

Examining Achievement Goal Orientations, Goal Setting, and Motivation Challenges from A
Self-Regulated Learning Perspective

by
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Abstract

Adopting a self-regulated learning perspective, the present study examined the mediating role of goal management practices in the relationship between achievement goal orientations and motivation challenges among 213 undergraduate students enrolled in a learning-to-learn course at a university in Western Canada. Structural equation modeling (SEM) was employed to analyze the data. The results indicated that mastery-approach goal orientation negatively predicted motivation challenges and that goal management practices served as a mediator in this relationship. However, this thesis did not find a significant predictive relationship between mastery-avoidance goal orientation, performance-approach goal orientation, as well as performance-avoidance goal orientation and motivation challenges. This study sheds light on the complexity of achievement goal orientations and the critical role of goal management practices in mediating the relationship between mastery-approach goal orientations and motivation challenges.

Keywords: achievement goal orientations, self-regulated learning, motivation challenges, goal setting, goal management practices, academic challenges

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Introduction

Post-secondary learners, especially first-year students, are struggling with unprecedented challenges. Even high-achieving high school students report facing new academic challenges at university (Hadwin et al., 2022a). Moreover, the outbreak of the COVID-19 pandemic posed new challenges for students. For example, Wang and Zhao (2020) found that university students showed higher anxiety during COVID-19. Researchers have identified various academic challenges university students encounter in motivation, goals and planning, cognition, and health and wellness (Koivuniemi et al., 2017). These academic challenges can significantly hinder university students' performance (Daniels et al., 2021). Among academic challenges students run into, motivation problems were most frequently reported (Hadwin et al., 2019). It is important to understand motivation challenges because encountering challenges early in one's university life leads to a range of deleterious outcomes including (a) personal outcomes such as failing to achieve potential or realize life and career goals, (b) motivational outcomes such as low motivation and self-efficacy, (c) a range of behavioural outcomes from disengaging from class and coursework to dropping out, and (d) experiencing poor performance outcomes such as failing or achieving a GPA that is lower than expected (e.g., Hadwin et al., 2019, 2022b).

Achievement goal orientations, the reasons or purposes for students to engage in certain tasks (Ames, 1992; Dweck & Leggett, 1988), have been shown to be associated with various outcomes especially motivation such as task value, interest, and self-efficacy (e.g., Middleton & Midgley, 1997; Pajares et al., 2000; Pintrich, 2000; Wolters et al., 1996). For example, mastery-approach goal orientation is generally adaptive and a positive predictor of task value and self-efficacy (Pintrich, 2000; Wolters et al., 1996) while mastery-avoidance goal orientation may lead to low interest and self-efficacy (Pintrich, 2000).

Winne and Hadwin (1998) suggested that achievement goal orientations influence students' practices in setting and managing task specific goals. In addition, studies show that goal setting predicts motivation challenges (Hadwin et al., 2022b). According to the authors, students who are engaged in more goal setting practices tend to report less motivational problems. Therefore, it is expected that the impact of achievement goal orientations on motivation challenge could be explained by goal setting. However, this assumption has not been examined in the literature to date. Hence, this study aims to investigate the relationship between achievement goal orientations and motivation challenges through the influence of goal setting. This study is essential for progressing the educational psychology field and designing appropriate interventions to improve students' learning outcomes.

Theoretical Frameworks for the Study

This study is grounded in two major theories: self-regulated learning (SRL) and achievement goal orientations. In the next section, an introduction to each theory will be provided.

Theories of Self-regulated Learning

Self-regulated learning (SRL) refers to an active and deliberate process in which students metacognitively monitor, assess, and control their behaviour, cognition, motivation, and emotions while striving toward goals (Pintrich, 2000; Winne & Hadwin, 1998; Zimmerman, 2000). Three SRL models are the most well-known such as Pintrich's three-phase model (2000), Zimmerman's four-phase model (2000) and Winne and Hadwin's four-phase model (1998). Particularly, Winne and Hadwin's SRL model stands out because of the "COPES" mechanism or structure they proposed. COPES refers to conditions, operations, products, evaluations, and

standards (Winne & Hadwin 1998). For example, *conditions* are resources that will affect the engagement in studying such as motivational beliefs and previous knowledge; *products* are information produced during each phase of studying as self-regulated learning.

All SRL models, regardless of specific phases or mechanisms, acknowledge the importance of goal setting. For instance, the forethought phase in Pintrich's SRL model (2000) involves goal setting. Learners use goals as standards in their learning to evaluate and monitor their progress toward the task (Pintrich, 2000). Similarly, Zimmerman's SRL framework prioritizes goal setting in earlier stages of learning. He argued that the attainment of goals can boost self-efficacy and intrinsic interest of learners (Zimmerman, 2000). Additionally, Winne and Hadwin (1998) differentiated goal setting from task understanding (learners' interpretation of the task at hand), which allows for a more nuanced examination of the planning processes in SRL and complements Pintrich and Zimmerman' work by unpacking the underlying processes during learning and reconceptualizing some of the phases (Greene & Azevedo, 2007). During the goal setting and planning phase in Winne and Hadwin's model (1998), students generate specific goals and make a plan for completing the task. Moreover, COPES in Winne and Hadwin's model (1998) can be used to understand the cognitive mechanisms contributing to goal setting in SRL. To be more specific, motivational beliefs students hold about tasks are *conditions* that shape goals and plans for a study episode. For instance, if students adopt a mastery-approach goal orientation, they may set their goals to learn, comprehend, or understand as many things as possible. They might choose a challenging topic to master new skills although there is a risk of getting a lower grade. Based on discussions above, Winne and Hadwin's SRL model (1998) will serve as a theoretical framework for this study.

Introducing Achievement Goal Orientations

The other theory for this study is the achievement goal orientation theory. In the educational arena, researchers have been pondering what gives rise to students' achievement-related behaviors and why students are engaged in these behaviors. To this purpose, achievement goal theory was proposed to explain the reasons or purposes students adopt while engaged in academic work (e.g., Ames, 1992; Dweck & Leggett, 1988). Early work in the achievement goal orientation area tended to dichotomize achievement goal orientations (e.g., Ames & Archer, 1988; Dweck, 1986; Midgley et al., 1996, 1998; Nicholls, 1984). For example, Dweck and colleagues (Dweck, 1986; Dweck & Leggett, 1988) proposed two goal orientations in achievement situations: learning goal orientation and performance goal orientation. Individuals adopting a learning goal orientation seek to increase their ability or master new skills, while individuals adopting a performance goal orientation strive to gain positive judgments of their ability and avoid negative judgements (Dweck, 1986).

Although most researchers at that time conceptualized achievement goals dichotomously, Elliot and colleagues first differentiated between approach orientation and avoidance orientation in performance goals and proposed trichotomous goal orientations: (a) performance-approach goal orientation, which focuses on the demonstration of competence, (b) performance-avoidance orientation, which aims at avoiding the demonstration of incompetence, and (c) mastery goal orientation, which focuses on competence development and task mastery (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). Later, realizing the importance of the distinction between approach and avoidance goal orientations and hoping to provide a more precise definition of goal orientations grounded in competence, Elliot and McGregor (2001) proposed a 2 x 2 achievement goal framework incorporating (a) mastery-approach goal orientation, which focuses on attaining task-based or intrapersonal competence, (b) mastery-avoidance goal orientation, which focuses

on avoiding task-based or intrapersonal incompetence, (c) performance-approach goal orientation, which emphasizes attaining normative competence, and (d) performance-avoidance goal orientation, which focuses on avoiding normative incompetence. The factor analytic results supported the independence of the four achievement goal orientations (Elliot & McGregor, 2001).

Elliot and McGregor (2001)'s 2 x 2 model serves as the theoretical framework for this study for two reasons: (a) most studies either focus on all four goal orientations or performance-approach and mastery-approach goal orientations specifically (Senko et al., 2011), and (b) Elliot and McGregor (2001)'s 2 x 2 model adds complexity to understanding how each achievement goal orientation differ conceptually and empirically.

An SRL Approach to Examining Achievement Goal Orientations, Goal Setting, and Motivation Together

Studies (e.g., Elliot & Murayama, 2008; Middleton & Midgley, 1997; Pajares et al., 2000; Pintrich, 2000; Wolters et al., 1996) have shown that achievement goal orientations are associated with various motivational constructs such as (a) task value, the values individuals perceive when engaging in tasks (Eccles et al., 1983), (b) interest, psychological state of engaging with particular objects, events, or ideas over time (Hidi & Renninger, 2006), (c) self-efficacy, individuals' confidence in their abilities of doing a task, solving a problem, or achieving a goal (Bandura, 1997), and (d) intrinsic motivation, the inherent interest and enjoyment in engaging activities for their own sake (Deci & Ryan, 2000). The next section will focus on unpacking the findings between achievement goal orientations and motivational outcomes and

investigating the influence of goal setting on the relationship between achievement goal orientations and motivational outcomes.

How Do Achievement Goal Orientations Predict Motivational Outcomes?

Achievement goal orientations have been found to be associated with a range of motivational outcomes. One thing worth keeping in mind when perusing these findings is that the results differ in terms of the strength and direction of those relationships depending on the types of goal orientations being examined. For example, mastery-approach goal orientation tends to be associated with higher motivation (e.g., Elliot et al., 1999; Wolters et al., 1996), while performance-avoidance goal orientation is associated with lower motivation (e.g., Elliot & Murayama, 2008).

Mastery-approach goal orientation predicts persistence, effort, self-efficacy, task value, interest and intrinsic motivation (e.g., Elliot et al., 1999; Hulleman et al., 2010; Pintrich, 2000; Wolters et al., 1996;). For example, learning goal orientation (similar to mastery-approach goal orientation in this thesis) is a strong predictor of task value and self-efficacy in Grade 7 and Grade 8 students (Wolters et al., 1996). Moreover, Elliot and Murayama (2008) found that mastery-approach goal orientation was a positive predictor of intrinsic motivation among undergraduate students. Furthermore, Hulleman and colleagues (2010)'s meta-analysis showed that mastery-approach goal orientation was positively correlated with interest. In sum, mastery-goal orientation can positively predict motivation.

Mastery-avoidance goal orientation is a mix of adaptive (mastery) and maladaptive (avoidance) motivational forces (Elliot, 1999). Regarding the relationship between mastery-avoidance goal orientation and motivation, Pintrich (2000) claimed that this goal orientation can generate some negative motivational beliefs like low interest and self-efficacy. This claim was

supported by Hulleman et al. (2010)'s meta-analysis that showed avoidance goal orientation was negatively correlated with interest. However, Elliot and Murayama (2008) found that mastery-avoidance goal orientation failed to predict intrinsic motivation, which might be a result of that the positive and negative components of mastery-avoidance goal cancelled each other out. Nonetheless, Senko and Freund (2015) suggested that the avoidance element in mastery-avoidance is more salient than the mastery element. Thus, it is expected that the mastery-avoidance goal orientation is prone to correlate with negative outcomes. For example, studies showed that mastery-avoidance goal orientations can positively predict various maladaptive outcomes such as disorganization, worry, and emotionality (Elliot & McGregor, 2001). Hence, overall speaking, mastery-avoidance orientation is more associated with low motivation.

Performance-approach goal orientation was found to positively predict higher efficacy and task value of Grade 7 and Grade 8 students (Wolters et al., 1996) as well as undergraduates' persistence and effort (Elliot et al., 1999). For example, Elliot et al. (1999) examined achievement goal orientations as predictors of motivational strategies and other outcomes in undergraduates enrolled in an introductory psychology course, and their results showed that performance-approach goal orientation was a positive predictor of persistence and effort. However, performance-approach goal orientation did not predict intrinsic motivation in undergraduates (Elliot & Murayama, 2008). Although the findings between performance-approach goal orientation and motivation are also mixed, more positive relationships (e.g., Elliot et al., 1999; Wolters et al., 1996) have been found than null relationship (e.g., Elliot & Murayama, 2008). Based on this, it is reasonable to summarize that performance-approach goal orientation tends to positively predict motivation.

Performance-avoidance goal orientation negatively predicted intrinsic motivation (Elliot, 1997; Elliot & Murayama, 2008), academic self-efficacy (Middleton & Midgley, 1997), self-efficacy for self-regulated learning and writing self-concept (Pajares et al., 2000), and interest (Elliot & Harackiewicz, 1996; Jögi et al., 2015; Middleton & Midgley, 1997). For instance, Pajares and colleagues (2000) investigated the relationship between achievement and motivation constructs among Grade 6 to Grade 8 students and suggested that performance-avoidance goal orientation was negatively associated with self-efficacy. However, Elliot et al. (1999) found that performance-avoidance goal orientation did not predict persistence nor effort. To sum it up, the majority of past studies have established a negative relationship between performance-avoidance goal orientations and motivation (e.g., Elliot & Harackiewicz, 1996; Elliot & Murayama, 2008; Middleton & Midgley, 1997; Jögi et al., 2015; Pajares et al., 2000), so it is expected that this goal orientation can negatively predict motivation.

Motivation Challenges as An Alternative Way to Measure Motivation

The review of studies about the influence of achievement goal orientations reveals mixed findings about the ways goal orientations impact motivational outcomes. One possible explanation for the mixed findings is that studies focused on single motivational aspects such as self-efficacy, interest or task value, but rarely examined more global aspects of motivation comprising multiple dimensions.

For the proposed study, I examined a more global measure of motivation, termed as motivation challenges proposed by Hadwin et al. (2022b). Motivation challenges measure the degree to which aspects of motivation (e.g., self-efficacy, task value, and persistence) are problematic for students. One advantage of using motivation challenges is that they are less prone to the desirability bias, where students feel compelled to appear motivated, even if they are

not. Instead, in this study students were prompted to rate to what extent they struggled in motivation. Facing challenges is a natural part of the learning process and provides opportunities for growth. Furthermore, motivation challenges have been shown to be a strong negative predictor of performance (e.g., GPA, Bahena-Olivares et al., 2022; Hadwin et al., 2022b). Therefore, motivation challenges have the potential to provide a robust measure of motivation experiences during studying.

How Do Achievement Goal Orientations Predict Motivation Challenges?

Although motivation challenges have not been directly examined as an outcome associated with achievement goal orientations, I posit that goal orientations should be associated with motivation challenges because strong relationships between achievement goal orientations and specific components of motivation have been established in research to date. Specifically, if a positive relationship between a goal orientation and motivation is found, then it is expected that a negative relationship should exist between this goal orientation and motivation challenges.

Investigating the Influence of Goal Setting

Having established the predictive relationship between different goal orientations and motivational outcomes, I will investigate the role of goal setting in the relationship in this section. From a self-regulated learning perspective, goal orientations are beliefs students hold, but it is what they do with these beliefs that influence the learning and motivational outcomes. Goal orientations influence motivation because of the goal setting processes deployed by learners (Brett & VandeWalle, 1999).

Achievement Goal Orientations Predict Goal Setting

Winne and Hadwin (1998) suggested that the goal-related beliefs students hold about academic work (e.g., goal orientations) should contribute to the goals they generate for tackling their academic work. Motivational beliefs students hold about tasks are *conditions* that shape goals and plans for a study episode. For example, students with a performance-approach goal orientation that view tasks as jobs to complete may set their standards to levels where they can just get by (Winne & Hadwin, 1998), whereas students with a mastery-approach goal orientation that view tasks as opportunities to learn new skills will put in effort and time to pull off a good work no matter what.

Additionally, Brett and VandeWalle (1999)'s study on post-secondary students also found that goal orientation did not affect performance directly; rather it was mediated by the goals students set. Specifically, students with a learning goal orientation (similar to mastery-approach goal orientation in this study) tend to select a learning goal while those with a performance goal disposition (similar to performance-approach goal orientation in this study) tend to select a performance goal that they believe is attainable. Moreover, Taing et al. (2013) also had similar findings that showed goal setting mediated the relationship between learning goal orientation and performance, which is in line with VandeWalle et al. (2001) who also found evidence for the mediating role of goal difficulty in the relationship between learning goal orientations and performance. To sum up, extant literature has suggested that goal orientations influence goal setting.

Goal Setting Influences Motivational Outcomes

Goal setting has also been found to predict motivational outcomes. For example, students who set goals for themselves had higher self-efficacy than students who were assigned to goals

(Schunk, 1985). Also, Schunk (1990) suggested that specific goals promoted self-efficacy than general goals, and proximal goals led to greater motivation than distant goals. In addition, Hadwin et al. (2022b) showed that the practices of goal setting negatively predicted motivation challenges university students encountered. This finding is further supported by Bahena-Olivares et al. (2022)'s study.

Measuring Goal Setting Using Goal Management Practices

On an important note, when it comes to measuring goal setting, existing literature has been quite inconsistent. For example, Taing et al (2013) assessed participants' goal setting by asking them to set an initial course grade goal for themselves, whereas VandeWalle et al. (2001) measured their goal setting by asking participants the number of units they intend to, which they referred to as goal level. Inconsistencies in measuring goal setting make it challenging to generalize results to other populations and replicate research findings. Also, these studies have primarily focused on one aspect of goal setting (e.g., the content, or the level) rather than examined the multi-faceted processes involved in goal setting.

To solve this problem, Hadwin et al. (2022b) proposed goal management practices (GMP) to measure goal setting learners engage in during studying. GMP refers to the processes or actions students are engaged in during the goal setting and planning phase in self-regulated learning. GMP taps into adaptative practices in goal setting and planning such as setting goals that are useful to check progress, making goals to learn or understand, identifying specific content, ideas, or terms in their goals, and assessing goal attainment (Hadwin et al., 2022b). This new measurement of goal setting is advancing the literature in that (a) GMP is generally applicable to any subject students are learning; it is independent of the specific task or subject learners are working on, and (b) it is easy to measure goals students set in situ by asking

participants to rate on different goal-related items on a 5-point Likert scale (See the Measurement section for details).

Therefore, based on discussions among achievement goal orientations, goal setting, and motivation challenges, it is reasonable to assume that goal orientations contribute to motivation challenges because they influence goal setting (GMP in this study).

Purpose and Research Questions

The purpose of this study is to examine whether goal management practices, or the extent to which students report engaging in practices characteristic of the goal setting and planning phase of SRL can explain the relationship between each of the achievement goal orientations and motivation (in this study motivation challenges) among undergraduate students.

Research Question 1: Do Goal Orientations Predict Motivation Challenges?

Hypothesis 1_a: Mastery-approach goal orientation will negatively predict motivation challenges.

Hypothesis 1_b: Mastery-avoidance goal orientation will positively predict motivation challenge.

Hypothesis 1_c: Performance-approach goal orientation will negatively predict motivation challenges.

Hypothesis 1_d: Performance-avoidance goal orientation will positively predict motivation challenges.

Research Question 2: Do Goal Management Practices Mediate the Relationship Between Achievement Goal Orientations and Motivation Challenges?

Hypothesis 2_a: Goal management practices will mediate the relationship between mastery-approach goal orientations and motivation challenges.

Hypothesis 2_b: Goal management practices will mediate the relationship between mastery-avoidance goal orientations and motivation challenges.

Hypothesis 2_c: Goal management practices will mediate the relationship between performance-approach goal orientations and motivation challenges.

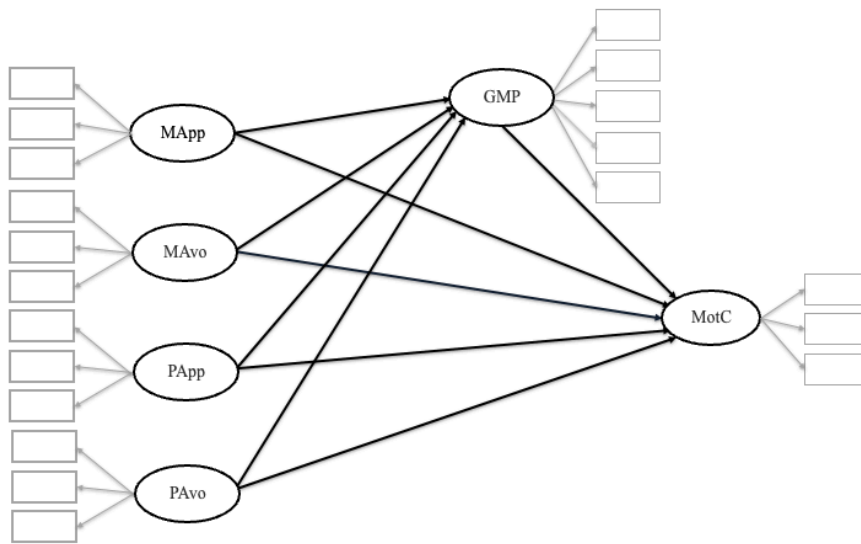
Hypothesis 2_d: Goal management practices will mediate the relationship between performance-avoidance goal orientations and motivation challenges.

Research Design

This proposed study will test a mediation model shown in Figure 1 using structural equation modelling (SEM). SEM provides researchers with comprehensive methods to test a priori theory in a more reliable way by considering measurement errors that are ubiquitous in most studies (Raykov & Marcoulides, 2012). Four kinds of goal orientations will be examined as predictors in this study including: mastery-approach goal orientation, mastery-avoidance goal orientation, performance-approach goal orientation, and performance-avoidance goal orientation. Motivation challenges will be examined as the outcome, and goal management practices will be the mediator variable.

Figure 1

The Proposed Model Among Achievement Goal Orientations, Goal Management Practices, and Motivation Challenges



Note. MApp = Mastery-approach goal orientation; MAvo = Mastery-avoidance goal orientation; PApp = Performance-approach goal orientation; PAvo = Performance-avoidance goal orientation; GMP = Goal management practices; MotC = Motivation challenges. For simplicity, error items and covariances between predictors are omitted.

Methods

Participants

Participants were undergraduate students ($N = 213$, M age = 19.32 years, 48% female, 52% male) enrolled in a learning-to-learn course at a Western Canadian university. Students enrolled in this course completed the scales as part of course requirements. All participants gave consent to participate in research.

Pandemic Context

Data for this study were collected during Fall 2021¹, which was the first on-campus term since the outbreak of COVID-19. Specifically, the content of this course was provided asynchronously online. A weekly lab session was required for exercising SRL strategies and activities, which required attendance either in-person or online.

Measures

Achievement Goal Orientations

The Achievement Goal Questionnaire-Revised (AGQ-R, Ω :.79) was developed by Elliot and Murayama (2008) to measure achievement goal orientations. AGQ-R was adopted rather than Patterns of Adaptive Learning Scales (PALS, Midgley et al., 2000) is to examine how each of the four types of goal orientations influence motivational challenges. PALS only includes three goal orientations without mastery-avoidance goal orientations. To better fit this study's research context, wording of some AGQ-R items was modified slightly (See Table A1 in Appendix A for a comparison between original items and adapted items). AGQ-R has four subscales measuring mastery-approach goal orientation (Ω : .73), mastery-avoidance goal orientations (Ω : .74), performance-approach goal orientation (Ω : .83), and performance-avoidance goal orientation (Ω : .85). Each subscale has three items (e.g., "This semester my aim is to completely master the material presented in my courses"). Participants rated each statement on a 5-point Likert scale ranging from *1 strongly disagree* to *5 strongly agree*. High scores mean strong orientations.

Goal Management Practices

¹ The learning-to-learn course was offered in a blended format with lecture modules were delivered asynchronously online and the lab components offered both on campus and online. Students who registered in-person labs were also allowed to attend online labs in the event of illness.

Goal Management Practices (GMP) subscale is a unidimensional measure from the multidimensional SRL-Practices scale in the Self-regulated Learning Profile and Self-Diagnostic Tool (SRL-PSD-2021, Hadwin et al., 2022b). GMP subscale (Ω : .86) includes five items examining self-regulatory actions used to optimize goal setting during studying (e.g., "Set goals for my work", see Table A2 in Appendix A). Participants were asked to rate how true each statement was for them over the last two weeks on a 5-point Likert scale ranging from 1 *Never true* to 5 *Always true*. High scores mean more self-reported engagement with goal management practices.

Motivation Challenges

Motivation challenges subscale is a unidimensional measurement from the multidimensional SRL-Challenges scale in the SRL-PSD-2021 instrument (Hadwin et al., 2022b). Motivation challenges subscale (Ω : .72) consists of three items. The instruction for this subscale is "The following are the list of things that can make studying and learning at university difficult. Think about the past 2 weeks when you rate how true of you each statement was for you. Over the past two weeks, I struggled with ...". One sample item is "Believing I can do my work" (See Table A3 in Appendix A). Participants rated those items on a 5-point Likert scale ranging from 1 *Never true* to 5 *Always true*. Higher scores indicate higher degree of challenge encountered with motivational aspects of studying.

Procedure

We aimed to decolonize educational psychology research by utilizing reciprocal research practices with learners. Our priority was to collect data that learners could utilize to reflect on and adjust their learning practices. The Fall term spanned 12 weeks, during which students completed self-assessment scales every week, corresponding to the course topic of the week.

Customized reports were provided to students, summarizing their responses to scales and encouraging them to analyze, critique, interpret, and discuss the implications for their own growth, change, or academic success. Over the semester, students were engaged in this type of data-based self-study on a range of topics and measures. During week nine, students completed the online scale on achievement goal orientations, with the concurrent course topic being Motivation and SRL. In week 11², the SRL-PSD-2021 scale (Hadwin et al., 2022b) was completed including (a) the goal management practices subscale, and (b) the motivation challenges subscale.

Analysis

First, preliminary descriptive statistics (means, standard deviation/SD, skewness and kurtosis) provided information about the distribution of the data. Second, a confirmatory factor analysis (CFA) was conducted to test the psychometric properties of achievement goal orientations given the items were reworded slightly for this study. Third, a structural equation model (SEM) model was used to examine (a) the predictive relationships between four achievement goal orientations and motivation challenges, and (b) the hypothetical mediation effect of goal management practices using bootstrap process.

Results

Preliminary Analysis

² SRL-PSD was also administered early in week three. For this study, however, I am interested in students goal management practices and motivation challenges experienced later in the semester when they were fully engaged in their academic studies.

Means, standard deviations (SD), skewness, and kurtosis for each item in three scales were generated by Mplus (Version 8.8, Muthén & Muthén, 1998-2017). The skewness and kurtosis for all items ranged from +1 to -1 except for the MAvo2 item (“I am striving to avoid an incomplete understanding of the material in my courses”) with an excess kurtosis of 1.55 (See Appendix B for more details). Correlation coefficients among variables are shown in Table 1. Performance-approach goal orientation is strongly associated with performance-avoidance goal orientation ($r = .83$).

Table 1

The Standardized Correlation Matrix Among Achievement Goal Orientations, Goal Management Practices, and Motivation Challenges

	GMP	MApp	MAvo	PApp	PAvo	MotC
GMP	1					
MApp	.54***	1				
MAvo	.04	.44***	1			
PApp	-.05	.24**	.32***	1		
PAvo	-.11	.01	.23**	.83***	1	
MotC	-.40***	-.36**	-.12	-.03	.01	1

Note. *** Correlation is significant at the 0.001 level. ** Correlation is significant at the 0.01

level. * Correlation is significant at the 0.05 level. GMP = Goal management practices; MApp =

Mastery-approach goal orientation; MAvo = Mastery-avoidance goal orientation; PApp =

Performance-approach goal orientation; PAvo = Performance-avoidance goal orientation; MotC

= Motivation challenges.

Confirmatory Factor Analysis

First, using Mplus (Version 8.8; Muthén & Muthén, 1998-2017), I conducted a CFA to examine the model goodness-of-fit indices of achievement goal orientations scale since the items were slightly reworded to fit in this study’s context. Common model fit indices include chi-square

(χ^2), degree of freedom (df), the comparative fit index (CFI), Tucker-Lewis Fit Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Residual (SRMR). The measurement model demonstrated an acceptable fit to the data, χ^2 (48, N = 213) = 87.96, p < .001, CFI = .960, TLI = .945, RMSEA = .063, SRMR = .061. Standardized regression weights are reported in Table 2. Most loadings were above 0.5 except for MAvo2 (0.34).

Second, I tested a full measurement model that included the variables of achievement goal orientation, goal management practices, and motivation challenges. The overall fit of this measurement model was good: χ^2 (155, N = 213) = 193.64, p = .02, CFI = .976, TLI = .971, RMSEA = .034, SRMR = .056. All indicator measures loaded significantly on their corresponding latent constructs with critical ratios ranging from 4.74 to 29.95 (all ps < .001). Standardized regression weights are also reported in Table 2.

Table 2

Standardized Factor Loadings for Each Item in the Model

Model	Factor	Item	Est.	S. E	Est./S.E.	P
AGQ-R	MApp1	This semester my aim is to completely master the material presented in my courses.	.71	.05	13.92	< .001
	MApp2	I am striving to understand the content of my courses as thoroughly as possible.	.71	.05	13.93	< .001
	MApp3	My goal is to learn as much as possible this semester.	.62	.06	11.20	< .001
	MAvo1	This semester is to avoid learning less than I possibly could.	.81	.06	14.77	< .001
	MAvo2	I am striving to avoid an incomplete understanding	.34	.07	4.74	< .001

		of the material in my courses.				
	MAvo3	This semester, my goal is to avoid learning less than it is possible to learn.	.73	.05	13.59	< .001
	PApp1	My aim this semester is to perform well relative to other students.	.84	.03	29.59	< .001
	PApp2	I am striving to do well compared to other students this semester.	.84	.03	29.95	< .001
	PApp3	This semester, my goal is to perform better than the other students.	.74	.04	20.41	< .001
	PAvo1	My aim is to avoid doing worse than other students this semester.	.81	.03	26.26	< .001
	PAvo2	This semester, I am striving to avoid performing worse than others.	.78	.03	23.06	< .001
	PAvo3	My goal this semester is to avoid performing poorly.	.82	.03	26.51	< .001
GMP	GMP1	Set goals for my work	.77	.04	21.94	< .001
	GMP2	Made goals to learn, understand, or remember	.81	.03	25.70	< .001
	GMP3	Set goals that would be useful for checking my progress	.78	.03	23.27	< .001
	GMP4	Identified specific content, ideas, or terms in my goals	.64	.05	14.01	< .001
	GMP5	Assessed my goal attainment	.69	.04	16.44	< .001
MotC	MotC1	Believing I can do my work	.68	.06	11.69	< .001

MotC2	Feeling like my work was worth doing	.70	.06	11.63	< .001
MotC3	Persisting when things got tough	.64	.06	10.80	< .001

Note. AGQ-R = Achievement goal orientations revised; MApp = Mastery-approach goal orientation; MAvo = Mastery-avoidance goal orientation; PApp = Performance-approach goal orientation; PAvo = Performance-avoidance goal orientation; GMP = Goal management practices; MotC = Motivation Challenges.

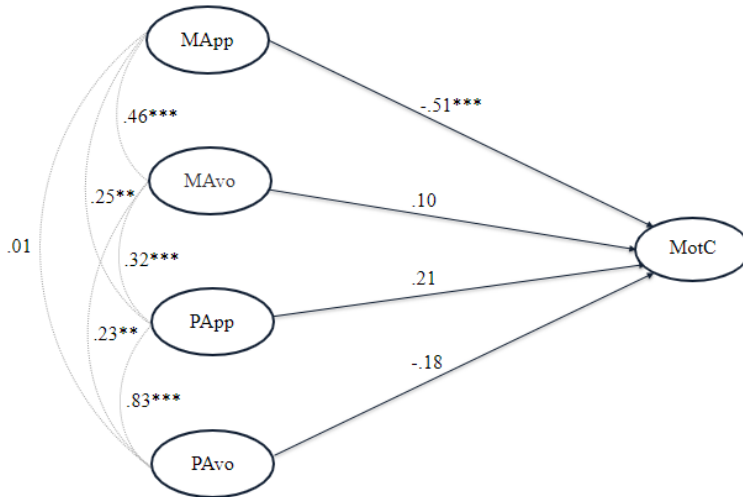
Structural Equation Modelling

Research Question 1: Do Goal Orientations Predict Motivation Challenges?

To answer the first research question, I ran an SEM regression analysis to examine predictive relationships of achievement goal orientations on motivation challenges without goal management practices in the model. The indices of model fit were good, $\chi^2 (156, N = 213) = 200.01, p = .01, CFI = .973, TLI = .967, RMSEA = .036, SRMR = .060$. Results showed that mastery-approach goals negatively predicted motivation challenges ($\beta = -.51, p < .001$). However, mastery-avoidance goal orientation and performance-oriented goal orientations did not predict motivation challenges in this model (see Figure 2).

Figure 2

Motivation Challenges Regressed on Four Achievement Goal Orientations



Note. *** significant at the 0.001 level. ** significant at the 0.01 level. Dotted lines represent correlation coefficients among predictors. Observed variables and error items are omitted for ease of reading. Estimates are standardized. MApp = Mastery-approach goal orientation; MAvo = Mastery-avoidance goal orientation; PApp = Performance-approach goal orientation; PAvo = Performance-avoidance goal orientation; MotC = Motivation challenges.

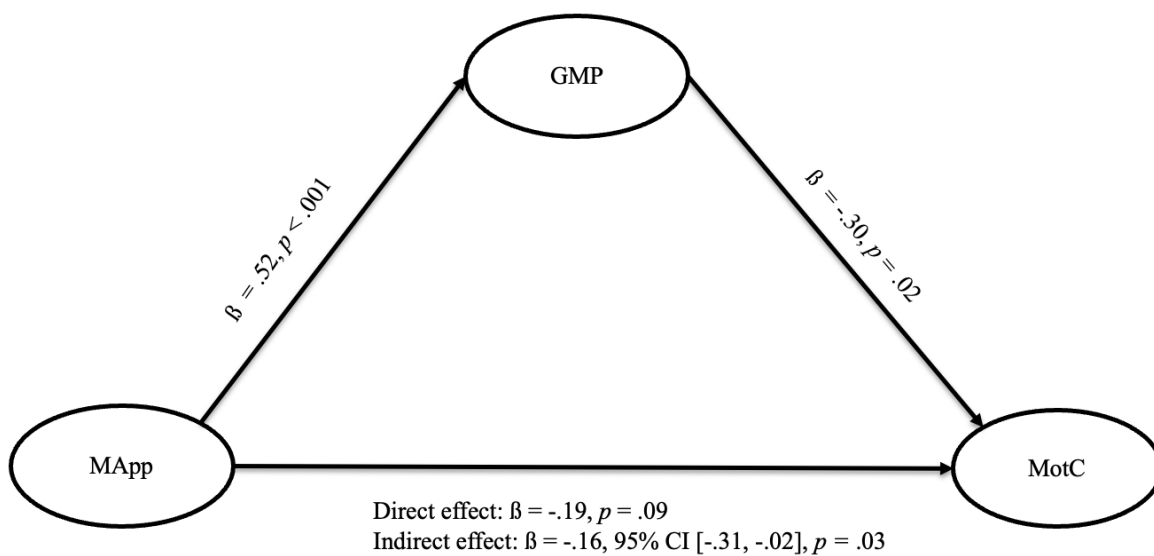
Research Question 2: Do Goal Management Practices Mediate the Relationship Between Achievement Goal Orientations and Motivation Challenges?

To answer the second research question, I ran a mediation analysis with mastery-approach goal orientation as the predictor (Figure 3). This model demonstrated a good fit to the data, $\chi^2(161, N = 213) = 202.80, p = .01, CFI = .974, TLI = .969, RMSEA = .035, SRMR = .062$. The mediation results showed that mastery-approach goal orientation positively predicted GMP ($\beta = .52, p < .001$), and GMP negatively predicted motivation challenges ($\beta = -.30, p = .02$). However, mastery-approach were no longer associated with motivation challenges when GMP was included in the model ($\beta = -.20, p = .09$).

Using a bootstrap procedure with 1,000 bootstrapping samples and a 95% bias-corrected confidence interval, I examined the indirect effects of mastery-approach goal orientation on motivation challenges. The result showed that GMP mediated the relationship between mastery-approach goals and motivation challenges. The significance of the indirect effect was supported by the fact that the confidence intervals for the indirect effect did not contain zero ($\beta = -.15$, 95% CI [-.29, -.02]).

Figure 3

Mediation Model Results



Note. MApp = Mastery-approach goal orientation; GMP = Goal management practices; MotC = Motivation Challenges. For simplicity, observed variables and error items are omitted.

Discussion

This thesis examined whether achievement goal orientations can predict motivation challenges and whether goal setting (goal management practices in this study) can mediate the

relationship among undergraduate students. Overall, the findings partly supported the hypotheses in showing that mastery-approach goal orientations negatively predicted motivation challenges. In addition, the results showed that goal management practices mediated the relationship between mastery-approach goal orientation and motivation challenges.

First, regarding the psychometric properties of the Achievement Goal Questionnaire-Revised (AGQ-R, Elliot & Murayama, 2008) scale, the model fit indices indicated an acceptable model, $\chi^2(48, N = 213) = 87.96, p < .001, CFI = .960, TLI = .945, RMSEA = .063, SRMR = .061$. It is important to note that it is desirable for all interrelationship coefficients between constructs to be as low as possible. Nonetheless, the correlation coefficient between performance-approach goal orientations and performance-avoidance goal orientations in our data sample was notably high (.83). This finding is consistent with Elliot and Murayama's (2008) study, where the intercorrelation between these two constructs was .68. This result indicates that these two goal orientations are distinct but strongly related constructs.

Do Goal Orientations Predict Motivation Challenges?

First, results of this thesis showed that only mastery-approach goals negatively predicted motivation challenges, which is consistent with the majority of past studies on mastery-approach goal orientations. For example, past studies showed that mastery-approach goal orientations were related to self-efficacy, task value, interest (Pintrich, 2000; Wolters, 1996), and intrinsic motivation (Hulleman et al., 2010). Elliot and Murayama (2008) found that mastery-approach goals were a positive predictor of intrinsic motivation within undergraduate students. Similarly, Wolters (1996) found that even after accounting for students' previous motivational beliefs, mastery-approach goals were still strong predictors of task value and self-efficacy. Drawing from

those studies, findings from this study supported the hypothesis that students holding mastery-approach goal orientations would be less likely to encounter *motivational* challenges.

Second, the results showed that mastery-avoidance goal orientation did not predict motivation challenges, which is in contradiction with the hypothesis and some of previous studies which found that mastery-avoidance goal orientation positively correlated with interest (e.g., Hulleman et al. 2010). However, since mastery-avoidance goal orientations are in essence a mix of adaptive (mastery) and maladaptive (avoidance) motivational forces (Elliot, 1999), it is possible that the positive and negative components of mastery-avoidance goals cancelled each other out. Indeed, some past studies did not find a significant relationship between mastery-avoidance goal orientations and motivational outcomes either. For instance, Elliot and Murayama (2008) found that mastery-avoidance goal orientation failed to predict intrinsic motivation, a finding consistent with the current study. Elliot and Murayama (2008) described mastery-avoidance goal orientations as a perplexing motivational hybrid, and it is simply unclear how these two components operate together. Findings of this thesis on mastery-avoidance goal also point to the complexity of this goal orientation.

Third, contrary to the hypothesis, a predictive relationship between performance-approach goal orientation and motivation challenges was not found in this study. Historically, performance-approach goal orientations were both found to be positively related to higher motivation such as efficacy and task value (Wolters et al., 1996) and persistence (Elliot et al., 1999). However, a study showed that performance-approach goal orientation did not predict intrinsic motivation in undergraduates (Elliot & Murayama, 2008), which is somewhat congruous with what this thesis has found.

Finally, as for the relationship between performance-avoidance goal orientation and motivation challenges, previous research show that this goal orientation negatively predicted intrinsic motivation (Elliot, 1997; Elliot & Murayama, 2008), academic self-efficacy (Middleton & Midgley, 1997), self-efficacy for self-regulated learning and writing self-concept (Pajares et al., 2000), and interest (Elliot & Harackiewicz, 1996; Jögi et al., 2015; Middleton & Midgley, 1997). However, one study told a different story. Elliot et al. (1999) found that performance-avoidance goal orientation did not predict persistence nor effort, which partly supported the finding of this thesis.

Two things are noteworthy when interpreting the findings on the relationships between achievement goal orientations and motivational challenges. First, measures used in this study are different from other studies. For example, to measure goal orientations, Wolters et al. (1996) adapted from the Patterns of Adaptive Learning Survey (PALS, Midgley et al. 1996); Elliot et al. (1999)'s achievement goal questionnaire was adapted from Elliot and Church (1997). However, this study used Achievement Goal Questionnaire–Revised (AGQ-R, Elliot & Murayama, 2008). Second, past studies investigated specific motivational outcomes such as *task value* and *self-efficacy* (e.g., Wolters et al., 1996). However, this study examined *motivation challenges* proposed by Hadwin et al. (2022b), which is an alternative way to measure motivation but has nuanced difference from other motivational outcomes such as *task value* or *self-efficacy*.

Do Goal Management Practices Mediate the Relationship Between Achievement Goal Orientations and Motivation Challenges?

Results of this study indicate that GMP mediates the relationship between mastery-approach goals and motivation challenges. In other words, mastery-approach goal orientations

influence motivation challenges through GMP. This finding is consistent with Winne and Hadwin's (1998) model, which suggests that the goal orientations students adopt shape their goals and plans for studying. It suggests that students with mastery-approach goal orientation are more likely to engage in goal management practices, such as setting goals for their study, making goals to learn, remember, and understand, or assessing their goal attainment. This, in turn, explains the relationship between mastery-approach goal orientation and motivational challenges. Furthermore, the finding on the mediation effect of goal management practices aligns with Brett and VandeWalle's (1999) study, which found that goal orientations influenced performance through the goals students set, and with Taing et al.'s (2013) study, which also showed that goal setting mediated the relationship between learning goal orientation and performance.

Significance and Implications

The theories of achievement goal orientation and self-regulated learning have undergone extensive research, however, there has been limited exploration of their interplay in relation to goal setting and motivation challenges. This thesis makes two significant contributions to the field. Firstly, it employs a self-regulated learning perspective to provide insights into how achievement goal orientations impact students' motivation in academic challenges. Specifically, it investigates the critical role goal management practices play in the relationship between achievement goal orientations and motivation challenges. Second, this study focuses on students' perceptions of the motivational challenges they encountered during recent studying episodes rather than their reports of motivational states. In doing so, we attempted to ask students about motivational experiences in ways that might be less sensitive to a desirability effect and stimulate

metacognitive reflection about goal practices and motivational difficulties encountered during recent studying.

Regarding the implications of this study to educational practice, findings support past research that mastery-approach goal orientations are beneficial to students in terms of mitigating motivation problems for them. This has important implications for educators and policymakers. By fostering a learning environment that encourages students to focus on their own learning and development, rather than simply competing with others or seeking external validation, we can help students mitigate motivation problems that may undermine academic performance and overall well-being. Moreover, students with a mastery-approach goal orientation are more likely to adopt a growth mindset, where they view their abilities and intelligence as malleable and capable of improvement through effort and dedication (Dweck, 2006). In addition, this thesis suggests that the impact of mastery-approach goal orientation on motivation challenges is not direct, but rather is through goal management practices. Students holding mastery-approach goal orientations are more likely to exercise goal management practices such as setting goals for studying, identifying specific content in goals, or assessing goal attainment. This leads to a lower likelihood of experiencing motivation problems in university. Thus, educators should also focus on promoting and developing these goal management practices helping students mitigate motivation challenges in their academic journey.

Limitations and Future Directions

First, the data for this study was collected during COVID-19 when students were back on campus but with many restrictions on campus and in their communities. Most courses had a blended component. These were not "normal times" prior to the pandemic; thus, results need to

be interpreted with caution in mind. For example, it is not clear if academic challenges were higher during these times or if students felt more supported academically by the blended delivery options.

Second, it should be noted that the participants in this study were college students who were enrolled in a learning-to-learn course. Therefore, this sample was not randomly selected, and it is possible that these participants differ from the average university student as they had the intention of improving their self-regulated learning abilities and skills by registering for the course. It is important for readers to consider this when interpreting the results of the study. For instance, there might be more variabilities in students' goal management practices if data were collected from random samples. Future research should investigate if goal management practices explain the relationship between achievement goal orientations and motivation challenges when no goal management support or instruction has been provided.

Third, due to the scope of a master's thesis and sample size, this study is limited to one type of academic challenge (motivation challenges) as the outcome and one type of self-regulated learning practices (goal management practices) as the mediator because previous studies have extensively established a relationship between achievement goal orientations and motivational outcomes and Winne and Hadwin's theory (1998) suggested a mediation role of goal management practices in this relationship. Future research should also explore how goal orientations predict challenges in other aspects such as cognition, initiating-sustaining engagement, and social and emotion (e.g., Hadwin et al., 2022b). Theoretically, goal orientations also serve as *conditions* for other phases of studying as SRL such as task understanding (c.f., Winne and Hadwin, 1998). Future research should also investigate how task understanding

practices influence the relationships between achievement goal orientations and academic challenges.

Conclusion

In conclusion, this thesis aimed to examine the relationship between achievement goal orientations and motivation challenges, and whether goal management practices could mediate this relationship through the lens of self-regulated learning. The results showed that mastery-approach goal orientations negatively predicted motivation challenges and goal management practices mediate this relationship. On the other hand, mastery-avoidance, performance-approach, and performance-avoidance goal orientations did not significantly predict motivation challenges. These findings expand the current understanding of goal-related literature by highlighting the beneficial aspects of mastery-approach goal orientations and the mediating role of goal management practices. Further research is needed to shed more light on the complex relationship between achievement goal orientations and other academic challenges such as metacognition, cognition, social and emotion, as well as how other self-regulated learning practices can play a role in the relationship.

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Appendices

Appendix A: Scales

Table A1

Items in the Achievement Goal Questionnaire-Revised (AGQ-R)

Scale	Adapted Item	Original Item
Mastery Approach	This semester my aim is to completely master the material presented in my courses.	My aim is to completely master the material presented in this class.
	I am striving to understand the content of my courses as thoroughly as possible.	I am striving to understand the content of this course as thoroughly as possible.
	My goal is to learn as much as possible this semester.	My goal is to learn as much as possible in this class.
Mastery Avoidance	My aim this semester is to avoid learning less than I possibly could.	My aim is to avoid learning less than I possibly could in this course.
	I am striving to avoid an incomplete understanding of the material in my courses.	I am striving to avoid an incomplete understanding of the course material.

	This semester, my goal is to avoid learning less than it is possible to learn.	My goal is to avoid learning less than it is possible to learn in this class.
Performance Approach	My aim this semester is to perform well relative to other students.	My aim is to perform well relative to other students in this class.
	I am striving to do well compared to other students this semester.	I am striving to do well compared to other students in this course.
	This semester, my goal is to perform better than the other students.	My goal is to perform better than the other students in this class.
Performance Avoidance	My aim is to avoid doing worse than other students this semester.	My aim is to avoid doing worse than other students in this course.
	This semester, I am striving to avoid performing worse than others.	I am striving to avoid performing worse than others in this class.
	My goal this semester is to avoid performing poorly compared to others.	My goal is to avoid performing poorly compared to others in class.

Note. Wordings were adapted to fit in this current study context. "New Item" represents the actual items used in this study while "Original Item" refers to the original items in the AGQ-R.

Table A2

Items in the Goal Management Practices Subscale

Scale	Instruction	Item
Goal Management Practices	Please rate how true each statement is for you. Over the last two weeks, when I did academic work, I...	Set goals for my work.
		Made goals to learn, understand, or remember.
		Set goals that would be useful for checking my progress.
		Identified specific content, ideas, or terms in my goals.
		Assessed my goal attainment.

Table A3

Items in the Motivation Challenges Subscale

Scale	Instruction	Item
Motivation Challenges	The following are the list of things that can make studying and learning at university difficult.	Believing I can do my work
	Think about the past 2 weeks when you rate how true of you each statement was for you. Over the	Feeling like my work was worth doing
		Persisting when things got tough

past two weeks, I struggled with...

Appendix B: Descriptive Statistics for All Items

Table B

Descriptive Statistics for All Items

	Mean	Variance	Standard deviation	Skewness	Kurtosis	Median
MApp1	3.33	0.88	0.94	-0.29	-0.32	3.00
MApp2	3.79	0.75	0.86	-0.60	0.23	4.00
MApp3	3.83	0.63	0.79	-0.48	0.26	4.00
MAvo1	3.10	1.12	1.06	-0.34	-0.59	3.00
MAvo2	3.86	0.50	0.71	-0.83	1.55	4.00
MAvo3	3.01	0.94	0.97	-0.37	-0.46	3.00
PApp1	3.43	0.89	0.94	-0.54	-0.24	4.00
PApp2	3.38	0.94	0.97	-0.31	-0.42	3.00
PApp3	3.07	1.21	1.10	-0.18	-0.69	3.00
PAvo1	3.25	1.18	1.08	-0.25	-0.73	3.00
PAvo2	3.39	1.21	1.10	-0.69	-0.19	4.00
PAvo3	3.39	1.18	1.09	-0.52	-0.55	4.00
GMP1	4.02	0.72	0.85	-0.91	1.16	4.00
GMP2	3.83	0.79	0.89	-0.75	0.52	4.00
GMP3	3.64	0.96	0.98	-0.45	-0.22	4.00
GMP4	3.78	0.77	0.88	-0.56	0.11	4.00
GMP5	3.70	0.88	0.94	-0.63	0.23	4.00
MotC1	2.86	1.12	1.06	0.23	-0.65	3.00
MotC2	2.99	0.97	0.98	-0.01	-0.58	3.00
MotC3	2.76	0.96	0.98	-0.03	-0.49	3.00