latham's (1984) questionnaire (Lee, Bobko, Earley, & Locke, 1991). However, this survey is not adopted for the proposed study for several reasons. First, it mainly focused on work settings in which opinions of workers about their boss are solicited. Second, the amount of the goal setting questionnaire was too bulky to be part of the whole instrument in this study. Last but not the least, the survey has not addressed the foci in the present study, which was aiming to know college students' proximal and distal goal setting behaviors.

Therefore, a customized version of goal setting questionnaire was designed by the author to address the need of this study (see Appendix A). Admittedly, some college students may not
have clear personal goals established throughout the semester but just follow their enrolled courses' progress to the end with the mindset that they will pass the course if doing all the assigned tasks. Another portion of students may focus on proximal goals mainly but have a vague distal goal towards one course in their mind. Still others could just have one distal goal for the course such as they are satisfied as long as getting above the minimum level of a letter grade as planned. There are also students who have not only clear proximal goals but also clear distal goal in mind. The above four types of behaviors can be reflected on the goal setting behavior questionnaire. The questionnaire, therefore, has four questions to embody the above four types of goal setting behaviors.

**Proximal goal setting.** The purpose of this part of the instrument is to answer the sub-questions under my third research question about proximal goal setting exclusively. This part of survey is isolated for two main reasons. First, the nature of the questions themselves makes them unlikely to be answered in a Likert-type survey but rather checking on all the available alternatives based on their opinions. Second, these sub-questions can better help readers understand participants' opinions while they work on their proximal goal settings but are difficult to capture in any typical quantitative-designed studies.

There are five questions designed in this part. The first question asks participants whether they think some courses are suitable for having one overall distal goal only. The second question asks them to choose what factors make college students set up their proximal goals regularly. The third asks the reverse of the second question, which indicating the reasons for preventing students from setting up proximal goals. To explore the relationship between proximal goal setting and students' academic intrinsic motivation more critically, the fourth question asks participants to choose from what conditions making proximal goals can harm their intrinsic
motivation. These above four questions can help clarify what factors impact college students' decision on utilizing proximal goals in their studies. The last question focuses on the preferred time intervals in students' mind when making proximal goals. As pointed out by Locke and Latham (2013), the goal setting theory still has limited knowledge on the optimal time intervals for setting up both proximal and distal goals.

**Implicit sense of gratification.** This part of survey is to measure participants' feelings of implicit sense of gratification when they successfully finish a proximal goal within time. The implicit sense of gratification is a genuine feeling of satisfaction, fulfilment, enjoyment when students successfully finish a proximal goal under the designated time limits. As analyzed before, the implicit sense of gratification is not a natural feeling that can occur every time when students finish a proximal goal. There are several key elements in the meaning of a true gratification that have to be present. So, the questions are designed around the key elements. However, since it is a new mediator to explain how proximal goal setting affects students' academic intrinsic motivation, there are no established instruments that can be used directly in the extant literature.

Eight questions in total are designed by the author to measure such this construct. The first question asks college students' general feeling when they successfully finish a self-crafted short-term goal within designated time limits, which is exactly the core of the implicit sense of gratification. The second one asks if students agree that the feeling of relief outweighs the true satisfaction when they barely finish a task assigned by professor by the due dates. The third and fourth questions concern the task difficulty as the key element in the meaning of implicit sense of gratification. The fifth question asks about students' feelings of satisfaction if their goals are not achieved ahead of time. The last three questions ask college students' evaluation of the extent of
true satisfaction if they use longer time to finish a goal or finish in time which in concordance with their own pace. All the above questions embody the definition of implicit sense of gratification in this study.

**Academic intrinsic motivation.** The last part of survey is to have a general measurement of participants' academic intrinsic motivation level. Although the literature has provided a good amount of well-established surveys as discussed earlier in the second chapter of this study, there are unfortunately none of them that could be used directly to accommodate the research purpose in this study. For example, the motivated strategies for learning questionnaire (MSLQ; Pintrich et al., 1993) was a comprehensive survey that contained 81 items in total. Though it also covered the section of intrinsic and extrinsic motivation, its main focus was on the learning strategies. Besides, the amount of items are too bulky to be part of the instrument in this study. Despite its popularity and wide applications of the academic motivation scale (AMS; Vallerand et al., 1992), all the 28 items were targeting on why people go to college to receive higher education in general. In Elliot and Church's (1997) intrinsic motivation survey, though there were only eight succinct items, all the questions were centered on how students think about their personality psychology class such as "I think this class is interesting", "I am enjoying this class very much", "I don't like this class at all". Therefore, their items cannot be used for this research purpose in this study as well.

Acknowledging the scarcity of an instrument to assess students' academic intrinsic motivation, Shia's (1998) proposed an inventory targeting such motivation for college students. In her survey, there were two factors for intrinsic motivation (mastery goals and the need for achievement) and four factors for extrinsic motivation (authority expectations, peer acceptance, power motivations, and fear of failure). The reliability test revealed a good result for this
inventory (Cronbach's $\alpha = .86$). Therefore, considering the match of research purpose, I adapted Shia's inventory by selecting the items that are suitable for this study as well. Since the purpose of this part of survey was to have a general measurement of participants' academic intrinsic motivation level, the items on the factors of authority expectations, peer acceptance, and power motivations were dropped. The final selection contained four items from fear of failure, mastery goals, and need for achievement respectively, which resulted with 12 items in total for this part.

**Data Collection Procedure**

Since this study required human subject as participants to respond to the survey, an institutional review board (IRB) application was filed and approved prior to the start of data collection to ensure the protection of human subject's proper rights.

The data collection was originally designed to be conducted through two main approaches. One is through in-class survey from undergraduate students who have taken courses offered in school of education. The other approach is through online survey tool provided by SurveyMonkey (http://www.surveymonkey.com) which grants convenient access to participants from various different majors. To maintain the consistency issue for the two approaches, all the questions on the two versions were identical. Except for some necessary demographic information that need to be collected to answer some parts of the research questions, the entire survey would not reveal any identity information of the participants.

The actual data collection for both pilot and official study, however, have adopted the online survey approach as the only collecting source due to a consensus on its great convenience. For example, the data input does not have to be transferred from hard copy to digital, secure and fast delivery for data collection from all sorts of majors, easy way to detect missing data, and so on and so forth. With the assistance of several teaching professors, the official data collection has
successfully completed after one and half month's data collection since the beginning of a fall semester.

Data Analysis

**Pilot test results.** Pilot testing is one method to guarantee the proper use of the entire instrument prior to its administration to a larger scale of targeted participants afterwards (Kezar, 2000). The 59 recruited participants (male 40.68%, female 59.32%) represented a similar cohort for the official data because of similar data collecting procedure as planned in both phases. The inclusion of over 30% graduate students in the sample size made the pilot test more confident in answering the inquiries of this study since the author was interested to figure out both grade levels. In addition, the meager proportion of 15.25% for "psychology students" enhanced the academic major diversities for the result of this pilot test. Participants, on average, spent about 4 minutes to finish the whole survey as reported by SurveyMonkey.

The reliability results, Cronbach's α .810, .855, .922, and .936, respectively, for the four types of goal orientations, were very close to what were reported from the authors of this instrument Elliot and Murayama (2008) (Cronbach's α = .84, .88, .92, and .94 correspondingly). The reliability for academic intrinsic motivation part, which was adapted from Shia (1998), in terms of Cronbach's α is .876, also close to the original result reported by Shia (Cronbach's α of .86). The measure of implicit sense of gratification (ISG) an original and essential latent construct in this study, yielded Cronbach's α of .835 for reliability. The reliability test has not been conducted on the part of goal setting behaviors because this part of the survey is to inquire about participants' behavioral preferences in terms of different goal setting practices rather than their opinions on a specific construct. The overall good reliability results have ensured the
confidence to use the whole survey for the official data collection in the next stage (see Appendix A).

**Official data cleaning.** The official data collection has secured 432 participants (male 19.44%, female 78.70%, other 1.85%). Missing data, however, is a prevalent issue for most survey studies that needs to be taken care of prior to any further statistical analysis. Courtesy to the modern data collection approach, the online survey collector not only provided much convenience for data collection process, also lent themselves to handy data cleaning operation.

First of all, the aggregated survey completion percentage report revealed that there were 27 participants who only completed the demographic part; their input had to be deleted because it does not provide useful information in regards to the research questions in this study. Another 21 participants just went a little bit further by addressing the first section of the entire instrument. This portion was listwise deleted as well because such high percentage of missing input would not lead to any meaningful interpretation for this study.

Second, the online survey collector marked both the start time and finish time for each participant, which would give researchers a warning message that if some records were done too quickly. Although the judgment from time difference was subjective, data entries finished in a flash should be treated with more attention. Based on the pilot test results, participants need 4 minutes on average to complete the whole part. If the record shows significantly less time than that for a particular case, it may be dubious to keep that case. After the data deletion from the first step, there were still 11 participants who finished the whole instrument in less than 2 minutes, which was just about half of the average finishing time from the pilot test. However, these 11 respondents were retained in the final sample for this study because of good item-
answering percentage and there were no sign of hastily selecting the same answers on the Liker-type scale all the course till the end.

Through the above two-step cleaning, the total sample size was reduced from 432 to 384 valid cases. A small number of missing values remain in certain survey sections. A key step was to determine if the missing data would pose any potential threats to statistical analysis. According to Schafer and Graham (2002), there were basically three types of missing data pattern—missing completely at random (MCAR), missing at random (MAR), and missing not at random (MNAR). Generally speaking, researchers need to be cautious as to what part of missing data was not at random (MNAR). Due to the nature of the study, there were no assumed systematic reasons that would prevent participants from answering some portions of the survey over the others. Different grade levels, different gender and various majors were not the influencing factors to the missing data. Therefore, it was valid to infer that the missing data pattern in this study was not missing not at random (MNAR). Little's MCAR $\chi^2$ test (Little, Cunningham, Shahar, & Widaman, 2002) also showed a non-significant result for the missing variables ($\chi^2[303] = 341.955, p = .061$), which indicated a missing completely at random (MCAR) pattern. The Expectation-Maximization (EM) algorithm in SPSS 22.0 was then used to compute missing values in the whole data set.

With the updated total sample size in hand, the reliability test was run again to test the official data. Results showed that the four goal orientations were Cronbach's $\alpha$ of .839, .785, .881, .910 respectively. The reliability for academic intrinsic motivation part was Cronbach's $\alpha$ .856. The implicit sense of gratification (ISG) part which is the essential construct in this study has reported Cronbach's $\alpha$ of .719 from the reliability test. The reliability test basically showed consistent results across the board, but there were also noticeable drops for
some parts. For example, the reliability index for mastery-avoidance goal orientation went from original authors' Cronbach $\alpha$ .88 to .855 in this pilot study and further to .785 on the final data. The ISG's reliability also dropped from .835 to .719. However, such drop was not surprising. ISG, as a new survey, was still at its exploratory phase. More importantly, the ISG was established on the premise that participants had the habits of setting goals so that they can feel the intensity of their gratification upon goal completion. However, the sample inevitably involves those who did not possess such habits and thus therefore more likely presented inconsistent responses to all the questions.

**Main approaches to each research question.** This study has generated four main research questions of interest, in which the third one was accompanied with five closed-ended questions to supplement the explanation of proximal goal setting behavior. Therefore, the proper analytical methods were contingent on the inquiry nature of each research question. The specific statistical analysis techniques per research question together with the methodological limitations are discussed below.

Research Question One attempts to explore the differences for mastery- and performance-oriented students with regard to the degree of their academic intrinsic motivation. For this research question, the academic intrinsic motivation was the dependent variable, and goal orientation types were treated as independent variables (see Figure 1). Therefore, a one-way ANOVA followed by an appropriate post-hoc analysis depending on the result of assumption check was performed here for making the between-group comparison. However, it was worth pointing that the group size for each goal orientation was likely to be unequal and it was nearly impossible to reach equal group comparison from this study. In addition, the dependent variable, academic intrinsic motivation, was not guaranteed to follow the assumption of normality as
ANOVA required. So, this assumption along with the homogeneity of variances would be checked prior to the ANOVA method.

Research Question Two is concerned with whether mastery and performance goal orientations differed significantly with regard to participants’ goal setting preferences. Therefore, goal setting behavior was the dependent variable with goal orientation types being its independent variables (see Figure 1). According to the research design, participants’ goal setting behaviors were divided into two broad types—either proximal or distal goal setting based on the design rationale, but it can also be further broken down as four distinctive categories—no goal setting at all; distal goal setting only; proximal goal setting only; having both distal and proximal goal setting. Such characteristics were very similar to the categorization of goal orientation types, who can be considered as either two broad types or four detailed types depending on study purposes. In addition, goal orientation was originally measured on 1-5 Likert-type scale, but its average scores were used to classify people into corresponding goal orientation types, therefore, Research Question Two need to consider goal orientation in two situations: 1) When using its average scores for classification purpose, goal orientation types were categorical variables, a Pearson's chi-squared test was run to answer this research question; 2) When using its original measure, goal orientation types were continuous variables, a binary Logistic Regression was used to address this research question. Given the above two situations, it is worth to examine if the two situations can yield similar results to Research Question Two.

Research Question Three tries to explore if the effect of proximal goal setting on participants' academic intrinsic motivation can be moderated by participants’ gender and grade levels (see Figure 2). A significant interaction between gender and academic intrinsic motivation (see Equation 1) was expected to uncover the moderating effect. Similarly, a significant
interaction was expected to happen on grade level and academic intrinsic motivation (see Equation 2). Such moderating effects will be analyzed in SPSS (version 22.0) by using the PROCESS macro (Hayes, 2013).

There were also five supplemental closed-ended questions regarding proximal goal setting behaviors under this research question. Descriptive statistic technique was used to analyze the major reasons in participants' mind to influence their proximal goal setting behaviors.

However, considerations need to be taken when exploring and interpreting potential moderation effect from gender and grade levels because the whole data were heavily skewed to females (78.91% vs. 19.79%) and undergraduate students (74.22% vs. 25.78%).

\[
\hat{AIM} = \hat{b}_0 + \hat{b}_1 PGS + \hat{b}_2 \text{Gender} + \hat{b}_3 \text{Interaction} + \hat{\varepsilon} \tag{1}
\]

\[
\hat{AIM} = \hat{b}_0 + \hat{b}_1 PGS + \hat{b}_2 \text{Grade} + \hat{b}_3 \text{Interaction} + \hat{\varepsilon} \tag{2}
\]
Research Question Four puts to test the mediating effect of the implicit sense of gratification (ISG) on the relationship between goal setting behaviors and academic intrinsic motivation (see Figure 3). Therefore, another PROCESS macro (Hayes, 2013) in SPSS (version 22.0) was run to analyze the potential mediating effect. Researchers (Baron & Kenny, 1986; James & Brett, 1984; Judd & Kenny, 1981) have gradually formed four steps to establish a complete mediation effect. First step is to show the correlation between the causal variable and the outcome variable. Second step is show the correlation between the causal variable and the mediator. Next is to show that the mediator does affect the outcome variable. Last is to establish the mediator completely mediates the relationship between the causal variable and the outcome variable. But some researchers argued that complete mediation effect may be hard to get because some steps stated above are not easy to be met one by one. When some steps fail, the complete

Figure 2. Gender and grade level as moderators for the relationship between proximal goal setting and students' academic intrinsic motivation.
mediation effect would then become partial mediation (James & Brett, 1984) for failure on step 4 or inconsistent mediation (Kenny, Kashy, & Bolger, 1998) for failure on step 1. Based on the above description and the exploratory nature of the research model and no priori test existed for the concept ISG in this study, the correlations between the mediator ISG, the predictor proximal goal setting, and the dependent variable academic intrinsic motivation were examined first for potential mediation effect.

![Diagram of the research model](image)

**Figure 3.** Implicit sense of gratification as mediator for the relationship between proximal goal setting and students' academic intrinsic motivation.

Besides the four main research questions of interest, this study also attempts to justify the proposed conceptual model (see Figure 1) through the approach of structural equation modeling because the concepts used in the main research questions provide an integration to the three major motivation theories. This attempt was run through EQS version 6.3 (Bentler, 2005) to acquire factor loadings on each latent path. A good data-model fit result would indicate there exists a viable interpretation to the proposed conceptual framework.
Chapter 4: Results

In this chapter, all the analytical results per proposed research questions will be presented in four sections. Section one will reveal the results from both the first and second research question because they are related to goal orientation types. Section two will focus on the third research question investigating the moderation effect of gender and grade level difference on the relationship between proximal goal setting and academic intrinsic motivation. Section three focuses on the mediating effect of implicit sense of gratification between proximal goal setting and academic intrinsic motivation. The results from several closed-ended questions is also discussed on this section. Last section will uncover whether there is a viable interpretation to the proposed structural model.

Goal Orientation on Academic Intrinsic Motivation and Goal Setting Behaviors

The first two research questions all started with participants' goal orientation and tried to explore whether the difference in their goal orientation can make a difference in participants' academic intrinsic motivation and goal setting behaviors respectively. From the final 384 participants' responses on the goal orientation survey section, their highest average score on any goal orientation type was used to categorize their final goal orientation. In total, there were 197 of them categorized as mastery-oriented participants (51.30%) and 141 as performance-oriented participants (36.72%), along with 46 (11.98%) unable to detect because they scored the same for all categories. To further break down the mastery orientation, there were 109 participants with clear mastery-approach orientation and 30 with clear mastery-avoidance orientation but 58 with no clear differentiation. In the performance goal orientation group, 34 of them showed performance-approach goal orientation, 57 showed performance-avoidance goal orientation, but 50 cannot be differentiated within this group (see Table 1). Overall, there were 230 participants
in total having distinctive goal orientation type. It was also interestingly to find out that male and female students possessed similar proportion to the goal orientation types: 43 males (56.58%) and 153 females (50.50%) for MGO; 28 males (36.84%) and 110 females (36.30%) for PGO.

Table 1

Summary of Goal Orientation Distribution

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
<th>Range</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery Goal Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mastery-approach</td>
<td>109</td>
<td>55.33%</td>
<td>1.00 - 5.00</td>
<td>4.37</td>
<td>.75</td>
</tr>
<tr>
<td>Mastery-avoidance</td>
<td>30</td>
<td>15.23%</td>
<td>1.00 - 5.00</td>
<td>3.78</td>
<td>1.09</td>
</tr>
<tr>
<td>Unable to differentiatea</td>
<td>58</td>
<td>29.44%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>subtotal</td>
<td>197</td>
<td>51.30%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance Goal Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance-approach</td>
<td>34</td>
<td>24.11%</td>
<td>1.00 - 5.00</td>
<td>3.91</td>
<td>1.01</td>
</tr>
<tr>
<td>Performance-avoidance</td>
<td>57</td>
<td>40.43%</td>
<td>1.00 - 5.00</td>
<td>3.91</td>
<td>1.13</td>
</tr>
<tr>
<td>Unable to differentiateb</td>
<td>50</td>
<td>35.46%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>subtotal</td>
<td>141</td>
<td>36.72%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undetermined Goal Orientationc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>subtotal</td>
<td>46</td>
<td>11.98%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Goal orientation distribution on the total sample size 384.*

*a*Participants who have same average score on Mastery Goal Orientation. *b*Participants who have same average score on Performance Goal Orientation. *c*Participants who have same average score across the board.

The academic intrinsic motivation survey section contained 12 items on a 1-5 Likert-type scale ($M = 4.85$, $SD = 0.52$). The higher average score on the scale indicated higher level of academic intrinsic motivation. After calculation, most participants (71.61%) obtained 5 points on the 7-point scale (see Table 2).
Table 2

*Summary of Academic Intrinsic Motivation Distribution*

<table>
<thead>
<tr>
<th>Point-scale</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0.26%</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>1.56%</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>18.23%</td>
</tr>
<tr>
<td>5</td>
<td>275</td>
<td>71.61%</td>
</tr>
<tr>
<td>6</td>
<td>32</td>
<td>8.33%</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>384</td>
<td>100%</td>
</tr>
</tbody>
</table>

Research Question One was proposed to be analyzed by using one-way ANOVA with goal orientation type as independent variable and academic intrinsic motivation as dependent variable. Assumptions check was performed first for this dependent variable academic intrinsic motivation. Levene's test indicated equal variances for academic intrinsic motivation, $F(3, 226) = .927, p = .429$. However, the normality test on it failed to suggest a normal distribution from Shapiro-Wilk test ($S-W = .951, df = 384, p < .001$), skewness (-.992, $SE = .125$), and kurtosis (2.571, $SE = .248$). Therefore, the Kruskal-Wallis H test was used instead to explore the potential group difference on academic intrinsic motivation and goal setting behaviors. Since goal orientation is usually studied in four types as specified in the $2 \times 2$ goal orientation framework, this particular research question would follow the convention but also consider the scenario of just two broad types of goal orientation—mastery vs. performance because this research question does not necessitate the use of the four types.

When considering participants with clear categorization into either one of the four goal orientations, there were 230 people in total. The Kruskal-Wallis H test result did not show a statistically significant difference between the academic intrinsic motivation by participants' different goal orientation, $\chi^2(3) = 1.306, p = .728$. 

70
When incorporating those with undetermined orientation either toward mastery (58, 29.44%) or performance (50, 35.46%), the total people expanded to 338 (see Table 1). The Kruskal-Wallis H test result, however, still not present a statistically significant difference between the academic intrinsic motivation based on participants' different goal orientations, $\chi^2(1) = .593, p = .441$.

Research Question Two is concerned with whether the different goal orientation type would significantly influence participants adopting disparate goal setting behaviors. Thus, the goal setting behaviors would be dependent variable in this research question. The goal setting behavior (GSB) survey attempted to inquire participants' general tendency for goal setting behavior preferences. The designed four questions were used to represent four universal preferences (see Appendix A). Participants' highest score on specific question was used to represent their general preference. Highest score on question 1 would indicate an implied distal goal tendency because they were simply following their professors' pace of instruction in the hope of a naturally expected outcome. Highest score on question 2 would suggest participants have some degree of proximal goal setting tendency. Highest score on question 3 showed just an overall distal goal, while highest score on question 4 indicated the preference of setting both proximal and distal goals. According to the design rationale, participants who scored highest in question 2 and 4 on the survey were regarded as proximal goal setting preference (238, 62.50%), and participants with highest score on question 1 and 3 were treated as distal goal setting preference (144, 37.50%).

As stated in previous chapter, goal orientation types were measured on a 1-5 Likert-type scale but its average scores were used to classify participants into different types, so this study considered goal orientation types as both categorical and continuous variables to answer this
research question. Pearson chi-squared test was used when the goal orientation was considered as categorical variables; while binary Logistic Regression was performed when it was considered as continuous variables. Same principle applied here as in Research Question One, goal orientation types were considered in two scenarios as well (4 detailed types or 2 broad types).

When analyzing goal orientation as categorical variables, the Pearson chi-squared test showed non-significant results and very weak effect size on Cramer's V index no matter whether four goal orientation types or just two broad types were used (see Table 3). This result indicated that there was no statistically significant difference between the goal setting behaviors through participants' different goal orientations.

Table 3

<table>
<thead>
<tr>
<th>2 × 2 Goal Orientation</th>
<th>Proximal</th>
<th>Distal</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery-approach</td>
<td>73</td>
<td>36</td>
<td>109</td>
</tr>
<tr>
<td>Mastery-avoidance</td>
<td>22</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>Performance-approach</td>
<td>19</td>
<td>15</td>
<td>34</td>
</tr>
<tr>
<td>Performance-avoidance</td>
<td>31</td>
<td>26</td>
<td>57</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>145</strong></td>
<td><strong>85</strong></td>
<td><strong>230</strong></td>
</tr>
</tbody>
</table>

\( \chi^2(3) = 4.668, p = .198, \text{Cramer's V} = .142. \)

<table>
<thead>
<tr>
<th>2 Major Goal Orientation</th>
<th>Proximal</th>
<th>Distal</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery-oriented</td>
<td>129</td>
<td>68</td>
<td>197</td>
</tr>
<tr>
<td>Performance-oriented</td>
<td>83</td>
<td>58</td>
<td>141</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>212</strong></td>
<td><strong>126</strong></td>
<td><strong>338</strong></td>
</tr>
</tbody>
</table>

\( \chi^2(1) = 1.539, p = .215, \text{Cramer's V} = .067. \)

When treating goal orientation as continuous variables, the binary Logistic Regression (using Enter method) did not show convincing evidence either that goal orientation can make a difference in participants' goal setting preferences. Before the run of Logistic Regression, goodness of fit was examined first by using Hosmer-Lemeshow (HL) test (Lemeshow & Hosmer...
Jr., 1982) for the two situations in this study. When applying the $2 \times 2$ goal orientation framework, HL test returned $\chi^2(8) = 3.549$, $p = .895$, which indicated a good model-data fit. The classification table predicted 62.5% correctness on baseline model and increased to 63.3% correctness when including all the independent variables. This improvement and the overall correction percentage did not predict well participants' goal setting preference given their goal orientation types. When considering the goal orientation as two broad types, HL test returned $\chi^2(7) = 8.146$, $p = .320$, which also suggested an overall good model-data fit. The percentage correctness from the classification table improved from 62.5% to 63.8%. The improvement here was only slightly better. Regression coefficients on these analyses can be found in the tables below.

Table 4

*Regression Coefficients on the $2 \times 2$ Goal Orientation Framework*

<table>
<thead>
<tr>
<th></th>
<th>$B$</th>
<th>$Wald$</th>
<th>$df$</th>
<th>$p$</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>GO1</td>
<td>.38</td>
<td>6.138</td>
<td>1</td>
<td>.013</td>
<td>1.463</td>
<td>[.082, .705]</td>
</tr>
<tr>
<td>GO2</td>
<td>.003</td>
<td>.001</td>
<td>1</td>
<td>.981</td>
<td>1.003</td>
<td>[-.207, .213]</td>
</tr>
<tr>
<td>GO3</td>
<td>-0.187</td>
<td>1.588</td>
<td>1</td>
<td>.208</td>
<td>.829</td>
<td>[-.477, .106]</td>
</tr>
<tr>
<td>GO4</td>
<td>.095</td>
<td>.526</td>
<td>1</td>
<td>.468</td>
<td>1.1</td>
<td>[-.172, .364]</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.793</td>
<td>1.328</td>
<td>1</td>
<td>.249</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* GO1 to GO4 represented Mastery-approach, Mastery-avoidance, Performance-approach, Performance-avoidance respectively.

Table 5

*Regression Coefficients on Two Major Types of Goal Orientation*

<table>
<thead>
<tr>
<th></th>
<th>$B$</th>
<th>$Wald$</th>
<th>$df$</th>
<th>$p$</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGO</td>
<td>.142</td>
<td>3.774</td>
<td>1</td>
<td>.052</td>
<td>1.152</td>
<td>[-.015, .279]</td>
</tr>
<tr>
<td>PGO</td>
<td>-0.031</td>
<td>.293</td>
<td>1</td>
<td>.589</td>
<td>.969</td>
<td>[-.159, .084]</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.396</td>
<td>.403</td>
<td>1</td>
<td>.525</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* MGO represented mastery-oriented goal orientation and PGO represented performance-oriented goal orientation.
Moderating Effects of Gender and Grade Level

Research Question Three is concerned about if the relationship between proximal goal setting and academic intrinsic motivation could be moderated by participants' gender difference and grade level difference. As stated above, participants who selected the second and fourth option on the goal setting behavior survey section would be treated as having proximal goal setting tendency. Therefore, only the 238 participants with proximal goal setting behavior would be analyzed for this research question. Among them, there were 46 males and 192 females, 164 undergraduate students and 74 graduate students. Unequal sample size would possibly pose a threat to the homogeneity of variance assumption and downgrade the statistical analysis power (Rusticus & Lovato, 2014). However, Rusticus and Lovato suggested that collecting as much data as possible is one way to overcome the disadvantage of unequal sample size. Given the total data used in this study far exceeded the minimum requirements for needed statistical analyses, this unequal sample size issue shouldn't be worried too much for this particular study.

Prior to the moderation analysis, the issue of multicollinearity needs to be checked first. By placing the predictor variable proximal goal setting into a linear regression analysis, the collinearity diagnosis returned tolerance of 1.0, which is safe distance to a multicollinearity problem (Bowerman & O’Connell, 1990). Variance inflation factor (VIF) showed the value of 1.0 as well, which will not cause the multicollinearity concern (Menard, 1995).

The PROCESS macro (Hayes, 2013) within SPSS (version 22.0) was used to investigate this moderation effect. Gender difference was checked first, then the grade level difference, last was the combination of gender and grade level difference. To avoid possible issue of inflated
likelihood of error, Bonferroni's correction was used to make an adjustment to the \( p \)-value for the test of significance (Cabin & Mitchell, 2000).

Table 6

**PROCESS Macro Results for Moderation Effect**

<table>
<thead>
<tr>
<th></th>
<th>( b )</th>
<th>( SE ) ( B )</th>
<th>( t )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender ( \times ) PGS</td>
<td>.2209 [.0455, .3964]</td>
<td>0.0891</td>
<td>2.48</td>
<td><strong>.0138</strong></td>
</tr>
<tr>
<td>Male</td>
<td>.1862 [.0294, .3431]</td>
<td>0.0796</td>
<td>2.34</td>
<td><strong>.0202</strong></td>
</tr>
<tr>
<td>Female</td>
<td>-.0347 [-.1134, .0439]</td>
<td>0.0399</td>
<td>-0.87</td>
<td>.3853</td>
</tr>
<tr>
<td>Grade ( \times ) PGS</td>
<td>-.0275 [-.1907, .1357]</td>
<td>0.0828</td>
<td>-0.33</td>
<td>.7400</td>
</tr>
<tr>
<td>Gender ( \times ) Grade ( \times ) PGS</td>
<td>.2559 [-.1247, .6366]</td>
<td>.1932</td>
<td>1.3248</td>
<td>.1866</td>
</tr>
</tbody>
</table>

*Note.* \( R^2 \) for gender is .0259, for grade is .0140, for gender and grade is .0531.

Results (see Table 6) showed that gender difference had a significant interaction with proximal goal setting behaviors (\( b = .2209, 95\% \) CI [.0455, .3964], \( t = 2.48, p = .0138 \)), indicating that the relationship between PGS and AIM was moderated by gender. For males, there was a significant relationship between proximal goal setting and academic intrinsic motivation (\( b = .1862, 95\% \) CI [.0294, .3431], \( t = 2.34, p = .0202 \)). For females, there was a non-significant relationship between proximal goal setting and academic intrinsic motivation (\( b = -.0347, 95\% \) CI [-.1134, .0439], \( t = -0.87, p = .3853 \)). Results from the grade level moderation analysis was not statistically significant (\( b = -.0275, 95\% \) CI [-.1907, .1357], \( t = -.3323, p = .7400 \)), indicating that the relationship between proximal goal setting and academic intrinsic motivation was not moderated by grade levels. Lastly, when considering the possible three-way interaction from ISG, gender, and grade level, the results still failed to find a statistically significant interaction between them (\( b = .2559, 95\% \) CI [-.1247, .6366], \( t = 1.3248, p = .1866 \)). However, it was worth mentioning that this three-way interaction did produce the highest
unstandardized coefficient \( b = .2559 \), suggesting the largest effect on the relationship between proximal goal setting and academic intrinsic motivation.

There were also five closed-ended questions designed for supplementing the interpretation to participants' goal setting behaviors. It was worth mentioning that because the first question can be regarded as one possible factor to inhibit participants' proximal goal setting behavior, it was not designed as an individual question on the survey like others but rather as an alternative for the third one (see Appendix A).

1) Is a general, distal goal more suitable for some courses? (e.g., just want to set up an A as final grade for one course without caring about daily progressive efforts; students may just cram for the finals).

2) What factors foster the regular setup of proximal goals?

3) What factors do you think inhibit your proximal goal setting behavior?

4) Under what condition proximal goals can undermine your academic intrinsic motivation?

5) What's the optimal time intervals for proximal goal settings? (e.g., 1-week plan; 2-week plan, etc.)

The overall frequency analysis (see Table 5) showed that the majority agreed that proximal goals is more congenial to an organized and systematic academic life (74.22%). However, over a half of the participants (57.55%) revealed a free-will study habit that would free them up from any constraints of multiple goals. When being prompted to think about in what conditions having multiple proximal goals can undermine their motivation, participants responded mostly on the frustration and agitation of failure to keeping up with the goal progress (62.76%, 61.20%). Admittedly, having too many proximal goals in hand and not being able to finish on time was a major reason in participants' mind for why they felt discouraged
academically. The last question showed an agreement among a majority of people that one week (42.45%) or two weeks (40.10%) were proper time intervals for setting and accomplishing proximal goals.
Table 7

*Frequency Analysis for Closed-ended Questions*

<table>
<thead>
<tr>
<th>What factors make you set up short-term goals regularly?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I want to make myself more organized and systematic.</td>
<td>74.22%</td>
</tr>
<tr>
<td>I want to keep myself continuously motivated.</td>
<td>57.29%</td>
</tr>
<tr>
<td>I want to keep track of my study progress.</td>
<td>51.30%</td>
</tr>
<tr>
<td>I feel that study in general should have plans just like the “blueprint” is must-have for any buildings.</td>
<td>29.17%</td>
</tr>
<tr>
<td>I have a regular studying habit, which facilitates the setup of short-term goals.</td>
<td>25.52%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What factors do you think will prevent you from making short-term goals?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I want to have some degree of control over my own study efforts. Study less when I’m not in mood, but more when I am willing to.</td>
<td>57.55%</td>
</tr>
<tr>
<td><em>I think it’s fine for some courses to have only one overall goal.</em></td>
<td>30.21%</td>
</tr>
<tr>
<td>Making multiple short-term goals sounds complicated to me and stressful to make.</td>
<td>28.91%</td>
</tr>
<tr>
<td>I don’t like to keep myself busy all the time to finish short-term goals one after another.</td>
<td>21.61%</td>
</tr>
<tr>
<td>I’d rather do more work than just making perfect short-term goals but never strictly follow them.</td>
<td>19.27%</td>
</tr>
<tr>
<td>I don’t know how to make proper short-term goals.</td>
<td>17.19%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Under what conditions do you think having multiple short-term goals can harm your motivation most?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>When I fall behind one or two short-term goals, I would feel agitated and frustrated to hold up my long-term goal.</td>
<td>62.76%</td>
</tr>
<tr>
<td>When I feel fatigued for having to catch up with goals one after another.</td>
<td>61.20%</td>
</tr>
<tr>
<td>When I can’t juggle with goals in other areas.</td>
<td>44.27%</td>
</tr>
<tr>
<td>When I can’t see noticeable improvement after finishing several short-term goals.</td>
<td>40.36%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What’s the optimal time intervals in your mind for making short-term goals?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-week plan;</td>
<td>42.45%</td>
</tr>
<tr>
<td>2-week plan;</td>
<td>40.10%</td>
</tr>
<tr>
<td>1-month plan;</td>
<td>24.74%</td>
</tr>
<tr>
<td>Less than 1-week plan;</td>
<td>15.89%</td>
</tr>
<tr>
<td>2-month plan;</td>
<td>6.51%</td>
</tr>
<tr>
<td>More than 2-month plans;</td>
<td>4.43%</td>
</tr>
</tbody>
</table>

*Note.* The italicized second statement under second question revealed how many participants think a general, distal goal is suitable for some courses.
Mediating Effect of Implicit Sense of Gratification

Research Question Four attempted to see if the implicit sense of gratification can account for the relationship between goal setting behaviors and academic intrinsic motivation. Participants' score on the mediator, implicit sense of gratification, was averaged from the eight items on a scale of 1 to 7 ($M = 5.16, SD = .70$), and the mediator was significantly correlated with the academic intrinsic motivation (Pearson's $r(384) = .24, p < .01$) and also significantly correlated with the goal setting behaviors (Pearson's $r(384) = .15, p < .01$).

The PROCESS macro (Hayes, 2013) was conducted in SPSS (version 22.0) once again for mediation effect this time. The result showed that there was a significant partial mediation effect for goal setting behaviors on academic intrinsic motivation through implicit sense of gratification, $b = .023$, BCa CI [0.0057, 0.0457]. To calculate the effect size for this mediation effect, the MBESS R package (Preacher & Kelley, 2011) was implemented. The R code indicated a relatively small effect size, $\kappa^2 = .043$, 95% BCa CI [.012, .091].

![Figure 4. PROCESS Macro Results for Mediation Effect.](image-url)
It was worth mentioning that the study did not find a significant mediating effect if only considering the group of participants (238) with proximal goal setting preferences concerned, $b = .004$, BCa CI [-.0080, .0220].

**Structural Equation Analysis on the Proposed Model**

This study drew upon several key concepts from three motivation theories—mastery and performance goal orientation from Achievement Goal Theory (AGT, Elliot & McGregor, 2001), proximal and distal goal setting from Goal Setting Theory (GST; Locke & Latham, 1990), and academic intrinsic motivation based on the Self-Determination Theory (SDT; Deci & Ryan, 1985). Therefore, a proposed structural equation model attempted to provide a viable interpretation to integrate these key concepts (see Figure 1). A priori rationale would be different goal orientations in participants' mind would lead to differential goal setting behaviors, therefore could further bring the difference in the varying degree of their academic intrinsic motivation, during which the implicit sense of gratification can help explaining the varying degrees.

Before the structural equation modeling (SEM) technique was run, a correlation matrix between all six latent variables of interest were examined (see Table 8 below).

**Table 8**

*Intercorrelations among Variables in the SEM Model*

<table>
<thead>
<tr>
<th></th>
<th>$M$</th>
<th>$SD$</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MGO</td>
<td>4.08</td>
<td>.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 PGO</td>
<td>3.91</td>
<td>.98</td>
<td>.313**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 PGS</td>
<td>4.15</td>
<td>1.11</td>
<td>.157**</td>
<td>.126*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 DGS</td>
<td>3.86</td>
<td>1.58</td>
<td>-.046</td>
<td>.111*</td>
<td>-.132**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 ISG</td>
<td>5.16</td>
<td>.70</td>
<td>.247**</td>
<td>.220**</td>
<td>.145**</td>
<td>.069</td>
<td></td>
</tr>
<tr>
<td>6 AIM</td>
<td>4.85</td>
<td>.51</td>
<td>.234**</td>
<td>.171**</td>
<td>.019</td>
<td>-.164**</td>
<td>.240**</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01.

From the above intercorrelations we can first see that the two major goal orientations (MGO and PGO) were positively correlated ($r = .313, p < .01$). When checking on them
separately, PGO was positively correlated with all other variables only at different significant levels; similar results were found for MGO with only one exception, namely the relation with distal goal setting ($r = -0.046, p = 0.368$). Proximal goal setting was negatively correlated with distal goal setting ($r = -0.132, p < 0.01$) but positively correlated with academic intrinsic motivation ($r = 0.019, p = 0.709$). Implicit sense of gratification was significantly correlated with almost all other variables except from distal goal setting ($r = 0.069, p = 0.177$). Such preliminary intercorrelation analysis did not yield high correlations between variables of interest or no correlations either, we therefore have confidence to run SEM on them.

After checking the intercorrelations between variables, a standard two-step SEM technique was then performed in EQS 6.3 (Bentler, 2005). In the first measurement stage of model analysis, the total 36 indicator variables were loaded on its corresponding latent factors, and the six latent factors were allowed to covary without any constraints. Based on the model retention criteria, the measurement model produced excellent data-model fit for the full sample ($S-B \chi^2 [413, N = 384] = 686.104, p < 0.001; \text{CFI} = 0.953, \text{SRMR} = 0.054, \text{RMSEA} = 0.042 [0.036, 0.047]$). The second SEM step was to test the structural portion of the model as specified in Figure 1. The model also generated an excellent fit for the full sample ($S-B \chi^2 [417, N = 384] = 687.752, p < 0.001; \text{CFI} = 0.953, \text{SRMR} = 0.054, \text{RMSEA} = 0.041 [0.036, 0.047]$).
Figure 5. SEM Analysis Results. MGO and PGO represent mastery- and performance-oriented goals based on the achievement goal theory. Proximal and distal goal setting are concepts from Goal Setting Theory. ISG represents implicit sense of gratification and is the mediator in this study. AIM stands for academic intrinsic motivation. Factor loadings from measurement phase are not shown here to avoid visual clutter. *p < .05.

As seen from the above SEM model (Figure 5), mastery goal orientation ($\beta = -.046, p < .05$) and performance goal orientation ($\beta = -.169, p < .05$) both produced significant effects on academic intrinsic motivation, though the magnitudes of the factor loadings were at a minimal level and the directions of the effects were both negative. When checking on the four paths from the two types of goal orientations (MGO, PGO) to two types of goal settings (PGS, DGS), we can see that all the factor loadings were significant at .05 level (.293, .185, -.216, .213 respectively). Only the factor loading from MGO to DGS presented a negative direction ($\beta =$
MGO and PGO together explained 18.3% \( (R^2 = .183) \) of the variance on PGS but only 3.8% \( (R^2 = .038) \) of the variance on DGS. When examining the paths among PGS, ISG, and AIM, we can see that all the paths had significant factor loadings (.482, .127, 1.08 respectively), which revealed that ISG provided partial mediation effect from proximal goal setting to academic intrinsic motivation. Proximal goal setting alone explained 23.2% \( (R^2 = .232) \) of the variance on the implicit sense of gratification.

The final clean data with 384 total participants in this study were composed of male (76, 19.79%), female (303, 78.91%), undergraduate students (285, 74.22%), and graduate students (99, 25.78%). As this study was also interested to involve gender and grade level to explore possible differences among the goal settings, another SEM breaking down gender and grade levels was meaningful to serve the purpose of comparisons (male vs. females; undergrads vs. grads). However, the highly-skewed data distribution in this study made such comparisons difficult to run and explain. Fortunately, female students (303, 78.91%) and undergraduate students (285, 74.22%) have both successfully passed the priori 198 estimated minimum participants requirement to run an SEM, which made comparisons for these groups with the total participants possible. But as stated in Chapter 2, this study was more interested to find out how graduate students rather than undergraduate students react to the designed research questions, thus the comparison between undergraduate students and the total participants was not performed. Therefore, only the female students versus total participants was conducted next to seek comparison.

Another standard two-step SEM with female students only (303) was then run in EQS. The measurement phase still yielded good data-model fit \( \chi^2 [413, N = 303] = 667.997, p < .001; \ CFI = .946, \ SRMR = .057, \ RMSEA = .045 [.039, .051] \). The structural phase also
generated an overall good fit for the female only sample (S-B $\chi^2$ [413, N = 303] = 678.153, $p < .001$; CFI = .944, SRMR = .060, RMSEA = .046 [.039, .052]).

Figure 6. SEM Analysis Results with Female Students Only. The abbreviations still represent the same meaning as the former figure. Factor loadings from measurement phase are not shown here to avoid visual clutter. *$p < .05$.

As seen from the SEM results (see Figure 6), implicit sense of gratification still partially mediated the relationship between proximal goal setting and academic intrinsic motivation. However, the factor loadings on other paths produced noticeable differences comparing to the results from total participants. First, the factor loadings on mastery-oriented (-20.905, $p < .05$) and performance-oriented (24.239, $p < .05$) were greater to academic intrinsic motivation but with opposite directions this time. Second, the factor loadings pointing to proximal goal setting were clearly much larger from mastery goal orientation (137.308, $p < .05$) and performance goal orientation (-136.368, $p < .05$), but the direction for the latter path was negative. Third, the factor
loadings between mastery goal orientation and performance goal orientation reduced from .263 to .104.

To sum, the SEM results from the total 384 participants (see Figure 5) returned overall good data-model fit to support the conceptual framework proposed in this study. The PGO significantly related with both PGS (.185, \( p < .05 \)) and DGS (.213, \( p < .05 \)); MGO showed similar results but presented a negative direction to DGS (-.216, \( p < .05 \)). Both types of goal settings showed significant relationship to AIM but the proximal type clearly displayed much higher loading (1.08, \( p < .05 \)) than the distal one (.243, \( p < .05 \)). These results corresponded with the priori rationale for the model that students with different goal orientation can bring differences in terms of goal setting behaviors, and therefore could further result in varying degree of their academic intrinsic motivation. The significant paths from PGS to AIM via ISG indicated ISG’s mediating effect, which was also consistent with the priori rationale. The SEM results from females only (see Figure 6) also generated good data-model fit but with several noticeable differences on some paths. Comparing to the total participants model, female students not only showed higher loadings from their goal orientations to AIM, but also much higher loadings from goal orientations to the proximal goal setting. The implications for such differences will be discussed in the next chapter.
Chapter 5: Discussion

This study proposed a conceptual framework to integrate major concepts from three motivation theories—achievement goal theory, goal setting theory, and self-determination theory. The generated four main research questions (see below) were designed to explore the relationship among these key concepts. Besides, a structural equation modeling analysis was conducted to investigate a viable interpretation to the concepts integration.

1) Are there any significant differences for mastery- and performance-oriented students with regard to their academic intrinsic motivation?

2) Are mastery and performance goal orientations associated with differential proximal goal setting behaviors?

3) To what extent do gender and grade level of students moderate the relationship between proximal goal setting and their academic intrinsic motivation?

4) To what extent does implicit sense of gratification mediate the effects of proximal goal setting on academic intrinsic motivation?

To address the above research questions, group comparison techniques were applied to answer the first two questions, moderation and mediation analysis approaches were implemented to answer the last two. Findings of each analysis will be discussed in the following sections. The implications of doing this study, potential limitations and future working directions are also addressed sequentially in this chapter.

Findings and Implications of the Study

Goal Orientation Types. Since the goal orientation framework came out (Elliot & McGregor, 2001), students with mastery goal orientation have been hailed by many as a preferred learning orientation towards their academic career because of the emphasis was
always on the content mastery. Performance-oriented students, on the other hand, invested in their learning by having good track record in their academics as the sole motive. Thus, these students would less likely develop a steady and progressive learning habits throughout an entire academic year. Evidence for having mastery goal orientation has been collected by many researchers to confirm its benefits (e.g., McGregor & Elliot, 2002; Wolters, 2004). The intrinsic motivation—as an essential construct from self-determination theory (SDT; Deci & Ryan, 1985)—was the degree of people's desire to do thing out of their own will. Therefore in this study, students with mastery goal orientation were assumed to correspond to higher level of academic intrinsic motivation comparing to those performance-oriented students.

However, the statistical analyses results said otherwise. There was no statistically significant difference for either mastery or performance goal orientations in terms of their degree of academic intrinsic motivation. This finding provided an evidence to the literature that goal orientation types did not differ themselves significantly to the degree of academic intrinsic motivation. The performance goal-oriented students, contrary to the assumption in this study, didn't possess significantly less amount of academic intrinsic motivation comparing to mastery goal orientation. The finding also did not support Rawsthorne and Elliot's (1999) conclusion that performance goal orientation did harm students' intrinsic motivation under some conditions.

Goals drive people forward, as in goal setting researchers' mind. People who establish regular goals usually perform better in their works. Similar research findings also come from education professionals. Morisano et al.'s (2010) study clearly stated the benefits of goal setting for students in a four-year university. Therefore, the second research question hypothesized that mastery-oriented students would present more frequent goal setting behaviors to keep up with their study progress and record their efforts.
The analysis results, however, refused such hypothesis. There was no statistically significant difference for either mastery or performance goal orientations in terms of their goal setting behaviors. The result was surprising that mastery-oriented students did not outperform performance-oriented ones in this regard. Mastery-oriented students, who concentrated on their true mastery of the knowledge, were assumed to be more effective if setting up multiple short term goals alongside. Performance-oriented students, on the other hand, would demonstrate more cram study habits thus leaving goals-setting out of their consideration. The finding on this research question inferred that goal setting behaviors were not exclusive to any types of goal-oriented students. Performance-oriented students would also possess the habit of setting up short term goals to make their study more purposeful.

To sum, the first two research questions found that goal orientation types were neither a deciding aspect for the degree of students' academic intrinsic motivation nor a determining factor for graduate and undergraduate students' goal setting behaviors. Either type of the major two goal orientations can obtain the high degree of academic intrinsic motivation for more energized study and can also establish their preferred goal setting habits and follow along. This research evidence supported Barron and Harackiewicz's (2001) conclusion that it was time to consider the benefits of the two major goal orientation simultaneously, in which each major type can facilitate students' study.

**Proximal Goal Settings.** Given the stated benefits of setting multiple goals, this study attempted to inquire the relationship between proximal goal setting and academic intrinsic motivation and further explore if gender and grade levels could moderate such relationship. Since Hegarty (2010) found significant differences between male and female master students' academic intrinsic motivation, he recommended that all future motivation studies should involve
the part of gender difference analysis. Baker (2004) also revealed earlier that women were usually more motivated after entering a college. This study did confirm that gender difference can moderate the relationship between proximal goal setting and academic intrinsic motivation.

Grade level difference between undergraduate and graduate students has seldom been studied in the literature. Not many studies included graduate students in their participants, let alone a good amount of doctoral students. Graduate students, who has already come to the critical stage of determining their future working directions, are supposed to be more intrinsically-driven to their desired outcome and thus would be more likely to establish multiple goals to materialize each milestone. But Hegarty's (2010) research revealed that master students were also low in academic intrinsic motivation which justified the inclusion of graduate students in this study accordingly. The analysis results, however, showed that grade levels did not moderate the relationship between proximal goal setting and academic intrinsic motivation. This unexpected finding raised more concern for graduate students' study habits. Graduate students, are not regulating themselves well as expected that establishing multiple goals in their daily academic lives to pursue desired learning outcome.

The third research question also accompanied with several closed-ended questions to uncover more information about college students' opinions on short term goals. However, researchers need to pay attention when making generalization. The interpretations for these closed-ended questions were used to supplement the query for the third research question in this study only.

The first closed-ended question asked if students think a general distal goal would be suitable for some courses. There were 30% of participants agreed on this question which indicated that for some courses, a good amount of students do not see the necessity of making
short term goals. The second question asked what factors foster the regular setup of proximal
goals and majority of them (74.22%) chose the factor to make their lives more organized and
systematic. This indicated that participants were aware of this clear benefit of setting short term
goals. More than half of the participants agreed on that proximal goals can make them
continuously motivated (57.29%) and can help record their study progress (51.30%). The third
question required participants think from the reverse side that what factors prevent them from
making proximal goals. Over half of the participants (57.55%) chose the free learning style that
they study more when in mood but less when not. This will set an interesting dilemma that
college students admit the benefits of setting proximal goals but in the mean time are reluctant to
put forth efforts and let mood get the better of them. The fourth question requested participants
to select conditions that setting proximal goals can undermine their academic intrinsic
motivation. Participants put the top conditions as being frustrated if falling behind predetermined
goal completion progress (62.76%) and being fatigued for finishing proximal goals one after
another (61.20%). Participants' response made sense for the consideration of holding proximal
goals back. Goals should only serve as facilitators, boosters, and motivators to one's life, rather
than become constraints to derail one's original intrinsic motivation. The fifth closed-ended
question tried to inquire optimal time intervals for proximal goal settings. The majority of them
selected one-week (42.45%) or two-week plan (40.10%) as optimal time intervals. This answer
pattern fit the priori expectation that such time intervals are appropriate for making and finishing
an intensive short term plan. Time intervals less than one week would be too intense for college
students' life. In fact, only 15.89% of participants chose that. When the time intervals span one
month long, about a quarter of the participants (24.74%) thought it was acceptable to be a
proximal plan. Given the practical consideration about a typical three-and-half months’ semester
length, the author thought that one-month short term plan may better suit for any larger projects rather than course works. This question provided some evidence for the rarely answered aspect in most goal setting studies (Locke & Latham, 2013).

Implicit Sense of Gratification. The implicit sense of gratification (ISG) is a new construct that proposed in this study. It has been defined as a genuine psychological feeling of satisfaction and fulfilment when students successfully finish a reasonably-made task within time limits that serves as an incentive for future goal-achieving commitment but not necessarily need to be expressed explicitly outwards.

Though the ISG has found several theoretical relevance as stated in Chapter 2, this new construct did have clear differentiation with other well-established concepts. For example, in his explanation about affective reactions, Bandura (1986) stated that the percentage of one's goal completion can lead to people's positive or negative feelings and further influence their level of self-efficacy. When people had perceived high percentage of goal progress, they exerted more positive feelings such as encouragement. People would have discouragement or other negative feelings if their goal has been completed at low percentage or even failed to operate. People would then downgrade their level of self-efficacy and were hesitant to implement future goals because of possible doubt on their abilities. ISG's genuine feeling of satisfaction and fulfilment (used in this study) was consistent with Bandura's affective reaction on goal setting, but the differences can be found in these regards: 1) ISG stated that such feeling of satisfaction and fulfilment did not need to be publicly-known (i.e., implicit) to others; such feeling served as a psychological motivator for oneself; 2) ISG contained more task-related properties such as task difficulty and time limits as integral parts of its meaning; 3) ISG did not extend to students'
subsequent belief about their ability (i.e., self-efficacy) after either a positive or negative feeling but only focused on the positive psychological feeling upon goal completion.

Since ISG stressed a lot on the implicit feeling of satisfaction and fulfilment upon goal completion, it had much concordance with the concept of sense of flow (Csíkszentmihályi, 1990) but also differed in many aspects. Sense of flow embodied one's total immerse with a task and thus sensed an "optimal experience" given the task that stretched one's ability to their limits. Though we did hope students can experience their sense of flow constantly while doing their studies, the ISG differed with it in the following three ways: 1) the self- or others-initiated goals in ISG did not have to be the ones that always stretching students' abilities to their limits. In fact, students (62.76%) reported that they would feel agitated and frustrated if the goals were impossible to complete and they were therefore falling behind their schedule. The proximal goals in ISG need to be adaptive to students' courses and competency level. 2) the "optimal experience" may not be sensed by every student but the feeling of satisfaction and fulfilment can. Students can have their own pace to set up and complete a goal and therefore have their unique progressive path to academic success. 3) ISG did not build on full immersion with a task but about a goal completion within reasonable time frame. If a student can finish a task far ahead of time, the feeling of satisfaction can be gained and thus the student can move on to new tasks. The high efficiency here wasn't necessarily related to total immersion on the task.

Given the above elaboration, it is important to point out that ISG is a newly-proposed construct that bears noticeable differences with other well-established constructs. Such elaboration helps justify the need for the creation of survey items for ISG measured in this study instead of adopting any existant surveys without doubt. Therefore, this study hypothesized that
the ISG can help account for the relationship between goal setting and academic intrinsic motivation, i.e., the ISG is a mediator to the relationship.

The analysis result showed that the implicit sense of gratification significantly mediated the relationship between goal setting behaviors and academic intrinsic motivation. When students successfully complete their reasonably-made plans, it is the psychological feeling of satisfaction and fulfilment that help boosts their academic intrinsic motivation. The key parts of this concept make the significant mediation effect plausible. First, such feeling of satisfaction should be a genuine one that comes from effective task completion rather than a feeling of relief after a tedious and laborious work. This genuine feeling would correspond to the essence of intrinsic motivation which is also a genuine reflection of one's real interest that cannot be faked. Second, one way people maintain their intrinsic motivation is to keep them continuously engaged. If the goal or task is excessively lower or higher than one's current ability level, intrinsic motivation could be hard to preserve, which also not fit the definition of intrinsic motivation (Ryan & Deci, 2000a). This is exactly the second key part for implicit sense of gratification that tasks should contain reasonable difficulty level. Third, the genuine feeling of satisfaction should involve finishing a task in a timely manner, i.e., within the proper due dates. Any procrastination behaviors would undermine such genuine satisfaction feeling and further their intrinsic motivation. Just like most participants (62.76%) reported that when they fall behind one or two short term goals, they would feel agitated and frustrated to hold up their long term goal. Fourth, implicit sense of gratification is an implicit feeling that not necessarily be public to others. This inner feeling bears resemblance to the concept of intrinsic motivation that both are kept within oneself. Because of the above crucial aspects, the implicit sense of
gratification serves as a credible mediator to account for the relationship between goal setting and academic intrinsic motivation.

**Implications.** As stated in Chapter 1, this study has four purposes: 1) to explore goal orientation types' impact to students' academic intrinsic motivation; 2) to examine if goal orientation types can influence students' goal setting behaviors; 3) to testify the moderating effect of gender and grade level to goal setting's influence on students' academic intrinsic motivation; and 4) to investigate the mediating effect of implicit sense of gratification to proximal goals. Thus, the research findings from this study will carry both educational and theoretical implications.

Educationally, this study sheds light on both undergraduate and graduate students' goal orientation types and their preferences for goal settings in the course of their study. The inclusion of both master and doctoral students in this study provides one more example for getting graduate students involved in motivation studies (Hegarty, 2010). However, the research findings revealed that there was no significantly difference for goal orientation types in terms of students' academic intrinsic motivation and goal setting behaviors.

This finding carries an educational implication that professors and instructors better not overly emphasize the goal orientation difference because such factor alone did not predict any differences in this study with regard to students' level of academic intrinsic motivation and did not foster them establish the regular goal setting habits either. Students may, and have the freedom to adopt any goal orientation type towards different courses on their schedule due to various reasons. Their worries should be eliminated from their professors that they can and will succeed no matter which goal orientation type they are using. Professors, on the other hand, better not view goal orientation type as primary or even solely predictive of students' final study
outcome. In addition, professors need to encourage students with either goal orientation type setting up goals regularly to make their larger academic success achievable.

This educational implication is also consistent with the literature that more and more researchers and educators endorse a multiple goal perspective that downplays the distinction of goal orientation types (e.g., Barron & Harackiewicz, 2001; Liu et al., 2009). Some other researchers also revealed that students usually won't stick to one goal orientation all the time but rather frequently switch types to accommodate different course demands (Lieberman & Remedios, 2007), which brings another support to this educational implication. However, it is suggested that educators still need to encourage students adopt mastery-dominant learning attitudes in their whole academic career. This does not only echo researchers' findings that mastery goals relate to more positive emotions (Huang, 2011) and predict better achievement-related processes (McGregor & Elliot, 2002), but also help them build up the philosophy that only true mastery in the knowledge and skills can help them overcome difficulties in study and in work.

Findings from Research Question Three revealed that gender can moderate the relationship between goal setting and academic intrinsic motivation but grade levels cannot. Specifically, females students were more prone to goal setting behaviors than males, but no difference for undergraduate versus graduate students in this regard. When using female students only to run the SEM analysis, there was also a clear difference on the path from mastery goal orientation to proximal goal setting: The model (see Figure 6) with females only showed much higher factor loading (137.308, \( p < .05 \)) comparing to the model (see Figure 5) with all participants (.293, \( p < .05 \)).
The findings, on one hand, provide support to Baker's (2004) observation that female students were more motivated once in college. Higher motivation level can result to a virtuous circle for more frequent goal setting behaviors and thus boost their academic intrinsic motivation. The findings, on the other hand, confirmed Hegarty's (2010) investigation that graduate students also suffer from noticeable decrease of intrinsic motivation.

These findings bring another educational implication that male students and graduate students need equal guidance to set up goals for more effective learning and thus elevate their academic intrinsic motivation. This can be done in the following ways. First, professors, when teaching both undergraduate and graduate students in a semester, need to provide explicit instructional support and structure to graduate students as well because even though they are mature than undergraduate students, they are still anxious to master knowledge as much as possible from school. So, explicit instructions are also essential and beneficial to their studies. Second, male students, especially in some majors, tend to be overlooked because of relative "minority" status in the class. This situation may lead to some male students reluctant to talk and join group work in a female-dominated class. So, professors need to have equal attention to both genders and offer more assistance for males as discovered from this study. Third, professors are advised to make their syllabus stable across the whole semester and follow the pre-arranged syllabus more closely and tightly. This will provide convenience for students to make their short-term goals accordingly. Frequent disruptions to their goals can make them feel agitated (62.76%) and even make them abandon such goal setting behaviors if they feel that they can't catch up with their goals habitually (61.20%) as they reported in the closed-ended questions. Lastly, if possible, professors are suggested to revise their syllabus to make it more suitable for short-term goals by providing weekly learning objectives and such. Professors can also adopt goal setting
and completion track system. By doing so, professors proactively encourage students build up self-regulation skills and set up short-term goals, but more important is to provide timely, honest, and explicit performance feedback to students.

Theoretically speaking, this study also bears three major implications.

First, the overall good model-data fit from two SEM results established the previously conceptualized structural model for integrating concepts from three major motivation theories. Goal orientation, overall, did not significantly differentiate themselves in terms of goal setting behaviors. SEM results from total participants reported similar magnitudes of factor loadings except one negative direction. SEM results from female only participants, however, revealed that mastery-oriented students were much more likely to establish proximal goals while performance-oriented students were just the opposite. In addition, goal orientation did not have great impact to one's academic intrinsic motivation given the significant but minimal and negative factor loadings from total participants. However, female-only SEM analysis revealed higher loadings and opposite directions. The positive direction from performance goal orientation to academic intrinsic motivation may indicate that these students regard high performance on tests and/or classes as primary ways to boost their motivation level. The negative direction from mastery goal orientation to academic intrinsic motivation may suggest that motivation level may be lowered down when the true mastery of knowledge can't be gained properly. Such opposite directions are also consistent with Senko and Miles's (2008) explanations about one disadvantage of having mastery goal orientation to lowered motivation and performance because of unbalanced efforts on different courses.

Second, academic intrinsic motivation was analyzed as a role of dependent variable rather than independent variable acting as predictors for other latent variables (e.g., Dinger et al.,
2013; Turner et al., 2009). This role change brings more attention to the concept of academic intrinsic motivation itself. What factors can contribute or undermine the level of it deserve large amount of studies on it.

Last but not the least, the SEM model consolidated that the proposed concept, implicit sense of gratification, did partially mediate the relationship between proximal goal setting and academic intrinsic motivation. This contributes to the literature a new factor to consider when explaining proximal goal setting and academic intrinsic motivation.

**Limitations and Future Directions**

Even though this study produced certain promising results, the study itself has several limitations as well.

First is about the use of self-reported surveys. Survey itself is an ordinary tool to collect participants' opinions, but it clearly has its own limitations such as response biases (Brutus, Aguinis, & Wassmer, 2013), common method biases (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), self-presentation concerns (Dinger et al., 2013). People nowadays are exposed to numerous surveys in all sorts of lengths and formats, thus they would usually not regard one survey too seriously over the others to genuinely reflect their opinions. It is easy to forecast small portion of your participants finishing a survey in a hasty way without much attention to the survey statements and thus leaving you a lot of invalid data or valid data with lots of missing values. Even the surveys with small amount of monetary rewards do not work as well as it expected, let alone the surveys contain too many questions or the questions are difficult to answer or are sensitive to some people. These situations all lead to the unreliable aspects of a self-reported survey. Fortunately, all the survey reliabilities indicated good confidence to overcome those issues. However, keep working on the newly-designed surveys is a must for
future research. Besides, the future working direction can include interview as a key supplement to know more about participants' goal setting preferences other than the designed closed-ended questions which were also self-reported. For example, more questions can be asked about why some students think it is fine for some courses to have only a distal goal.

Second is a collection of methodological limitations specific to this study. Starting with students’ goal orientation types have already put this research into high stake of facing potential or even extreme unbalanced groups situations, which would compromise the following gender and grade level comparison analyses. From the distribution of the final data (384), females (79%) and undergraduate students (74%) have occupied overly high percentages. Although the small amount of graduate students compared to undergraduate students did not cause any problem for analyses in this study due to sufficient overall sample size, having unbalanced groups was still not an ideal situation for statistical analysis. Admittedly, graduate students are sparsely included in many studies due to various practical reasons such as the overall amount is relatively small in a college or university and they are hard to be accessed altogether in a large classroom like undergraduate students. Despite this, many research findings call for the inclusion of them in future studies because the findings may surprise a lot (e.g., Hegarty, 2010). So the future working direction would try more ways to enlarge the sample size of graduate students, so do for male students. Another major methodological limitation is about non-normality for the dependent variable academic intrinsic motivation. The violation of normality assumption for one-way ANOVA makes Research Question One switch to a non-parametric test—Kruskal Wallis H Test. However, given the fact that higher value in academic intrinsic motivation indicates better situations for students, it is good to expect the values are strongly skewed to the high value tail. Next major methodological limitation is the combined use of multiple individual
analyses and then SEM analyses. Admittedly, the interested research questions are much more handy to be solved by individual statistical approaches, but this could bring potential statistical concerns such as inflated measurement errors. SEM techniques, despite its statistical advantages, are not easily to tackle group difference compared to ANOVA method. In addition, moderation effects, as indicated in this study, have more technical barriers to materialize in SEM, especially with more than one categorical variables (gender and grade level) as moderators.

Third limitation is about generalizability issue for the study results. Academic intrinsic motivation and goal setting behaviors definitely do not just confine to college level students, middle and high school students are also in their critical stage to shape their future majors. The research findings from this study should not be easily carried over to these students without caution. For example, this study provided support to Baker's (2004) observation that female students are more motivated once in college, but the conclusion cannot be drawn about female students in secondary education levels. In addition, this study did not consider the cultural influence despite multiple countries and regions for the total participants. More and more researchers start to notice the potential difference brought by students' cultural background (e.g., Chirkov, Ryan, & Kim, 2003; Fishbach, Henderson, & Koo, 2011; Jang et al., 2009). In United States, the dominant individualism ideology may impact people's thinking on many things. King (2016) demonstrated that collectivism in oriental world can moderate the effects of performance-avoidance goal orientation on learning strategies and intrinsic motivation.

Last but not the least limitation is about the survey of implicit sense of gratification. This new survey was designed for the first time to be applied in this study, it has the following clear limitations. The first limitation about ISG is that it is not a unidimensional concept like other well-established ones given the several constraints placed on goal settings (e.g., task difficulty,
reasonable time limits, etc.). Other researchers may find it difficult to generate one major factor loading if running exploratory factor analysis (EFA). Because of that, it is more difficult to interpret the mediating result from ISG. Second, ISG can only measure participants' retrospective feelings on goal setting and completion. But it can be justified in two ways: 1) it is almost impractical to measure large participants' on-site feelings after a proximal goal completion; 2) ISG does not measure only one proximal goal but rather an overall feeling of working on consecutive proximal goals. Third, ISG’s reliability can be noticeably dropped if the majority of recruited participants did not possess proximal goal setting habits. Such participants would then be less likely to respond honestly to the survey items.

Though the ISG survey received good reliability index from the pilot study, the survey itself clearly needs more work to achieve better internal consistency given the above-discussed limitations. First, all survey items need to be more clear to participants so that different participants don't have different understandings about these items, in other words, items should prevent any ambiguities to participants. The Achievement Goal Questionnaire-Revised (AGQ-R; Elliot & Murayama, 2008) set a good example in this regard. By rephrasing all three items for each goal orientation with the same inquiry pattern ("My aim is to …; I am striving to …; My goal is to …), the survey created an easy-to-read mode for all participants. Second, the whole survey needs to seek if any concise version can also do the job. The current version contained eight statements to embody the full meaning of ISG, but it didn't rule out other versions with fewer statements that can do the same job. Third, more validation studies using different targeted population are necessary to confirm this concept.
Conclusion

Though the achievement goal theory (AGT; Ames, 1992; Dweck & Leggett, 1988) has clarified the $2 \times 2$ goal orientation framework, the analysis results in this study do not differentiate the types with regard to academic intrinsic motivation for both undergraduate and graduate students as well as their goal setting behavioral differences. Such findings do not mean to devalue the goal orientation framework, but carries more educational implication that professors should avoid stress the difference of the goal orientation types in order to boost students' academic intrinsic motivation and facilitate the regular goal setting habits for their study progress.

Gender and grade level difference are used in this study to explore their potential moderation effect on the relationship between proximal goal setting and academic intrinsic motivation. However, the moderation effect only existed for gender difference. Grade level comparison between undergraduate and graduate students did not find any significant moderation effect. Such unexpected result raised more concern about graduate students' study situation. So, this study will continue Baker's (2004) suggestion that all future studies in education should get graduate students involved.

The concept of implicit sense of gratification is regarded as a mediator to account for goal setting and academic intrinsic motivation. The significant mediation effect provides explanations as to why goal setting can bring the boost of academic intrinsic motivation. Though this new concept clearly needs more work, it provides a new way to look at and explain students' academic intrinsic motivation, which serves as the inner drive to their academic success.

The proposed structural equation model in this study successfully brings a viable integration of three different motivation theories. The model has not only justified the openness
dimension of the goal setting theory (Locke & Latham, 2006), also confirmed the priori hypothesis that different goal orientations would lead to differential goal setting behaviors, therefore could further cause the difference in the varying degree of their academic intrinsic motivation, in which the implicit sense of gratification can help explaining the varying degrees.

However, cautions need to be taken when using samples from different regions and cultural background due to earlier-mentioned limitations. The survey of implicit sense of gratification needs more attention when used in large samples.

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Appendix A

Implicit Sense of Gratification: A New Lens on Academic Intrinsic Motivation

Part I: Consent Form

Dear participants,

This survey is used in my doctoral dissertation to know your opinions about the influence of your goal orientation and goal setting in your study on your academic intrinsic motivation. In this survey, you will be first asked to provide basic demographic information, followed with your goal orientation towards study, then your goal setting behaviors while in study and how you felt when finishing a goal, and last a measure of your level of academic intrinsic motivation.

You are eligible for this study as long as you are in a college level institute, regardless of undergrads or graduate students. Your participation is on a voluntary basis and all your opinions are kept anonymously and for this dissertation study only. You have the right to reserve your opinions if you find any questions make you uncomfortable. Your rights have also been protected by the protocol of Institutional Review Board (IRB). The whole will take you about 10 minutes to complete. If you have any questions about this study and concerns about your rights as a human subject, feel free to reach the principal investigator for this study using information down below.

I thereby confirm that I have read the description of this study and are willing to participate on my own will. I understand my rights as a human subject participant and am fully aware that I have the full control for my voluntary participation.

☐ YES  ☐ NO

Thanks for your time and much appreciated for your participation!

Haiyang Su
hsu@albany.edu
Department of Educational and Counseling Psychology
School of Education
University at Albany, SUNY
Part II: Demographic Information

Please specify the following questions:

Q1: What is your gender?

☐ Male ☐ Female

Q2: What is your current grade level?

☐ Freshmen ☐ Sophomore ☐ Junior ☐ Senior ☐ Master ☐ Doctoral

Q3: What is your ethnicity?

☐ White or Caucasian
☐ Hispanic or Latino
☐ Black or African American
☐ American Indian
☐ Asian
☐ Native Hawaiian and Other Pacific Islander
☐ Other

Q4: What is your age?

☐ less than 18 years old
☐ 18-20 years old
☐ 21-23 years old
☐ 24-26 years old
☐ 27-29 years old
☐ 30-32 years old
☐ 33-35 years old
☐ 36-40 years old
☐ 41-45 years old
☐ 46-50 years old
☐ older than 50

Q5: What is your major? ___________________________.
Part III:

Section 1: Goal orientation.

Directions: Please read each following statement carefully and choose the number that best describes your opinion. (Strongly Disagree (SD) = 1, Strongly Agree (SA) = 5)

<table>
<thead>
<tr>
<th>Statement</th>
<th>SD</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>My aim is to completely master the material presented in this class.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I am striving to understand the content of this course as thoroughly as possible.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My goal is to learn as much as possible.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My aim is to avoid learning less than I possibly could.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I am striving to avoid an incomplete understanding of the course material.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My goal is to avoid learning less than it is possible to learn.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My aim is to perform well relative to other students.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I am striving to do well compared to other students.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My goal is to perform better than the other students.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My aim is to avoid doing worse than other students.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I am striving to avoid performing worse than others.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My goal is to avoid performing poorly compared to others.</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Section 2: Goal setting behaviors.

Directions: Please read each following statement carefully and choose the number that best describes your opinion. (Absolutely not describe me = 1, Absolutely describe me = 7)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Abs_Not_Me</th>
<th>Abs_Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>I usually don't make any short-term and long-term goals, I just follow my professor's assignments and progress.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I usually set up several short-term goals, but don't have a clear overall goal for my study.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I usually don't make any short-term goals, I just have a general long-term goal for my courses such as getting an A in the end.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I have clear short-term and long-term goals, and I adjust my learning speed with my professors'.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
Section 3: Proximal goal setting.

Directions: Please read each following question carefully and pick the ones that best describe your opinion.

Q1: What factors make you set up short-term goals regularly?
☐ I want to keep track of my study progress.
☐ I want to keep myself continuously motivated.
☐ I want to make myself more organized and systematic.
☐ I feel that study in general should have plans just like the “blueprint” is must-have for any buildings.
☐ I have a regular studying habit, which facilitates the setup of short-term goals.
☐ Others, please specify ________________________________.

Q2: What factors do you think will prevent you from making short-term goals?
☐ I don’t know how to make proper short-term goals.
☐ I think it’s fine for some courses to have only one overall goal.
☐ Making multiple short-term goals sounds complicated to me and stressful to make.
☐ I’d rather do more work than just making perfect short-term goals but never strictly follow them.
☐ I don’t like to keep myself busy all the time to finish short-term goals one after another.
☐ I want to have some degree of control over my own study efforts. Study less when I’m not in mood, but more when I am willing to.
☐ Others, please specify ________________________________.

Q3: Under what conditions do you think having multiple short-term goals can harm your motivation most?
☐ When I fall behind one or two short-term goals, I would feel agitated and frustrated to hold up my long-term goal.
☐ When I feel fatigued for having to catch up with goals one after another.
☐ When I can’t see noticeable improvement after finishing several short-term goals.
☐ When I can’t juggle with goals in other areas.
☐ Others, please specify ________________________________.

Q4: What’s the optimal time intervals in your mind for making short-term goals?
☐ Less than 1-week plan;
☐ 1-week plan;
☐ 2-week plan;
☐ 1-month plan;
☐ 2-month plan;
☐ More than 2-month plans;
☐ Others, please specify ________________________________.
**Section 4:** Implicit sense of gratification.

*Directions:* Please read each following statement carefully and choose the number that best describes your opinion. (Strongly Disagree (SD) = 1, Strongly Agree (SA) = 7)

<table>
<thead>
<tr>
<th>Statement</th>
<th>SD</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>When I successfully finish a self-made short-term goal within designated time limit, I felt quite happy about myself.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>When I barely finish a task assigned by my professor by the due dates, I felt more of relieved rather than truly satisfied.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I won't feel truly satisfied if I think the task/goal is too easy for me.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I won't feel truly satisfied if I think the task/goal is too hard for me either.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I won't feel truly satisfied if my tasks/goals are made on the spur of the moment without careful planning ahead of time.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I won't feel truly satisfied if I spend extended time to finish a task/goal.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I will feel truly satisfied if I can finish a task/goal before the due dates.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I still feel truly satisfied as long as I finish a task/goal in my pace without comparing with others' finishing speed.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

**Section 5:** Academic intrinsic motivation.

*Directions:* Please read each following statement carefully and choose the number that best describes your opinion. (Absolutely not describe me = 1, Absolutely describe me = 7)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Abs_Not_Me</th>
<th>Abs_Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>Even when I have studied for hours, I don't feel that I have studied enough.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I enjoy challenging tasks.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>In my studies, I set short term goals.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I have no doubts that I will achieve my academic goals.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>No matter how much I like or dislike a class, I still try to learn from it.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I feel that challenging assignments can be great learning experience.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Sometimes I do more than I have to for an assignment to help me understand the material better.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I like to spend time reading about things that interest me.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I sign up for the classes that will prepare me for the future.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I have high expectations of myself.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I feel good about myself when I finish a difficult project.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I set high goals for myself.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

=========THANKS FOR YOUR INPUT ONCE AGAIN========