

Impact of Social Groups on Academic Agency in Lower-Year and Upper-Year Students

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Abstract

This research paper utilizes principles of symbolic interactionism and social psychology to explore elements of academic agency and group membership in undergraduate students. By employing a survey and analyzing data points, our research reinforces that group membership is correlated with academic agency. Academic agency was measured by taking scores of individual self-efficacy, forethought, self-reflectiveness, and performance. We found a variety of differences in these measures when we divided our sample into definable groups based on group membership orientation. Most notably, large differences appeared between group membership orientations and self-reported scores for self-efficacy. We conclude that group membership has an influence on academic agency, and that self-efficacy appears to be the most distinguishing factor between differing groups.

Introduction

Transitioning from secondary to tertiary education is a challenge that a plethora of students must learn to adapt and navigate. Given the number of shifts that typically occur for students during this transitional phase, it is crucial to understand how student academic agency is impacted over the course of their undergraduate career and how salient social groups play a role in this process. Academic agency is a core life principle that penetrates all aspects of a student's academic career and is understood as the capacity to make intentional choices to alter the course of one's learning (Jääskelä et al., 2020). Although it presents itself as a salient concept in the field of social sciences, psychology, and social psychology, agency remains empirically neglected. Academic agency is exercised more when students believe in their own efficacy and abilities to perform the desired outcome, which is strengthened by familiarity with the system and curriculum (Bandura, 2006). The student's year of study may expose patterns of academic agency over the course of undergraduate students' careers, displaying stronger agency over the years. On the contrary, analysis of students' most influential and salient groups will expose the impact that group orientation and the internalization of surroundings may have on the academic agency of the student. In all, this research aims to bridge the current gap in literature and empirically ground the construct of academic agency in hopes of deepening the understanding of students' lived experiences and unconscious patterns.

Paper Outline

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The following paper is divided into six main sections. To begin, we explored theoretical frameworks that relate to group membership and academic agency. In this review, we identified that symbolic interactionism and social cognitive theory were appropriate conceptual models to interpret our research. In utilizing the framework of social cognitive theory, Bandura's (2006) Triadic Reciprocal Model helped to structure our conceptualization of agency and group membership. Next, we conducted a literature review where we evaluated historical and contemporary resources in our area of interest. In the literature review, we define our major terms regarding group membership and the operationalization of academic agency. Following the literature review, we outline our methodologies for our research. In this section, we include details regarding our research design, ethical considerations, foreseeable challenges, plans for data analysis, and the timeline for the research process. After outlining our various methodologies, our next major section summarizes the findings of our research. In this section, we illustrate various tests and forms of data analyses to show the relationship between the variables in our study. Continuing, the second to last section of our paper breaks down the findings of our research with a discussion. Our discussion section is divided into three subsections based on our variables of interest, here we talk about what our main findings mean, how they relate to other literature, and how they relate to our theoretical frameworks. In the end, our last section talks about limitations and significant insights, here we conclude that group orientation has a noteworthy influence on academic agency.

Theoretical Frameworks

Symbolic Interactionism

Symbolic interactionism is a social psychological theory that emphasizes the importance of human interaction and communication in the creation of shared meanings and social structures (Blumer, 1986). George Herbert Mead is considered the originator of the symbolic interactionist approach, but it was Herbert Blumer who developed and established the theory. Blumer's work established the three main premises of symbolic interactionism. The first premise posits that individuals' actions towards things are based on the meanings that those things hold for them (Blumer, 1986). This includes physical objects, other people, institutions, morals and beliefs, and everyday interactions. The second premise argues that the meanings of these things are derived from the social interactions that an individual encounters with others. Lastly, the third premise holds that these meanings are continuously altered through an interpretive process (Blumer, 1986).

Symbolic interactionism holds the position that the meanings created by individuals are central and formed while interacting with others (Blumer, 1986). Meanings are not static and are constantly adapting due to the social nature of the world. Blumer (1986) identifies the basic ideas of symbolic interactionism as root images, which include societies, objects, the individual as an actor, social interactions, human action, and the interrelatedness of the lines of human action. When examined collectively, these root images embody the method in which the symbolic interactionist theory regards society and human conduct (Blumer, 1986).

Mead (1934) recognized that the experience and behaviour of an individual are strongly influenced by the social group to which they belong. The "self" is therefore a social product that is developed through the human experience (Mead, 1934). Society is defined as a community of individuals interacting with one another, and symbolic

interactionism acknowledges the crucial importance of social interaction in the formation of human conduct and agency (Blumer, 1986). This theoretical framework will be crucial in explaining how group orientation may influence patterns of academic agency in our study. The group one is mostly around defines what certain aspects in their life mean and the importance they hold.

Social Cognitive Theory

Social cognitive theory (SCT), developed by Albert Bandura (2006), expands upon the foundational principles of symbolic interactionism to explore the evolution of human agency over the course of an individual's lifespan. SCT posits that an individual's cognitive processes are shaped by their interactions with the world, which are comprised of internal and external factors that are deeply intertwined within society. Bandura (2006) stated that occupational goals, family influences, successful performance in school, and social relationships all have lasting effects on an individual. These life influences shape the trajectories and future aspirations of individuals.

Importantly, SCT and Bandura (2006) highlight that human agency is dependent on social structures. Not only are people surrounded by social structures, but they are also created as a result of activity within society and therefore hold significance to the individual. Bandura (2006) further posits that there is a strong relationship between self-efficacy, which refers to an individual's belief in their ability to accomplish a specific task or goal, and both the family unit and education. In terms of the family, the shared understanding of how processes are worked through, and decisions are made, can shape an individual's efficacy within themselves. In modern educational environments, students are given more control over their own learning experience, and thus become agents of their own learning rather than simply recipients of information from the education system (Bandura, 2006). These factors impact the formation of a person's ability to build social relations, academic and career development, and structures emotional well-being.

SCT differentiates three modes of agency rooted in a person's belief in the power they have to control their life trajectories through their own actions: personal agency, proxy agency, and collective agency (Bandura, 2006). To begin, personal agency is exercised independently and is rooted in the notion that human beings feel the need to hold authority over most of the situations they encounter (Bandura, 2006). Proxy agency, on the other hand, depends on social efficacy to enlist the help of others, and is often used to seek security, well-being, and desired outcomes (Bandura, 2006). Finally, collective agency refers to the human need for collaboration with others, where exchanges of resources, skills, and knowledge, as well as mutual support and alliances, can assist individuals in achieving what they may not be able to accomplish alone (Bandura, 2006). Social systems and interactions with others are the experiences that human beings are grounded in, without them there would be a severe lack of individual opportunity.

Overall, SCT provides a comprehensive framework for exploring the complex and nuanced interplay between individual agency and social structures, which can be further utilized to understand academic agency in relation to group orientation. Through recognizing the importance of social structures and their influence on an individual's efficacy, aspirations, and development, SCT posits that individuals can exercise agency through individual, proxy, and collective modes. This theory will ground our research and will be utilized to analyze how academic agency is impacted by social relationships.

Bandura's Triadic Reciprocal Model

Bandura's Triadic Reciprocal Determinism (TRD) model is a key component of SCT and expands on the concept of agency. The model highlights the reciprocal relationship between an individual's behaviour, cognitive factors, and the environment (Bandura, 1986). In other words, an individual's behaviour is shaped by both their internal thoughts and beliefs, as well as their external environment, which includes social and cultural factors. These factors, in turn, are shaped by an individual's behaviour and cognitive processes (Bandura, 1986).

The TRD model provides important implications for understanding and bridging academic agency and group orientation. For example, an individual's belief in their ability to succeed academically, which is self-efficacy, can be influenced by their personal experiences and their social environment (Bandura, 1986). Additionally, the TRD model suggests that individuals can actively shape their environment through their behaviour and cognitive processes. This is particularly relevant in the context of academic agency, as students can actively seek out resources and support systems that will enhance their academic success (Bandura, 1986). Moreover, Bandura's model also highlights the importance of social modeling, where individuals learn through observation and imitation of others' behaviour, which can impact their beliefs, attitudes, and ultimately their behaviour (Bandura, 1986).

As with SCT, Bandura's TRD model provides a valuable framework for understanding the relationship between an individual's behaviour cognitive processes, environment, and how these factors impact academic agency. By considering the reciprocal relationship between these factors, we can gain a deeper understanding of the factors that influence academic agency and develop strategies to enhance it.

Statement of The Problem and Purpose of Research

An overwhelming amount of existing social psychological literature analyzes concepts of human agency and group membership. Although both concepts are heavily covered, their amalgamation and usage in academic settings to measure agency remains uncovered territory. Within this research, we contest that group memberships play an influential role in shaping individual behaviours. Historically, social psychologists have posited many different ideas concerning the root of individual behaviour, particularly in relation to external relationships, including ideas ranging from Mead, Merton, Cooley, Sherif, and Bandura (Forsyth, 2018). Our research, more specifically, focuses on how group memberships influence academic agency. While there is rich literature in topics on agency and group membership, extraordinarily little research applies theory to the influence of groups on student agency as it relates to academics. Utilizing social psychological frameworks, our research uses quantitative methods to assess how strong group identities influence individual behaviours on an academic level. Broadly speaking, research focusing on this topic is extremely limited and we hope to contribute to this gap in social psychological research.

Literature Review

Although the concept of agency has widely penetrated academic literature in the past half a century, a measurement of academic agency has yet to reach a comprehensive conception. This literature review aims to bridge various conceptual frameworks and provide a metric for analyzing academic agency using a multidimensional approach. By

drawing on a range of empirical studies and theoretical perspectives, we identify key factors that may contribute to academic agency, and to provide a more nuanced understanding of the ways in which this construct is manifested in practice. Ultimately, we aim to contribute to a more comprehensive understanding of group orientation in relation to academic agency in university students and its potential implications for student success.

Agency and Efficacy

The historical progression of academic agency, also referred to as student agency, as a metric in the field of social sciences does not date back exceedingly long. This observation is supported by a study conducted in Finland by Jääskelä and colleagues (2020) that developed the first validated instrument to collect student agency in higher education. The Assessing Agency of University Students (ASU) scale was utilized in the data collection of over 250 Finnish university students with a mean age of 22.6 years. The overarching goal for their data analysis was to utilize the validated instrument and provide student agency analytics in pursuit of improving academic advising and knowledge regarding enhancing pedagogy (Jääskelä et al., 2020). Due to the desired outcome of the study, the domains captured to assess agency were based on personal, relational, and participatory resources, all of which provide insight into the impact of perceived access to resources on academic agency. Albeit rich in information, the given study fails to inquire about respondents' salient social groups and account for their impact on academic agency, which highlights an unexplored, yet important concept.

Self-efficacy, a component of the personal resource's domain used above, refers to the confidence in oneself to succeed and was adopted as one of the measures in our study to assess academic agency (Cavazzoni, 2022). Based on present literature we assert that elevated levels of perceived self-efficacy in students is correlated with higher levels of academic agency and performance (Hayat et al., 2020). Considering this fact, it would be interesting to uncover how students with various levels of self-efficacy are impacted by strong social connections that share a common belief. Through our research, we hope to expand current findings and gauge the impact that levels of self-efficacy have on academic agency in the presence of differing group orientation styles.

Group Identification

Agency in the field of social psychology is defined by the capacity to engage in meaningful, voluntary, self-defined, and autonomous actions in events influenced by power (Jääskelä et al., 2020). To elaborate on the given definition and further explore social influences on student agency, a social cognitive theoretical perspective was used to ground our survey. Social Cognitive Theory (SCT) posits that individuals are agentic shapers of events; however, it extends the concept of agency to group dynamics and collective agency (Schunk & Usher, 2019). The emphasis on the role social environment plays on motivation and self-regulation further affirms the necessity of analyzing academic agency in conjunction with social environment (Schunk & DiBenedetto, 2019). The social environments of undergraduate students could increase motivational outcomes through upward social comparisons, modelling, and shared collective efficacy (Donohoo & Hattie, 2018). On the contrary, some environments, especially if student possess low self-efficacy, may enable individuals from exercising full academic agency due to opposing group intentions, social modelling, and more.

Mead's concepts of primary and reference groups are relevant to the development of academic agency in students. Students who have strong connections to primary groups are more likely to feel a sense of belonging and are more likely to be motivated to succeed academically. Students who identify with positive reference groups are more likely to have positive academic outcomes and are more likely to see themselves as capable learners (Donohoo & Hattie, 2018).

Empirically grounding elements related to shared group efficacy, strength of relationship, and frequency of exposure will allow us to determine the groups in which they model and internalize.

Reciprocal Determinism

SCT provides an extension to personal agency by addressing environmental and behavioural components and processes. Although current literature is flooded with agentic properties of SCT, it fails to include the model in the assessment of academic agency of students in different environments. The current research aims to build on SCT's analytical model, Triadic Reciprocal Determinism (TRD), and utilize it in representing bidirectional relationships between personal, environmental, and behavioural factors (Schiavo et al., 2018). Simply put, the model suggests that individuals' thoughts impact their actions and environment, the actions in turn influence their thoughts and environment, the environment in turn influences their thoughts and actions. Similar to Jääskelä and colleagues' research (2020), personal processes will be evaluated by students perceived self-efficacy, environmental processes will be evaluated by 3 metrics related to social relationships, and finally behavioural processes will be evaluated by academic agency. This model ties into the work of Hayat and colleagues (2020), regarding a reciprocal relationship between high self-efficacy and high performance. Evaluation of each component will be analyzed separately and contrasted based on common themes and findings. Grounding TRD in the study of academic agency allows for a holistic conception of the cyclical and intertwined aspects of human functioning.

Operationalization of Agency

Agency, as a construct, has gained increased attention in recent years. Most commonly, agency refers to an individual's capacity to behave purposely and intentionally to make choices that affect their life. However, despite its importance, operationalizing agency and assessing its impact remains a challenge. This literature review section explores the operationalization of agency, with a particular focus on academic agency. It will examine the shortcomings of existing literature and highlight strategies for measuring and enhancing academic agency as an empirical measure.

One approach to empirically measure agency that has been proposed is to measure domain-specific agency, which involves incorporating general theories of agency into a specific area of interest. Kristiansen (2014) argues that using specific theories to operationalize a narrow domain of agency may have limited effectiveness on literature. Instead, Kristiansen suggests that it is important to focus on overarching factors in individuals' life to assess patterns of agency influences. After reviewing the literature on the operationalization of this concept, our research utilized general yet salient overarching factors in individual's lives to assess factors that influence agency.

Several studies have attempted to operationalize agency in different contexts. For instance, Kuhn and colleagues (2015) developed a questionnaire to measure academic

agency in higher education. Their measure consisted of four subscales: goal setting and planning, academic self-efficacy, study skills, and self-regulation. The authors found that academic agency was positively associated with academic achievement, self-esteem, and well-being (Kuhn et al., 2015). The measures listed were adopted in our research and adjusted in a way to effectively measure our desired variable through our questionnaire.

Overall, the current literature lacks concrete definitions and methodologies regarding an empirical approach to assessing agency, particularly in academic discourse. The transition to post-secondary school presents many challenges, therefore providing tools for self-reflection regarding self-perception, motivation, and behaviour is crucial. The amalgamation of the discussed models and theories is an attempt to address the current shortcoming of current literature regarding academic agency. Understanding intentions and the unconscious processes related can equip students with the knowledge and confidence to navigate internal and external influences in a more conscious and informed manner.

Summary

The literature review provided identifies key factors that contribute to academic agency, including personal, relational, and participatory resources, self-efficacy, and group identification. The review draws on empirical studies and theoretical perspectives to provide a multidimensional approach to analyzing academic agency. The goal of the review is to provide a rich and comprehensive understanding of the current literature on Mead's group orientation in relation to academic agency and its potential implications for student success. Ultimately, the review aims to highlight the research in which a metric for analyzing academic agency that incorporates social, environmental, and behavioural factors was extrapolated. In addition to the metric and theories discussed, we highlight the lack of consensus on a unified definition and measurement of agency and highlights the need for further research in this area.

Research Questions

To evaluate the sample in our study, we constructed research questions to compare students on levels academic agency and group orientation styles. In asking these questions, we wanted to determine whether students exhibited increased academic agency as year of study increased, or if group orientation influenced this process. Survey questions regarding participants' primary social relationships were constructed to determine the strength of these relationships and the frequency of interactions with these groups. Additionally, using our measures for academic agency, we determined participants' level of self-efficacy, forethought, self-reflectiveness, and performance in their academic career. Overall, we were interested in whether decision-making processes are driven by peers and social relations, or are they motivated by a personal desire to achieve academic success. Throughout our research, we focus on the following three questions:

- a. Do students show different patterns regarding group memberships and academic agency by year of study?
- b. Do strong connections with primary groups have specific effects on academic agency?

- c. Is academic agency a concept that can be predicted based on dimensions of group membership?

Methodologies

In the present study, we conducted quantitative research to assess the relationship between group memberships and academic agency. Using a cross-sectional design, the study utilized an anonymous survey to collect data and evaluate our research questions. Our survey was conducted on LimeSurvey, in the format of an online and anonymous questionnaire. The questionnaire asked participants to complete 7 demographic questions and 21 questions designed to provide data for analysis. In this process, we looked to measure participants' self-reported perceptions of group memberships and scores for academic agency, including self-efficacy, forethought, self-reflectiveness, and performance. We assessed the self-reported strength of group memberships as our independent variable, and we assessed self-reported capabilities in enacting academic agency as our dependent variable. Questions in the survey correspond with Likert scales to make assessments of group membership and academic agency quantifiable—this provided opportunities for data analysis. In later stages of data analysis, Jamovi and Microsoft Excel were used to interpret our results and create visual representations of the data. Importantly, LimeSurvey is an approved platform according to the McMaster Research Ethics Board (MREB). This section on methods outlines our research process, ethical considerations, foreseeable challenges, plans for data analysis, and a timeline for the research process. The research was approved by the McMaster Research Ethics Board (MREB#: 0327).

Research Process

The research process began in September 2022 and ended in late March 2023. We formulated our research team in early September and generated research questions pertaining to group membership and academic agency. In September, the research team met once a week to brainstorm theories, methods, and questions that might be relevant to our area of interest. Even though a wide body of literature exists on group membership and agency, academic agency is not well explored in the literature. Given the mass amount of research on agency, the gap in the literature on academic agency puzzled our research team. With this, our research team saw the opportunity to contribute to the literature of academic agency and group memberships. We began the research process with an inquiry into defining academic agency and group memberships and began to research how and why these two concepts might be related. In the initial stages, we hypothesized that students with more group memberships might have decreased academic agency. Moreover, we hypothesized that upper-year students would have higher perceived academic agency than first and second-year students. With further exploration, we figured that specific relationships may have varying impacts on academic agency. This idea was provoked by the differences in conceptualizations by varying theorists, like *reference groups* and *primary groups* (Cooley, 1909 & Merton, 1968). At this point, our research team began to hypothesize that strong ties to primary groups might have different impacts on academic agency than strong ties to reference groups (or secondary groups). These hypotheses guide subsequent evaluations in this study.

Upon setting this foundation for our research, we formulated our survey (see Appendix A – Questionnaire). Along with this phase in our process, we began to identify the

demographics we wanted to assess. Most importantly, we decided to evaluate the influence group memberships had on academic agency. Adding another level to this, we also wanted to see if correlations between group memberships and academic agency varied depending on year of study. We believed that students with a strong primary group orientation would demonstrate different patterns for academic agency than students with a reference group orientation, or no definable orientation at all. With this in mind, we began to design a variety of closed-ended questions assessing the dimensions of group memberships and academic agency. Contributions from Bandura (2006) helped us design questions that evaluated academic agency using core properties of human agency. We utilized Bandura's Triadic Reciprocal Causation model to design questions assessing personal, external, and behavioural factors for agency (2006), these dimensions include forethought, self-reactiveness, and self-reflectiveness.

Next, given its efficiency and inexpensiveness, we gathered participants for our study through convenience sampling. Though this method has limitations, given that the sample has the potential to lack generalizability, this was our best option given our resources. All participants in our sample belonged to the McMaster student body, being 18 years old or older, and were from any program or year of study. Participants for our study were recruited through the McMaster Student Union (MSU) and associated student clubs. With the cooperation of third parties—clubs, committees, and societies—information regarding our study was distributed to potential participants. We reached out to a total of 29 different clubs to recruit enough participants for our study, these groups our listed in our MREB Protocol (see Appendix B – MERB Protocol). On our behalf, these third parties distributed our letter of information (see Appendix C – Letter of Information), and recruitment scripts (see Appendix D – Recruitment Scripts) so potential participants could decide if they would like to participate. After receiving approval from McMaster's Research Ethics Board, our recruitment phase began in November 2022 and ended on February 17th, 2023. This window provided ample time to collect participant data and analyze this data before preparing our research presentation on March 20th, 2023.

Ethical Considerations

As with any research, ethical considerations are of the utmost importance throughout the research process. Before we could complete research involving participants, we had to eliminate all avoidable and potential risks. Firstly, we ensured our research and participant responses were anonymous and confidential. Considering this, all participant data was stored on password-protected devices, the research team used McMaster emails when sharing information, and participants remained anonymous throughout the whole research process. With the completion of our research, all saved participant data will be deleted in April 2023. Importantly, our research posed no risks greater than those in everyday life.

Adding to considerations of anonymity and confidentiality, psychological and social risks exist in this study. Due to the nature of the research topic, our research forced participants to be introspective and look within. This could cause psychological distress by invoking unpleasant feelings or triggering negative thoughts. With this in mind, we did not expect our questions to make anyone feel psychologically distressed, given we are not assessing a sensitive topic. The psychological risks associated with our study were worth considering throughout the research process because they could have violated ethics protocols, skewed our data, and caused reductions in participation. All of which

could have diminished the integrity of the study. For example, if some questions were too personal, there could have been a lack of responses for this question—leading to holes in data and conclusions. With these considerations in mind, the questions designed for this study did not expose participants to any more risk than what they already experienced in their day-to-day life. Questions for our research did not ask more than what was required for data analysis. Adding to our list of precautions, all participants were reminded that they could stop the survey at any time if they felt uncomfortable during the survey. There was zero obligation to complete the survey once it commenced. Participants could skip any of the questions while completing the survey. The only question some participants skipped was when we asked for their gender, which was also the only open response question in our questionnaire. Lastly, information for support and resources offered by McMaster University was provided to participants through the letter of information, they were also presented on the final page of the survey.

Continuing our discussion on ethical considerations, a social risk that existed in our study was the possibility of compromising participant anonymity due to the online format of our research. This risk existed in two dimensions. First, completing the survey in public places represents a potential risk to the participant's privacy. To eliminate this social risk, we ensured that participants were aware they could pause and resume the survey at any time to move to comfortable or private locations. It was recommended that the survey be completed in a secluded location so all participants could be reassured that nobody could view the information on their computer screens. The second social risk regarded the security of their survey responses and the survey platform. LimeSurvey is an approved and secure platform according to the MREB. All participant information was protected from external third parties, and after April 2023, all participant information will be deleted. Even though our research team had access to participant data, survey responses remained completely confidential throughout the entire research process. While psychological and social risks comprise the bulk of our ethical considerations, conflicts of interest represent another dimension of ethics worth debriefing.

Being McMaster students, additional ethical considerations were required due to conflicts of interest. Firstly, five of our six researchers were Teaching Assistants for the university throughout the course of our research. As a result of the multiple roles on campus that our team had, researchers who were not Teaching Assistants at the time of recruitment oversaw recruitment and reaching out to MSU and student bodies. This precaution reduced the overall risk that anyone associated with the research team would impact the study. In addition to this concern, it is important to note that we had something to gain from this research. In completing this research, our research team completes a mandatory program requirement. This means conflicts of interest existed and we had to be careful as researchers not to manipulate any data to support hypotheses. These conflicts of interest reminded our research team to remain impartial and objective throughout the research process. These points cover our ethical considerations, bringing us to foreseeable challenges.

Foreseeable Challenges

This section identifies foreseeable challenges in our research and the steps we took to ensure our research was valid and reliable. To begin, our research focused on student self-reports for group membership and academic agency. Self-reports can pose an issue,

as it may be difficult for students to accurately account for the effects of social influences on their own agency. As a result, questions evaluating our variables required some level of introspection, and therefore, social desirability bias represents one potential challenge in data collection and analysis. Based on the intent of our research, participants may have felt pressured in their responses to not become statistical outliers. Given we were assessing group memberships and academic agency, it is possible that participants could fabricate answers to give the impression they have many group memberships, or to give the impression they are a good student. It was paramount to us to reduce social desirability bias to collect as much authentic data as possible. To mitigate the effect of these challenges, participants were reminded to answer questions honestly by selecting the most appropriate answer for each question. Additionally, we worded questions to reduce social desirability bias and promote honest answers. Moreover, we ensured participants were aware that their survey responses were anonymous and private—encouraging participants to complete the survey with authenticity.

Adding to social desirability bias, there is a large gap in the research pertaining to our topic. There is plenty of research on group membership, group dynamics, and agency; however, little research assesses academic agency in post-secondary students. Due to the lack of research in our topic area, there is little guidance to our research and little existing research to compare our data against. For instance, previously written literature reflects that there is not one distinct definition of how academic agency is measured (Cavazzoni et al., 2022). The absence of direction from previous literature allows many interpretations as to how academic agency should be measured. Past studies have involved interviews and assessed classroom situations to monitor personal autonomy (Cavazzoni et al., 2022). Rather, our research utilizes an anonymous survey to understand the self-reported effect of social relationships on academic agency. Due to this challenge, we had a tricky time comparing our data to similar studies pertaining to group memberships and academic agency. In executing data collection and analysis, referencing a similar study on academic agency would be beneficial to establish concurrent validity.

Beyond these points, several foreseeable challenges were a result of recruiting participants through convenience sampling. Firstly, one of our research questions inquires whether students demonstrate different patterns between group membership and academic agency based on year of study. To answer this question, we required an appropriate number of responses from students in different years of study. This represented a potential challenge for data collection and analysis, especially given that we expected more lower-year students to complete our survey than upper-year students. To account for this challenge, we recruited from clubs with many upper-year students. With a relatively even distribution of upper and lower-year students in our sample, we could provide a better analysis of this research question. We felt like this challenge nearly required a semi-quasi-research design, where our research team would ensure that our sample represented necessary demographics (first year to fourth-year students). Adding to the challenges surrounding convenience sampling, we worried our sample may not end up being representative. Given our focus on year of study and group orientation, we excluded demographic questions pertaining to culture or ethnicity. While this posed no challenges for data collection, data analysis may have been more generalizable if we

could have ensured a representative sample along variables for culture, gender, and other demographic variables.

Data Analysis

Following the completion of data collection on February 17th, 2023, we used Microsoft Excel and Jamovi to conduct our data analysis. Using Jamovi provided an opportunity to perform statistical analyses on the data, lead points of discussion, and drive conclusions toward our research questions. We used Jamovi to derive descriptive statistics, correlation matrices, linear regressions, One-Way ANOVA tests, and Multinomial Logistic Regressions. Additionally, we used Microsoft Excel to create pie graphs and bar graphs to simplify some of Jamovi's visual representations. By creating visual data, we made our research more comprehensible for any audience. Given our time constraints, we had approximately 45 days to analyze the data and form our final thesis.

To synthesize the sample's data, we had to numerically code responses as ordinal integers to assist in conducting descriptive analyses, which correlated to Likert scales. Given we were measuring two main variables (group membership and academic agency), a multi-indicator analysis was employed, with several indicators measuring our variables of interest. The overarching model utilized, the Triadic Reciprocal Determinism model, assessed the individual on a personal level through the evaluation of self-efficacy related to academics. Additionally, it was used to assess individual personal environments by collecting information about primary and reference groups (Bandura, 2006). Importantly, we adopted this model to evaluate behavioural outcomes related to academic agency. According to Bandura (2006), personal, behavioural, and external factors all mutually influence each other and produce different outcomes related to agency. When we analyzed the data, we used this as our conceptual framework.

Adding to this discussion, we designed 9 questions to assess the strength and salience of various groups (6 questions for primary groups and 3 for reference groups). When looking at primary groups, we evaluated relationships between family and friends, and when looking at reference groups we analyzed other group memberships (social clubs, sports teams, colleagues, etc.). This perspective gave us an idea of the types of groups participants belonged to and the influence these groups might have on their academic agency. Furthermore, we designed questions to assess academic agency through (1) forethought, (2) self-reflectiveness, and (3) performance. These measures have been used in previous research to assess individual agency (Schiavo et al., 2018). To derive statistics from this data, we exported all participant responses from LimeSurvey into a CSV (Comma-Separated Value) file to import them into Jamovi. This process ensured compatibility between softwares. Both demographic and experimental variables were formatted into these formats for analysis. Upon exporting the data, we evaluated demographics with patterns related to group membership and academic agency. From here we began to draw conclusions and create points of discussion.

Timeline of Data Collection and Analysis

Date	Data Collect and Analysis Responsibilities	Due Dates
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October 2022	<ul style="list-style-type: none"> - Design sampling technique, recruitment scripts, and letter of information to prepare for data collection. - To be completed before Oct. 20th, 2023 	Research proposal due Oct. 20 th
November 2022	<ul style="list-style-type: none"> - Begin participant recruitment and data collection process once approval has been granted - Reach out to MSU and associated student clubs once approval has been granted - Survey must be made available for LimeSurvey once approval has been granted - Begin preparing for analysis - Text section on analysis prep (reading) 	First round of revisions due Nov. 14 th Overview of research project due Nov. 18 th
December 2022	<ul style="list-style-type: none"> - Continue data collection - Continue to work on revisions 	
January 2023	<ul style="list-style-type: none"> - Continue data collection - Continue to work on revisions 	
February 2023	<ul style="list-style-type: none"> - Data collection ends in mid-February, or when we get 75 participants, whichever happens first - Begin making response data compatible with Jamovi (using CSV) - Export response data to Jamovi for statistical and descriptive analysis - After having analyzed the data, we plan to begin creating our research presentation (giving us approximately 2-3 weeks for data analysis) 	Recruitment finishes February 17 th
March 2023	<ul style="list-style-type: none"> - If necessary, we will complete data analysis in the first week of March. Though we plan to finish analysis in February - Develop conclusions and points of discussion based on the response data - Formulate research presentation (Microsoft Excel for visuals) (due before research paper) - Formulate final research paper 	Poster draft due Mar. 8 th Poster presentation Mar. 20 th
April 2023	<ul style="list-style-type: none"> - Delete participant data - Research process complete 	Final Paper Due April 1 st Delete participant data April 2 nd

Summary

In creating our research design and planning our research process, we considered various ethical considerations and challenges to try and create countermeasures that would optimize our research. We wanted to ensure we could minimize social desirability bias and maximize the amount of authentic data in our study. Throughout the course of our research, we collected survey responses from 74 McMaster University students, all of whom were 18 years of age or older. Our recruitment process began in November 2022 and concluded on February 17th, 2023. Following data collection, we conducted a comprehensive analysis using a variety of statistical measures in Jamovi. This process amounted to several weeks of careful inspection, where we were able to derive significant results. We separated our results and discussion into three main themes based on our findings and key variables of interest; academic agency by year of study, group orientation by year of study, and academic agency split by group orientation. The development of these themes aided us in the process of answering our research questions and systematically presenting our research.

Results

The following graphs, tables, and findings represent the responses from our sample as they relate to our research interests. We evaluated individual responses for self-efficacy, forethought, self-reflectiveness, and performance, to operationalize academic agency. We also evaluated individual responses for group orientation, where participants either met the criteria for primary group orientation, reference group orientation, dual orientation, or definable orientation. The results show primary data collected from ($n = 74$) undergraduate students, 58 were female, 7 were male, and 5 identified as non-binary. We expected most participants to be female; however, we were surprised so few males completed our survey. From the sample, 54.1% of surveyed students lived in an off-campus household with roommates, 28.4% lived in their family's household, and 17.6% lived in a McMaster dorm room; however, this variable was insignificant in our analysis. Our findings are divided into three main sections; academic agency by year, group orientation by year, and academic agency split by group orientation. Before unpacking these findings, we cover proportions for year of study and group orientation and identify correlations between measures for academic agency.

Figure 1 illustrates the distribution of our sample by year of study. Fourth year students made up the largest portion of our sample, with 30 counts, second year students had 19 counts, first year students had 18 counts, and third year students had 8 counts. Separated by lower and upper-year (lower being first and second students and upper being third- and fourth-year students), we had equal halves in our total sample. Both lower- and upper-year had 37 counts. Overall, we were satisfied with our sample distribution by year of study. Worth noting is the small portion of participants who were third-year students.

Figure 2 illustrates the distribution of our sample by group orientation style. Making up the largest group in our sample, 39.2% had no definable group orientation ($n = 29$). 37.8% had a primary group orientation ($n = 28$), 16% had a dual orientation ($n = 12$), and 6.8% had a reference group orientation ($n = 5$). Given our sample size, and such a small number of participants with a reference group orientation, we cannot compare primary group and reference group orientation on measures for academic agency with any certainty.

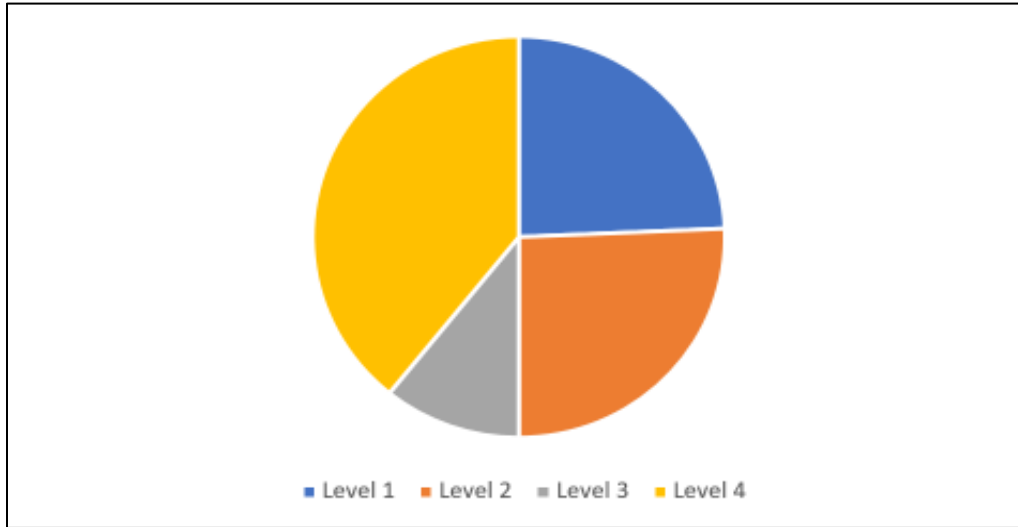
Figure 1*Pie Chart of Level of Study from Students in Sample*

Figure 3 shows a correlation matrix for measures of academic agency, including self-efficacy, forethought, self-reflectiveness, and performance. In all participants, academic agency was relatively high on a scale out of sixty-five (Mean = 50.3, SD = 6.56). Measures for a participant's academic agency were calculated by the sum of scores for self-efficacy, forethought, self-reflectiveness, and performance. As for measures of academic agency, self-reflectiveness was positively correlated with self-efficacy ($r = 0.648$, $p < 0.001$) and forethought ($r = 0.514$, $p < 0.001$). Additionally, forethought and self-efficacy were positively correlated ($r = 0.533$, $p < 0.001$). Performance was not significantly correlated with any measures for academic agency. Interestingly, self-efficacy was negatively correlated with performance ($r = -0.161$, $p = 0.171$). Although this correlation was not strong or statistically significant, we expected to see a positive correlation.

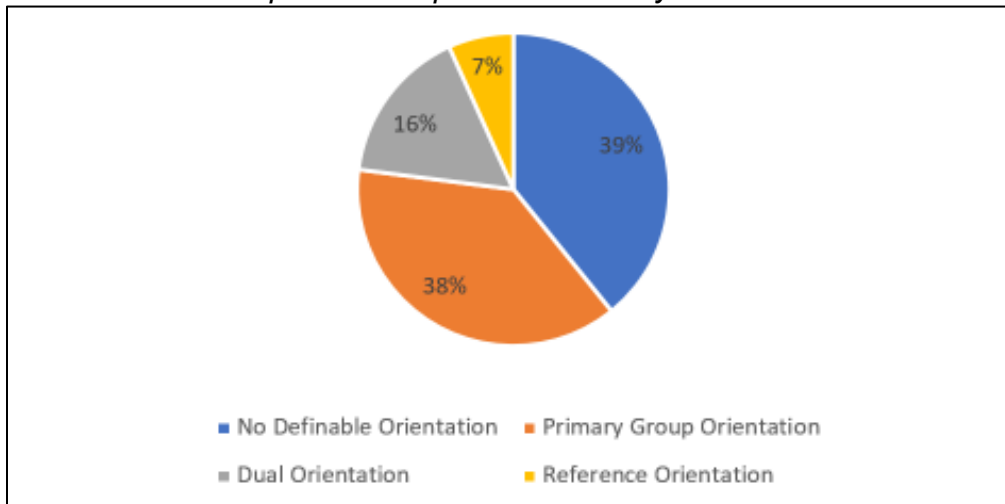
Figure 2*Pie Chart of Participants' Group Orientation Styles*

Figure 3
Correlation Matrix for Measures of Academic Agency

		Self-Efficacy / 20	Self-Reflectiveness / 15	Performance / 15	Forethought / 15
Self-Efficacy / 20	Pearson's r	—			
	p-value	—			
Self-Reflectiveness / 15	Pearson's r	0.648***	—		
	p-value	< .001	—		
Performance / 15	Pearson's r	-0.161	0.139	—	
	p-value	0.171	0.239	—	
Forethought / 15	Pearson's r	0.533***	0.514***	0.119	—
	p-value	< .001	< .001	0.314	—

Academic Agency by Year of Study

We wanted to see how students differed on scores for academic agency based on which year of study they were in. First, we looked at the correlation between academic agency and year of study, then we evaluated measures for self-efficacy, forethought, self-reflectiveness, and performance. Overall, there was a very weak positive correlation between academic agency and year of study, this correlation is not statistically significant ($r = 0.040$, $p = 0.738$). The mean for the whole sample was 50.3, with academic agency being highest in fourth-year students (Mean = 51.1, SD = 6.27) and lowest in third-year students (Mean = 49.0, SD = 4.50). Figure 4 illustrates a linear regression between these two variables, where we see the weak positive correlation. With a confidence ratio of 95%, we can see that there are no statistically significant differences between year of study and academic agency.

Figure 4
Linear Regression Between Academic Agency and Year of Study

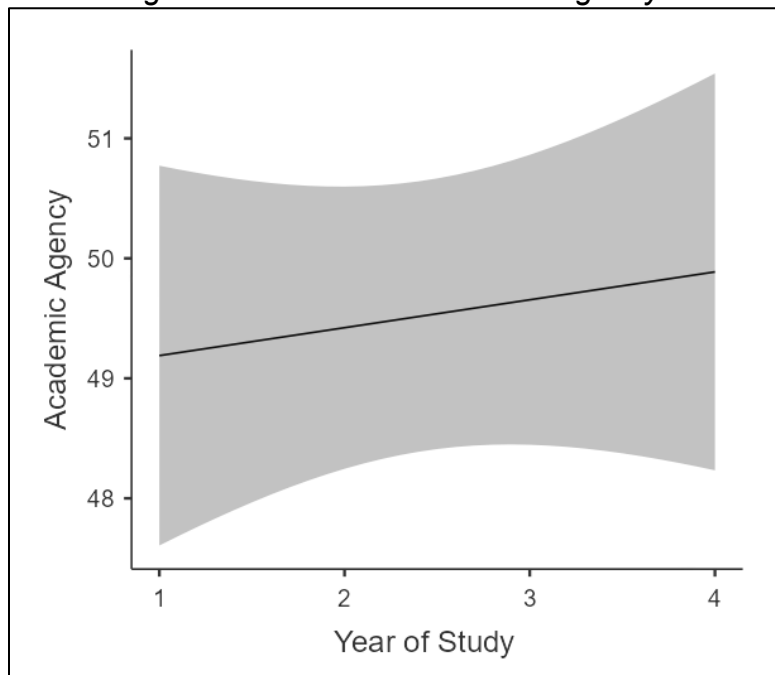
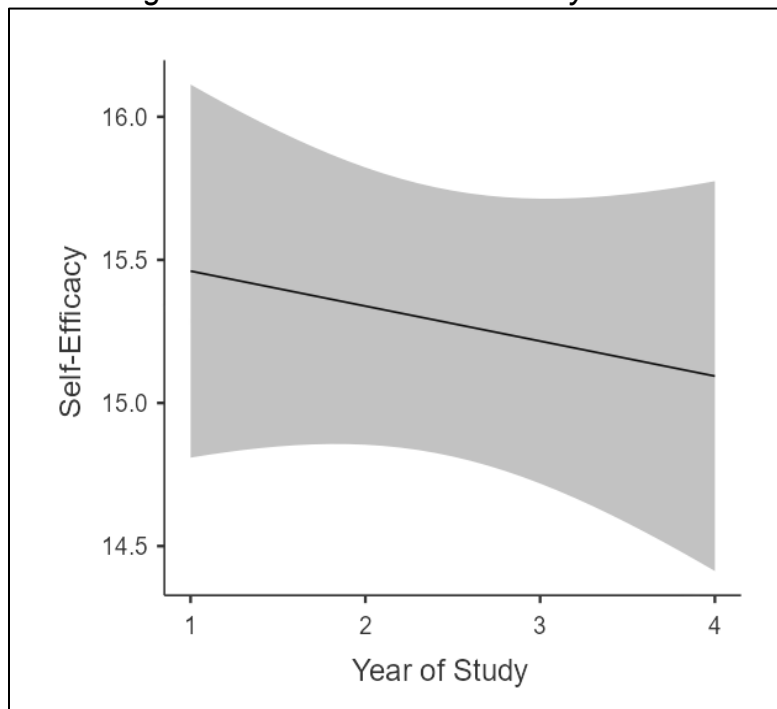


Figure 5 illustrates a linear regression between self-efficacy and year of study. Unlike Figure 4, self-efficacy is negatively correlated with year of study. The mean for self-efficacy for the whole sample was relatively high on a scale out of twenty (Mean = 15.6, SD = 2.77). Self-efficacy was higher in first-year students (Mean = 15.8, SD = 3.76) than in fourth-year students (Mean = 15.4, SD = 2.24). Self-efficacy for third-year students shared the same mean as fourth year students (Mean = 15.4, SD = 2.20). Given the data, there was a weak negative correlation between self-efficacy and year of study; however, it was not statistically significant ($r = -0.059$, $p = 0.620$). With a confidence ratio of 95%, we can see in Figure 5 that this correlation is not statistically significant.

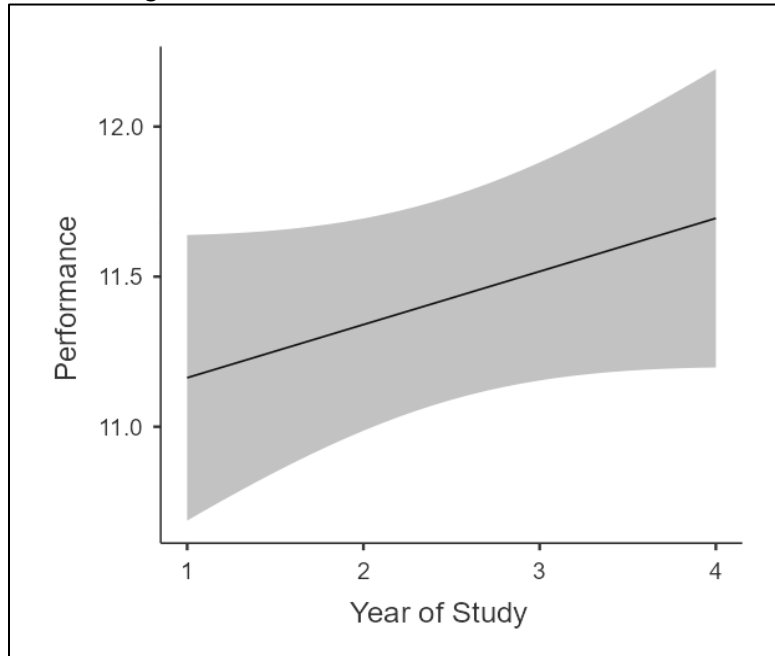
Figure 5

Linear Regression Between Self-Efficacy and Year of Study



Adding to this analysis, academic performance was measured on a scale out of 15 and the sample reported relatively high measures (Mean = 11.5, SD = 1.54). Separated by year of study, fourth-year students reported the highest levels of academic performance (Mean = 11.8, SD = 1.84). Scores for academic performance were lowest in second-year students (Mean = 11.1, SD = 1.10) and first-year students (Mean = 11.4, SD = 1.50). Figure 6 illustrates that performance had a weak positive correlation with year of study, this finding was not statistically significant ($r = -0.135$, $p = 0.252$). Linear regressions for self-reflectiveness and forethought by year of study looked similar in Figure 6.

Like performance, self-reflectiveness was measured on a scale out of 15, and the sample's mean was relatively high (Mean = 11.9, SD = 1.76). By no significant margin, fourth year students rated the highest in self-reflectiveness (Mean = 12.0, SD = 1.71). Self-reflectiveness had a weak positive correlation with year of study, this finding was not statistically significant ($r = 0.037$, $p = 0.755$). Lastly, forethought was also measured on a

Figure 6*Linear Regression Between Performance and Year of Study*

scale out of 15, where the entire sample rated relatively high (Mean = 11.4, SD = 2.99). Separated by year of study, fourth-year students reported the highest levels of forethought (Mean = 11.7, SD = 3.21) and third-year students had the lowest levels of forethought (Mean = 10.4, SD = 1.77). Somewhere between these two measures were second-year students (Mean = 11.3, SD = 2.88) and first-year students (Mean = 11.3, SD = 3.27). Forethought demonstrated a weak positive correlation with year of study, this finding was not statistically significant ($r = 0.050$, $p = 0.672$).

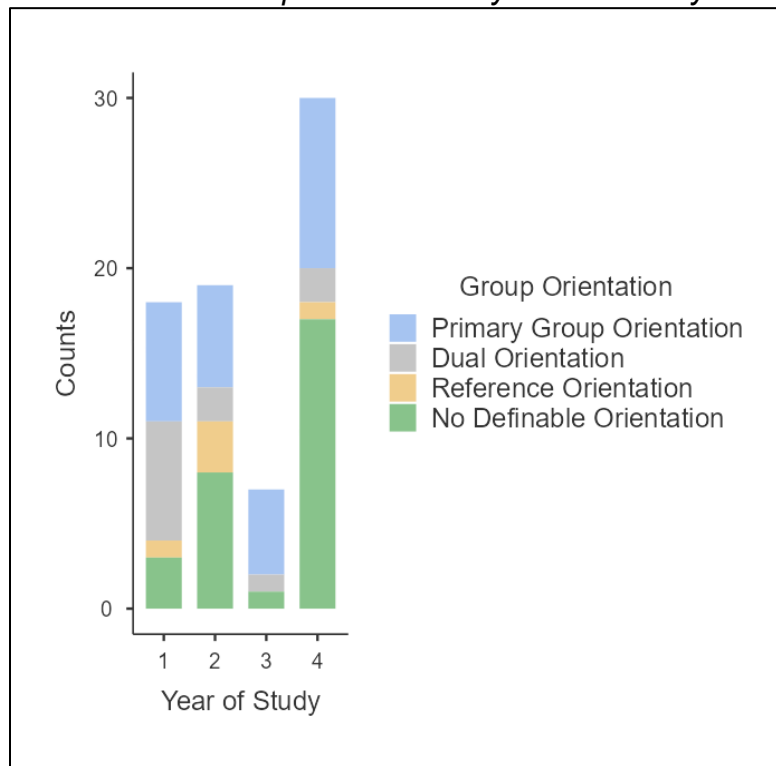
The most significant finding in this section of our analysis is that all measures for academic agency, but one, follow a weak positive trend with year of study. Self-efficacy is the only measure to have a weak negative correlation within measures of academic agency, whereas self-reflectiveness, performance, and forethought all had weak positive correlations with year of study. It is likely that the negative correlation between self-efficacy and year of study is why academic agency was not as positively correlated with year of study as initially hypothesized.

Group Orientation by Year of Study

As mentioned, all participants were sorted into categories for primary group orientation, reference group orientation, dual orientation, and no definable orientation. The largest group in our sample was fourth year students with no definable orientation ($n = 17$), followed by fourth year students with primary group orientation ($n = 10$). Participants met the criteria for primary group orientation if they reported scores for primary group affinity of 16 or higher (this was measured on a scale out of 23). Participants met the criteria for reference group orientation if they reported scores for reference group affinity and scores for reference group affinity of 9 or higher (this was measured on a scale out of 14). Participants who met the criteria for dual orientation met the category requirements for

both primary and reference group orientation. Lastly, participants in the no definable group orientation did not meet the requirements for any orientation in our study. Across all years of study, very few students demonstrated affinity to reference oriented groups, making it difficult to compare this group to others. Figure 7 illustrates the distribution of group orientation by year of study, where the two largest groups in our study were both fourth year students.

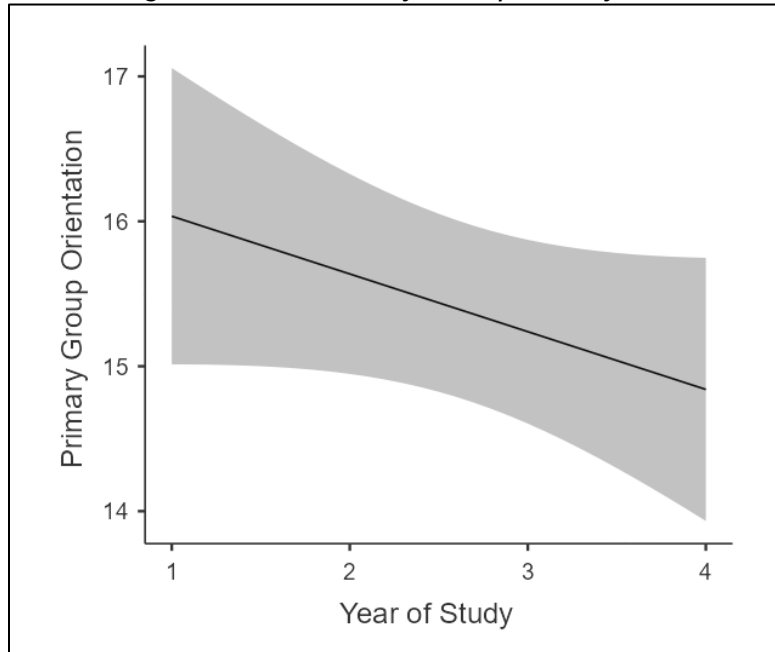
Figure 7
Distribution of Group Orientation by Year of Study



Affinity for primary groups was measured on a scale out of 23 (our benchmark for primary group orientation was 16 or greater). Out of the whole sample, participants reported a mean beneath this threshold (Mean = 15.4, SD = 2.66). Separated by year of study, third-year students show the highest mean scores primary group affinity (Mean = 16.9, SD = 2.64), and second-year students show the lowest level of primary group affinity (Mean = 14.3, SD = 2.69). Overall, there was a weak negative correlation between primary group affinity and year of study, though this finding was not statistically significant ($r = -0.185$, $p = 0.115$) (see Figure 8). Primary groups encompass close relationships with family and friends; therefore, we divided this group into friend and family specific groups to compare with academic agency. There were no significant findings in these subsets, so we removed them from our analysis.

Affinity for reference groups was measured on a scale out of 14 (our benchmark for reference group orientation was 9 or greater). Out of the whole sample, participants reported a mean beneath this threshold (Mean = 7.59, SD = 2.03). Separated by year, first year students reported the highest scores for reference group affinity (Mean = 8.56,

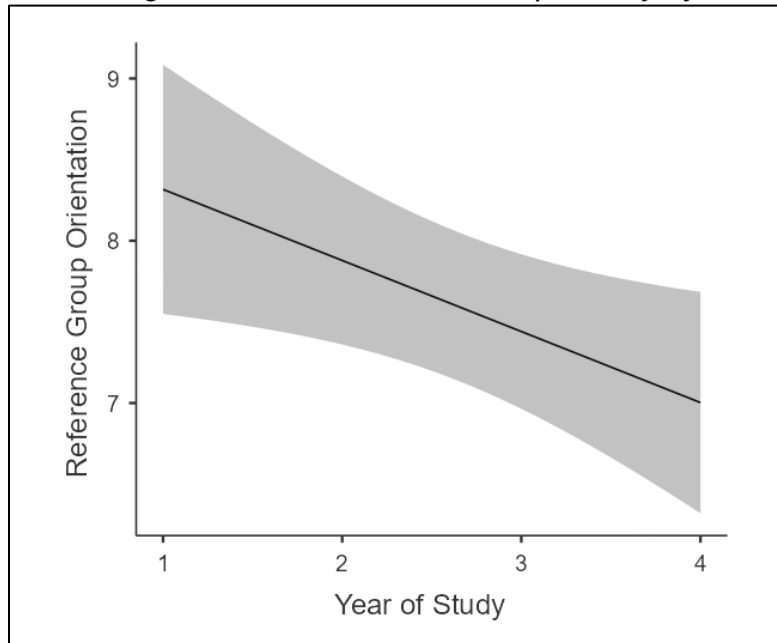
Figure 8
Linear Regression of Primary Group Affinity and Year of Study



SD = 2.33) and fourth year students reported the lowest scores for reference group affinity (Mean = 6.97, SD = 1.74). Overall, there was a weak negative correlation between reference group orientation and year of study, $r = -0.265$, $p = 0.022$ (see Figure 9). This finding was statistically significant.

Many participants in our sample did not meet the criteria for any group orientation, these participants were allocated into our *no definable orientation* group. Fourth-year students notably reported the greatest frequency of orientations that match this description, making up 23% of the sample ($n = 17$). Second-year students had the next highest value ($n = 8$), followed by first-year students ($n = 3$) and third-year students ($n = 1$). We were unable to use linear regressions to illustrate the correlation between this group and year of study, but we were able to use tests of association to compare our sample against an expected normal distribution. In this test we observed a statistically significant p -value for X^2 (chi-squared), $p = 0.022$. This test of significance indicates that our distribution for group orientation by year of study is not normally distributed. We used contingency tables to observe differences in expected counts and observed counts based on these two variables. The most notable difference was that fourth-year students reported a much higher observed frequency than expected frequency for no definable orientation ($17 > 11.76$) (see Figure 10a and Figure 10b).

Importantly, we also accounted for participants with dual orientations. This measure was taken to account for individuals who reported scores past the threshold for both primary and reference group orientation. Participants who reported a dual orientation were not also included in primary or reference-oriented groups. First year students reported the highest frequency of dual orientation, making up 9.5% of our sample ($n = 7$). Dual orientation was reported in fewer frequencies for other groups; fourth-year students

Figure 9*Linear Regression of Reference Group Affinity by Year of Study*

($n = 2$), second-year students ($n = 2$), and third-year students ($n = 1$). Overall, dual orientation had a weak negative correlation with year of study, $r = -0.264$, $p = 0.023$. This was not a surprising finding given that primary and reference groups were both correlated negatively with year of study. Additionally, the dual orientation group demonstrated interesting findings in tests for association using chi squared. First year students reported a greater observed frequency than expected frequency for dual orientation, meaning they disproportionately expressed high affinity for both primary and reference groups compared to other years of study ($7 > 2.92$) (see Figure 10a and Figure 10b).

Figure 10a

Contingency Table for Tests of Association Between Group Orientation and Year of Study – Including X^2 Test.

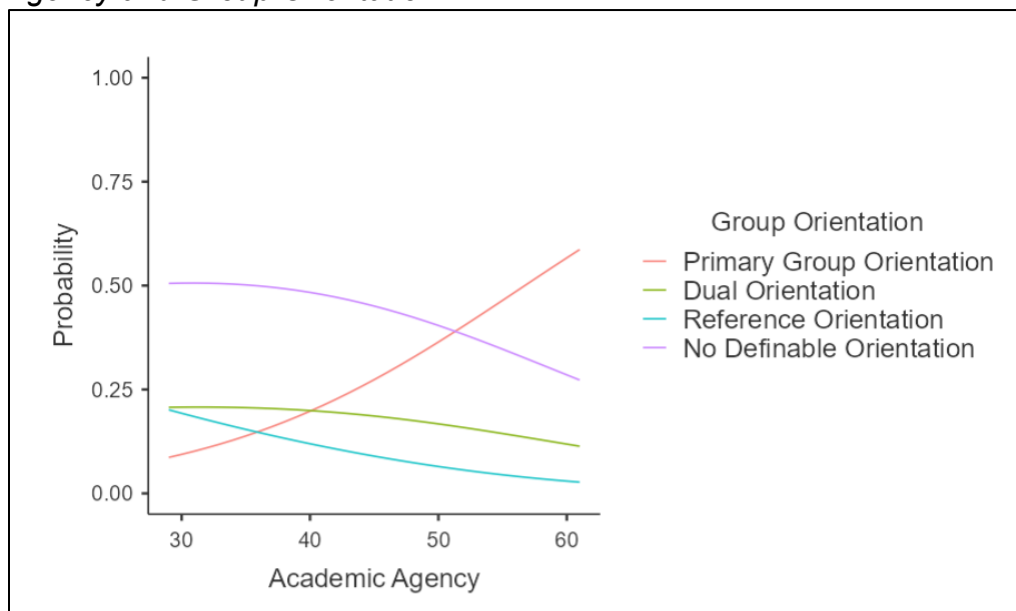
Group Orientation		Year of Study				Total
		1	2	3	4	
Primary Group Orientation	Observed	7	6	5	10	28
	Expected	6.81	7.19	2.649	11.35	28.00
Dual Orientation	Observed	7	2	1	2	12
	Expected	2.92	3.08	1.135	4.86	12.00
Reference Orientation	Observed	1	3	0	1	5
	Expected	1.22	1.28	0.473	2.03	5.00
No Definable Orientation	Observed	3	8	1	17	29
	Expected	7.05	7.45	2.743	11.76	29.00
Total	Observed	18	19	7	30	74
	Expected	18.00	19.00	7.000	30.00	74.00

Figure 10b*Group Orientation and Year of Study Reject the Null Hypothesis*

	Value	df	p
χ^2	19.4	9	0.022
N	74		

Group Orientation and Academic Agency

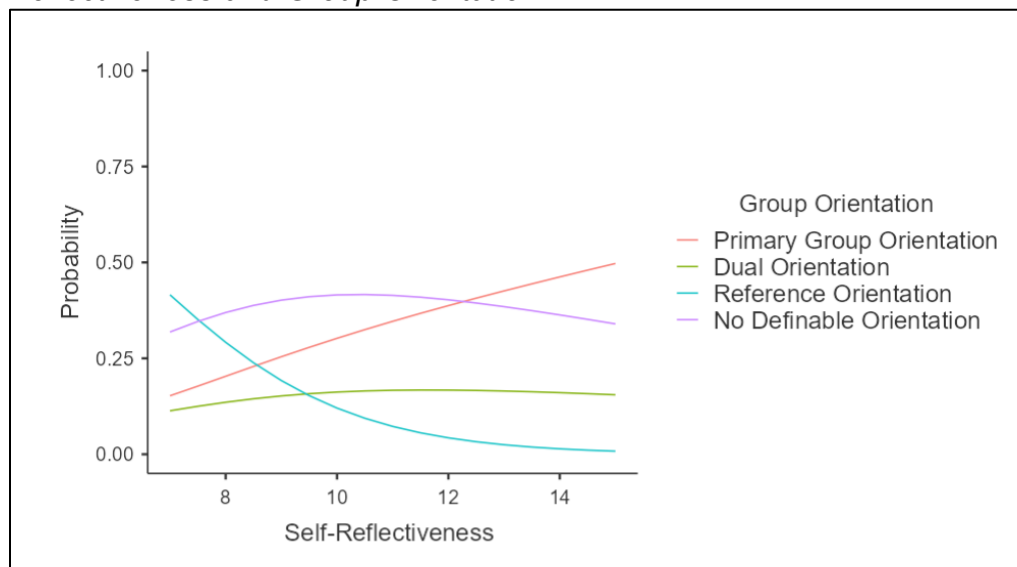
In all participants, academic agency was relatively high on a scale out of sixty-five (Mean = 50.3, SD = 6.56). Academic agency was highest in primary group-oriented students (Mean = 52.3, SD = 5.05) and lowest for reference group-oriented students (Mean = 47.2, SD = 8.41). Levels of academic agency in students with dual orientations (Mean = 49.3, SD = 8.81) and no definable orientation (Mean = 49.3, SD = 6.33) were similar. We used multinomial logistic regression to explore the relationship between group orientation and academic agency. This form of analysis was employed because we wanted to predict the probability of group orientation based on independent variables for academic agency. We identified two interesting findings, though they were not statistically significant. First, individuals in the no definable orientation group were disproportionately more likely to report scores for academic agency one standard deviation below the mean (probability = 46.04%). Second, individuals who reported a primary group orientation were disproportionately more likely to report scores for academic agency one standard deviation above the mean (probability = 50.23%). Figure 11 illustrates a model of estimated marginal means, here we can see how these observations support the idea that group orientation has an influence on academic agency.

Figure 11*Estimated Marginal Means for Multinomial Logistic Regression Between Academic Agency and Group Orientation*

In addition to assessing differences based on academic agency between groups, we also analyzed self-efficacy, forethought, self-reflectiveness, and performance separately. We used multinomial logistic regression to see if groups differed in these independent measures for academic agency. With this analysis we identified a couple differences. Firstly, we noted a statistically significant difference between primary group orientation and reference group orientation on measures for self-reflectiveness, $p = 0.027$. Between these two groups, primary group orientation was likely to report scores one standard deviation above the mean (44.91 %) and reference group orientation was more likely to report scores one standard deviation below the mean. Importantly, we must recall that our group size for reference orientation was exceedingly small ($n = 5$), therefore this could have been more significant. In a larger sample we wonder if we would observe this difference (see Figure 12).

Figure 12

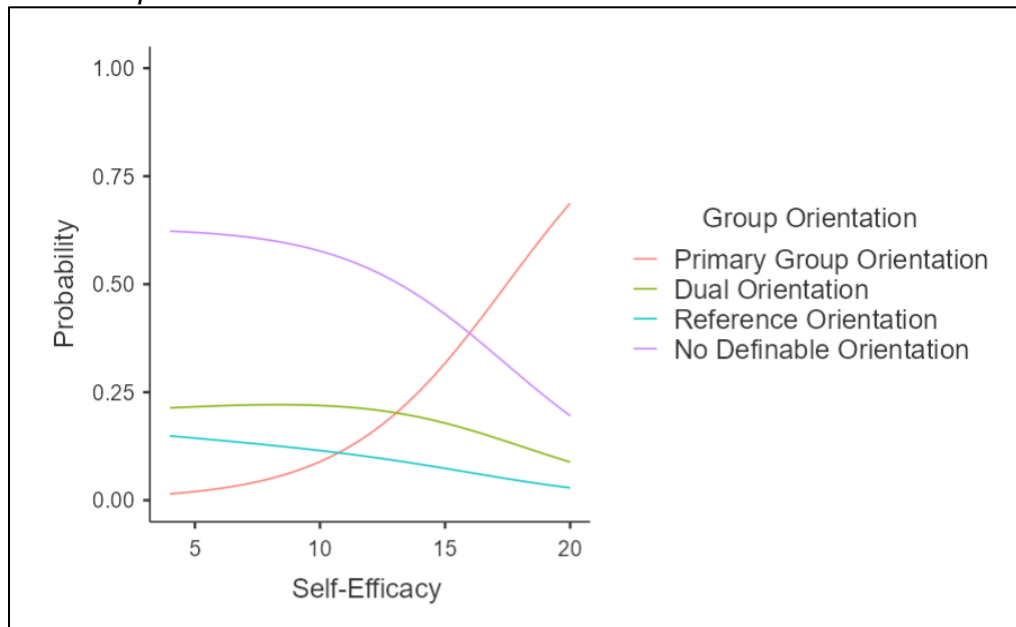
Estimated Marginal Means for Multinomial Logistic Regression Between Self-Reflectiveness and Group Orientation



More significantly, we found considerable differences between group orientations on scores for self-efficacy (see Figure 13). When conducting this analysis, we used primary group orientation as our reference level to see how other groups compared to this one. We noted statistically significant differences in both dual orientation, $p = 0.045$, and no definable orientation, $p = 0.012$, when compared to primary group orientation for self-efficacy. This finding is far more significant than the last one presented on self-reflectiveness because the size of the groups being compared are larger. This finding marks the greatest difference between groups on measures for academic agency in our study. In scores for self-efficacy, the primary group-oriented are disproportionately more likely to report scores one standard deviation above the mean (56.61%). On the other hand, no definable orientation was disproportionately more likely to report scores for self-efficacy one standard deviation below the mean (51.25%). Overall, these finding suggests that primary group-oriented individual's report higher levels of self-efficacy. Figure 13 uses estimated marginal means to illustrate this finding.

Figure 13

Estimated Marginal Means for Multinomial Logistic Regression Between Self-Efficacy and Group Orientation



Adding to Figure 13 and the differences between groups regarding self-efficacy, we used post-hoc and ANOVA tests to compare the means between groups. Notably, there were substantial differences in means on this measure. Between primary group orientation and no definable orientation, we noted a mean difference of 1.817. Between primary group orientation and dual orientation, we noted a mean difference of 1.679, these measures coincide with Figure 13 and Figure 14. As for comparisons to reference group orientation, there was a mean difference of 2.079; however, we have noted the limitations in drawing comparisons with this group in our sample.

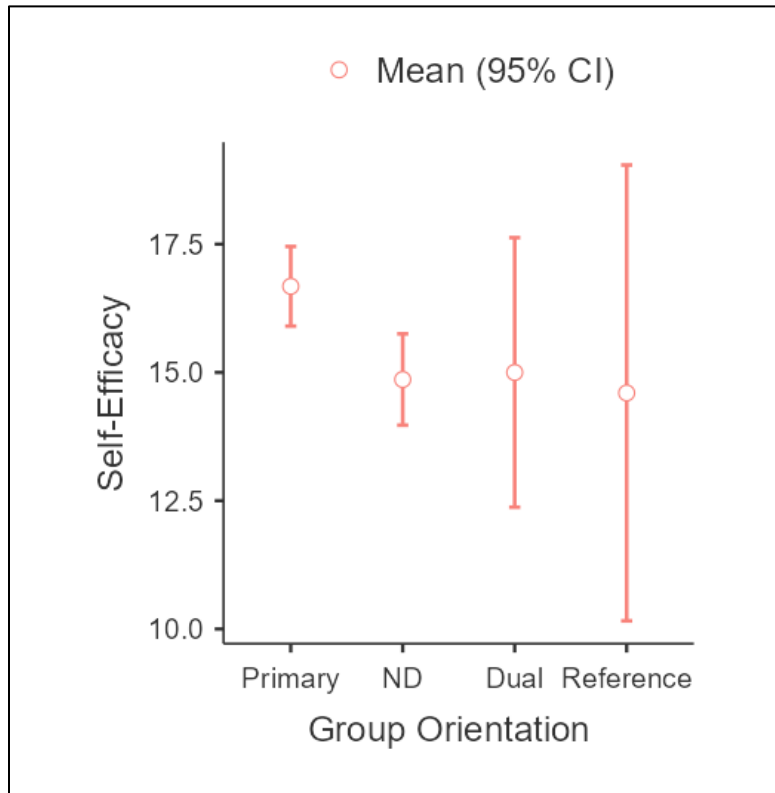
Figure 14 illustrates a plot from a One-Way ANOVA test. In this plot, we can see the 95% confidence ratio for primary group orientation and self-efficacy (15.7–17.7) does not include the mean from the dual oriented group (Mean = 15.0) or the no definable orientation group (Mean = 14.9). Conversely, the 95% confidence ratio for dual orientation (13.5–16.5) and no definable orientation (13.9–15.9) does not include the mean score from the primary oriented group (Mean = 16.7). In this ANOVA test for self-efficacy by group orientation we found that our data rejected the null hypothesis, $p = 0.047$). These findings back up that primary group orientation is statistically significant in its differences with self-efficacy compared to other groups in our study (see Figure 14a and Figure 14b).

To summarize our analysis of academic agency by group orientation, we noticed a slight correlation between primary group orientation and academic agency. Compared to other groups, primary group orientated individuals had the highest probability of reporting scores for academic agency above the mean. This finding was not statistically significant but was an interesting and important part of our analysis. Moreover, we identified a statistically significant difference between primary and reference-oriented groups on scores for self-reflectiveness. While this finding was statistically significant using multinomial logistic regression, $p = 0.027$, this finding is limited by the small number of

Figure 14a

One-Way ANOVA Plot for Self-Efficacy by Group Orientation

ND stands for no definable orientation



participants in our reference-oriented group ($n = 5$). Most importantly, this section of our analysis helped us to identify difference in self-efficacy across groups. We noted statistically significant differences in both dual orientation and no definable orientation when compared to primary group orientation on self-efficacy.

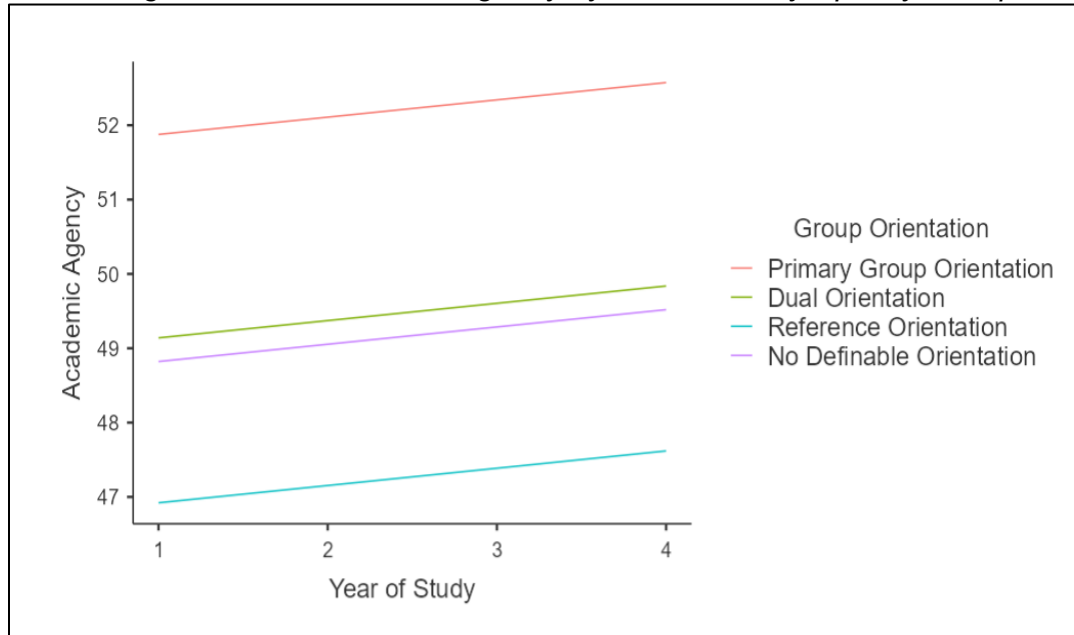
Figure 15 illustrates the differences between groups on scores for academic agency over the years. We wanted to see if groups had different correlations with academic agency over the course of their undergraduate careers. As mentioned previously, academic agency had a weak positive correlation with year of study. All groups in our study follow this weak positive trend. Figure 15 illustrates this correlation, while also making the mean differences for these groups visual.

To get more specific with our analysis, we set up linear regressions correlating year of study with each measure for academic agency (self-efficacy, self-reflectiveness,

Figure 14b

Self-Efficacy and Group Orientation Reject the Null Hypothesis

	F	df1	df2	p
Self-Efficacy	3.38	3	14.8	0.047

Figure 15*Linear Regression of Academic Agency by Year of Study Split by Group Orientation*

forethought, and performance), while simultaneously looking for group differences. We hoped to compare primary group orientation and reference group orientation against each other but with so few participants having a reference group orientation we cannot rely on this group's dataset. As the most significant finding in this process, we found that primary group orientation, no definable orientation, and dual orientation share the same general correlations for measures of academic agency across years of study. Reference group orientation presented itself as an outlier in this process and we wonder how it would have correlated with these measures in a larger dataset (see Figures 16, 17, & 18).

Figure 16 is a scatterplot that illustrates the linear correlation between self-efficacy and year of study, split by group orientation. We can see slight variance within the correlations for independent groups, where reference group orientation was the only group positively correlated. This might be why the 95% confidence ratio in Figure 5 is so large. Again, we see that mean scores for self-efficacy are higher in primary group orientation for all years of study. Primary group orientation, dual orientation, and no definable orientation demonstrated similar correlations.

Figure 17 is a scatterplot that illustrates the slight variance in self-reflectiveness between groups across years of study. As an outlier, reference group orientation was negatively correlated, and dual orientation shows a slightly more positive correlation than the other two groups. Primary group orientation, dual orientation, and no definable orientation demonstrated similar correlations.

Figure 18 illustrates the slight variance in performance between groups across years of study. Again, as an outlier, reference group orientation had a more positive correlation between performance and year of study. Primary group orientation, dual orientation, and no definable orientation demonstrated similar correlations.

To summarize this section of our findings, primary group orientation, dual orientation, and no definable orientation had little variance in their correlations between measures for

Figure 16
Linear Regression for Self-Efficacy by Year of Study—Split by Group Orientation

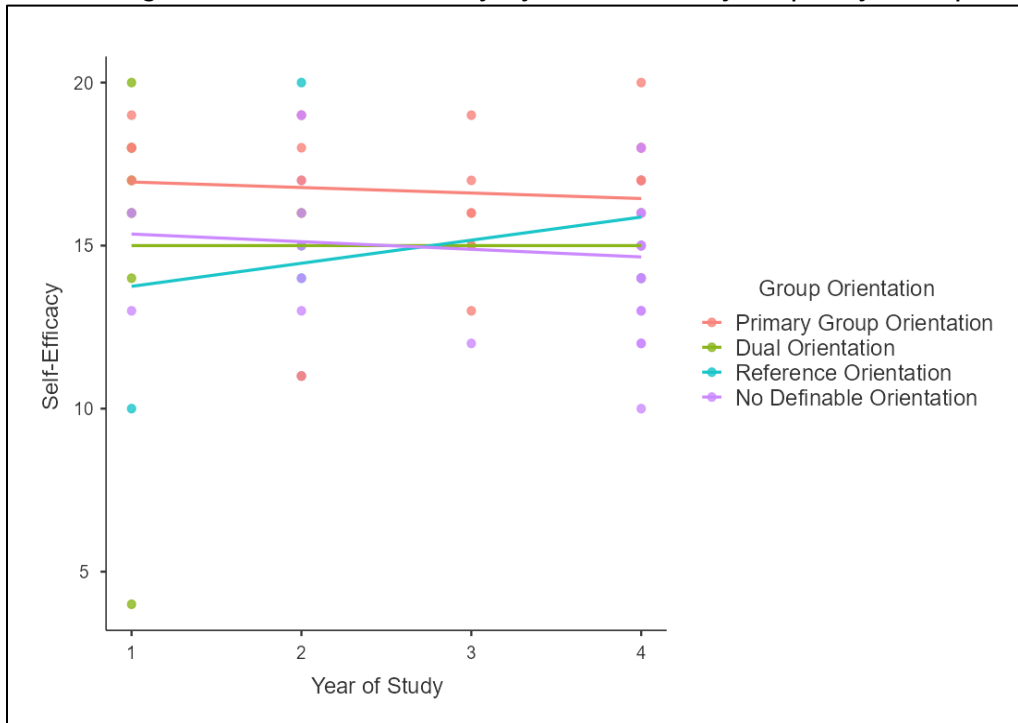


Figure 17
Linear Regression for Self-Reflectiveness by Year of Study—Split by Group Orientation

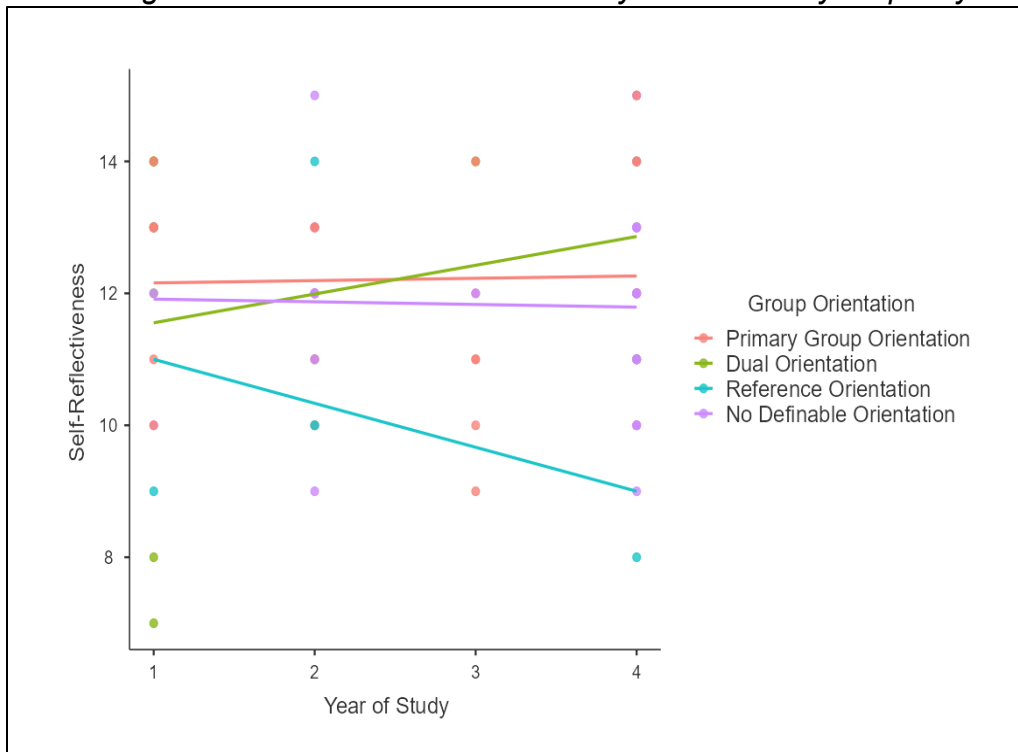
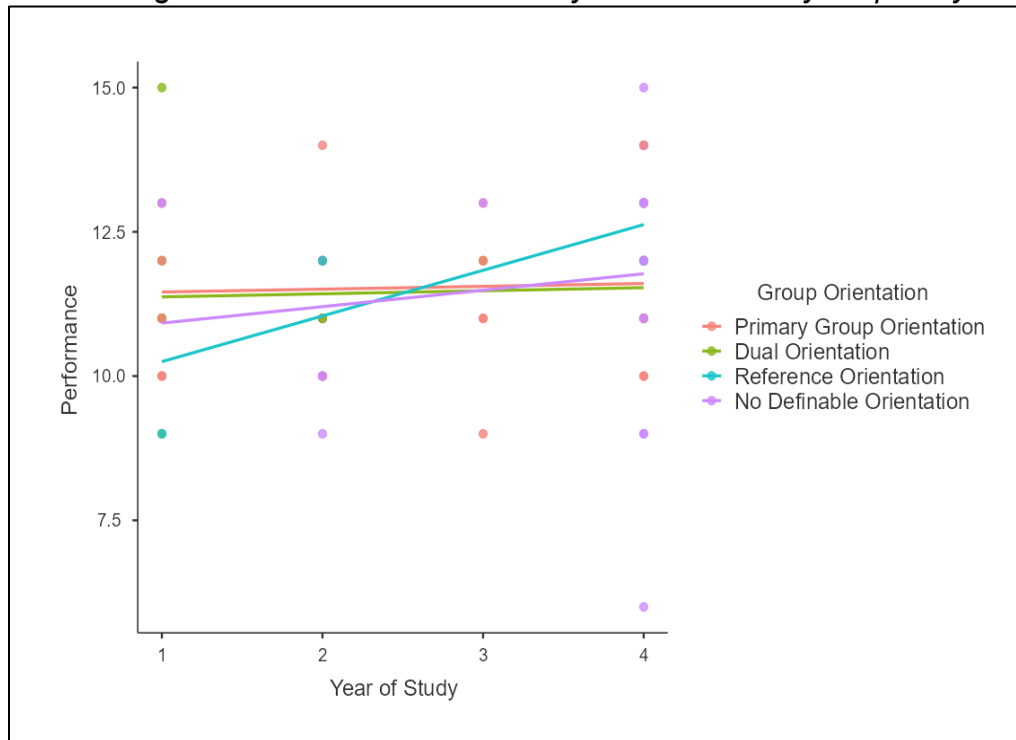


Figure 18*Linear Regression for Performance by Year of Study—Split by Group Orientation*

academic agency across the course of their undergraduate careers. With a greater sample size, it would have been interesting to see if reference group orientation conformed to the patterns of the other groups, or if they would defy the patterns of other groups. With reference group orientation representing itself as a positive outlier in self-efficacy (see Figure 15), we theorized that if we observed the same patterns in a sufficient sample that this difference in self-efficacy might be why we observe a more positive correlation in performance for this group (see Figure 17). We would have liked to see how these variables correlated in a larger sample so we could generalize about the differences between these groups over the course of their undergraduate careers.

Discussion

Academic Agency by Year

Bandura's social cognitive theory (SCT) was the theoretical framework for this area of our research. This theory supports the notion that individuals' cognitive processes can be influenced by different factors presented to them throughout interactions with the world around them (Bandura, 2006). Furthermore, Bandura breaks down these possible influences and states their capabilities of leaving lasting effects on the individual's cognitive processes.

Due to Bandura's theoretical foundation, we hypothesized that academic agency would increase as students' progress through their academic careers. Previous research also supports the notion that higher years of study are correlated with heightened levels of perceived self-efficacy (Hayat et al., 2020). Our findings indicate that this was not the case. We noted a weak negative correlation between self-efficacy and year of study, $r =$

- 0.135, $p = 0.252$. Given the research from Hayat and colleagues, this was not a finding we expected based on previous literature. This negative correlation weakened the correlation between academic agency and year of study overall. With this, our data leads us to conclude that there is no significant correlation between academic agency and year of study, $r = 0.040$, $p = 0.738$) (refer to Figure 4). Within the study, we included four measures of agency (self-efficacy, self-reflectiveness, forethought, and performance). When breaking this down, fourth-year students reported higher scores than first-year students in three of these measures (self-reflectiveness, forethought, and performance). Self-reflectiveness, forethought, and performance all had weak positive correlations with years of study. We can assume that this may be attributed to more experience within the university setting. The higher the year of study, the better students' understanding of what contributed to more success within the post-secondary school system (Cachia et al., 2018). The perception that an individual has on their academic capabilities can depend on their level of achievement (Hayat et al., 2020). We can assume that if a student receives lower marks and experiences difficulties with enrolment in a post-secondary institution, their academic drive may decrease.

In contrast, we observed higher scores in self-efficacy for first-year students compared to fourth-year students (refer to Figure 5). While our study cannot identify the reasoning behind this, we can assume that fourth-year students have more realistic educational goals. By setting realistic expectations for themselves, the individual's perceptions of self-efficacy may shift as a result (Dweck et al., 2014). Research has been conducted to investigate the growth mindset many students possess. Dweck and colleagues (2014) conclude that a heightened perception of an individual's academic ability can be skewed due to non-cognitive factors. Within our study, first-year students are likely to have this growth mindset as they have not yet become accustomed to the nature of the university marking schemes. Students with higher confidence in their academic abilities have a growth mindset (Dweck et al., 2014). Here, their perceptions of intellectual capabilities are centred around high school learning experiences as they have been exposed to less time in a university setting. Additionally, fourth-year students may feel more discouraged due to lower marks throughout their academic careers, which could lead to decreased scores in self-efficacy. The negative correlation between self-efficacy and year of study is why we were not able to identify a positive correlation between academic agency and year of study.

Our research proves significant as research on measures of agency is overall lacking. We found strong, positive, and statistically significant correlations between three out of our four measures of academic agency (self-efficacy, self-reflectiveness, and forethought) (refer to Figure 3). These findings indicate the possibility for our measures of academic agency to hold merit. These measures can be monitored throughout the individual's academic career. While theories suggest agency increases throughout the life course, research has not yet concluded the empirical measures that would encapsulate an individual's overall academic agency. Though our research is not backed up by past literature, it provides insight into the effectiveness of our selected measures of agency. While self-efficacy, self-reflectiveness, forethought, and performance pose the possibility of suggesting an individual's sense of agency, more research must be done to validate these measures as accurate indicators. Research on measures of agency are under studied and, therefore, makes our findings more significant. Our findings can be used as

a starting point for establishing the empirical measures of academic agency that are not present in current literature.

It could be the case that more variables need to be considered when analyzing individual academic agency. It is essential to remember that there are invisible social structures that are influential (Ahearn, 1999). Considering gender, race, and class status may provide insight into the formation of academic agency within an individual. Our study did not hold the capacity to assess these social influences, therefore further research can be designed to suit these variables better. It is crucial to identify that literature presents notions of agency stemming from individualism or social forces (Ahearn, 1999). By considering more variables that affect the individual's life course, future researchers can identify what directly affects academic agency. Additionally, this offers the potential to determine the groups of people primarily influenced by these variables.

Group Orientation by Year

This portion of our research was grounded in Mead's symbolic interactionist approach. Symbolic interactionism is based on the notion that meaning is derived from the social interactions that an individual encounters with those around them (Blumer, 1986). The self is a social product that is constructed and shaped by human experiences (Mead, 1934). Based on the symbolic interactionist approach, we hypothesized that group orientation would expose the impact that group membership has on a student's academic agency. We based many of our survey questions around the idea that group orientation and membership play an influential role in students' academic agency in each year of study.

To support this, we reviewed other literature that emphasizes the fact that an individual's social environment affects motivation and self-regulation (Schunk & DiBenedetto, 2019). Our findings indicate that this may not be entirely true in all circumstances. Many participants in our sample did not meet the criteria for any group orientation, deemed the *no definable orientation* group. In addition to this, the largest group in the sample was fourth year students who had no definable orientation ($n = 17$). This was followed by fourth year students who had a primary group orientation ($n = 10$). When considering all years of study, very few answered as having an affinity towards reference groups.

First-year students reported the highest level of reference group affinity, while fourth-year students reported the lowest level (refer to Figure 9). This displays that there is a weak negative correlation present between reference group orientation and year of study. This could be attributed to the fact that as you progress through university, the connections that an individual made in first year fade away. Students rely on reference groups for comparison, competition, and understanding their own behaviours (Cooley, 1909). In first year, the need to compare and compete with those around you could be stronger due to insecurity.

As previously mentioned, many participants in our sample identified as having no definable group orientation. Our findings indicated that the distribution of group orientation by year of study does not have a normal distribution (refer to Figure 10a and 10b). Our data also took individuals with dual orientation into account. Dual orientation refers to those who were past the threshold for both primary and reference group orientation. Dual orientation displayed a weak negative correlation with year of study. As an individual

progresses through school, they might place more importance in grades and academic success. Many students develop a growth mindset as they mature, causing them to persevere through challenges by reframing them as learning opportunities (Dweck et al., 2014). This mindset allows students to be content in their own abilities, causing them to put less effort into group membership, hence the negative correlation.

Overall, our research related to group orientation and year of study displays some interesting information. While some of the data did not provide significant findings, the negative correlation between reference group orientation and year of study provides some interesting points to consider. Students in upper years display better self-management techniques and more awareness of their own abilities (Cachia et al., 2018). As a result of this, fourth year students seem to be less reliant on group membership, signifying that students become more confident in their own abilities as they progress (Cachia et al., 2018). Fourth year students also have higher primary group affinity, meaning that individual's circles become smaller. First year students rely more on reference groups for comparison and reassurance. Social environments increase motivation for upward social comparison and collective efficacy (Donohoo & Hattie, 2018). First years place more value on status and creating connections early on. Further research regarding this finding could provide insight into additional reasons behind the negative correlation. It must also be taken into account that our study lacked an even amount of third year participants, which could have skewed the results.

Academic Agency and Group Orientation

Our analysis indicated that students with a salient primary group orientation had a 50.23% greater chance of scoring above the mean for academic agency (refer to Figure 11). This finding is in line with our hypothesis which stated that students with a strong affiliation to primary groups may report higher academic agency.

Bandura's Triadic Reciprocal Determinism (TRD) model asserts that human behaviour is shaped by the interplay between personal, environmental, and behavioural factors (Bandura, 1986). Given this definition, the TRD model was used to establish the connection and elaborate on the correlation found between academic agency and group orientation. By considering the reciprocal interaction between personal factors like academic agency, and environmental factors like group orientation, we gain a deeper understanding of the elements that contribute to students' behaviour related to academic motivation and agency (Bandura, 1986). In addition to the TRD model, the results were predicted using literature based on Meads (1934) theory which suggests that students' salient relationships with primary and reference groups can positively shape their academic identity and motivation (Anderman, 2018). This phenomenon was further elaborated on in the literature by suggesting that primary groups typically provide emotional support, guidance, and feedback, which can enhance students' motivation (Mead, 1934).

On the contrary, our findings suggest that students with a reference group orientation reported the lowest academic agency (refer to Figure 15). However, it is crucial to note that our sample size for the reference group orientation was very small ($n = 5$), which limits the generalizability of this finding. Further research with a larger sample size is required to see if the results still hold and uncover more accurate patterns between reference group orientation and academic agency. Osterman and Kottkamp's (2019) research suggest that reference groups, such as clubs and academic groups, provide

students with a sense of belonging to the academic community and set academic standards that students typically aspire to meet. Although this is not reflected in our analysis, our sample size is too small to state any significance.

Moving onto the specific measures of academic agency in relation to group orientation, particularly self-reflectiveness. Our study found a significant difference in self-reflectiveness between primary group orientation and reference group orientation. Students with a primary group orientation reported higher levels of self-reflectiveness compared to those with a reference group orientation (refer to Figure 12). This finding is consistent with Bandura's model, which suggests that personal factors, such as self-reflectiveness, play a key role in academic agency (Bandura, 1934). Moreover, Mead's theory suggests that group membership can also shape individuals' self-concept and behaviour. In our study, students with a reference group orientation reported lower levels of self-reflectiveness. Although our sample size for this given group is far too small, research by Mason and colleagues (2021) suggests that reference groups are often associated with external validation and comparison, which may detract from individuals' ability to engage in self-reflection. Therefore, future research should look into replicating this study with a larger sample size to further explore the relationship between group orientation, self-reflectiveness, and academic agency.

Our study also found significant differences between group orientations on scores for self-efficacy, which is a key component of Bandura's TRD model. Our analysis reflected that the students with a primary group orientation reported significantly higher levels of self-efficacy compared to those with a dual orientation or no definable orientation (refer to Figure 13). This finding is consistent with Mead's theory, which suggests that group membership can shape individuals' self-concept and behaviour (Mead, 1934). In our study, the primary group-oriented individuals were more likely to report higher levels of self-efficacy, which could be attributed to the positive influence of their primary group on their self-concept.

Overall, our study provides evidence that both personal factors and group membership are important in determining academic agency, particularly in the context of self-efficacy. Further building on this research can provide educators with information to design interventions that help students build their self-efficacy and develop strong positive relationships with their primary groups, which can support their academic success.

Limitations

Throughout the entirety of our research, we identified several limitations. Firstly, given our data was collected through a self-reported survey, students could have found it difficult to reflect accurately on their answers to our survey questions. Students may feel pressured in their answers to ensure their responses are not seen as outliers. In addition, students may be unaware of how their academic agency is indirectly influenced due to their social influences. As a pitfall to all questionnaires, the risk for social desirability bias existed in our research, where participants might fabricate answers rather than answer authentically. Concerns of being seen as an inadequate or underachieving student may have impacted individuals' responses. More specific to our research, there were conceptual limitations regarding academic agency as a construct.

There is a significant gap in research on group memberships impact on post-secondary students' academic agency (Cavazzoni et al., 2022). With this being our main area of

investigation, there was little existing research to base our study on. Previously written literature supported that there is no distinct definition of how agency is empirically measured (Cavazzoni et al., 2022). The absence of direction from previous literature allowed for several interpretations of how agency should be measured. Past studies on students involved interviews and assessments of classroom situations to monitor personal autonomy, we did not have this opportunity. We recognize the need to narrow down what is an effective measure for academic agency, with little evidence to base our approach, this was a limitation in our research.

Adding to our list of limitations, our sample was limited to 74 participants—58 of whom were female. The size of our sample restricts the generalizability of our findings, especially given that our sample was not representative. We are uncertain how the high number of females could have influenced our research, looking at the differences between males and females was not a focus of our research. Adding to this limitation, with a greater sample size, we would have been able to compare primary groups with reference groups and different years of study. Unfortunately, with so few participants reporting a reference group orientation, we cannot make viable comparisons with this group. Ideally, a quasi-design would have provided enough participants for each respective category.

Lastly, we were restricted in the number of demographic questions we could include in the survey. Therefore, we did not include measures of socio-economic status, race/ethnicity, and parental involvement. Due to the narrow focus of our research, we were not able to account for other life influences as factors. Consequently, there was potential for confounding variables that could have affected our findings. Future research should expand on our design and account for additional variables.

Significant Insights

Based on our research, we could not derive a significant correlation between academic agency and year of study. Notably, self-efficacy had a weak negative correlation with year of study. While many assumptions can be made to rationalize this negative relationship, our study does not establish a direct causal link. Further research is required to determine the underlying cause of this negative correlation. It is noteworthy to mention that while a negative correlation between self-efficacy and year of study was observed, this relationship does not hold across the other measures of agency. As the three other measures (self-efficacy, self-reflectiveness, and forethought) had a positive correlation with year of study, it was self-efficacy that weakened the correlation between academic agency and year of study. In all, the results could mitigate further research in the field of agency and specifically the measure of self-efficacy.

Our findings indicate that both lower (first and second year) and upper-year (third and fourth year) students exhibit a high group affinity. However, when comparing lower- and upper-year students, upper-year students exhibit a relatively lower inclination towards their family and reference group, which could be a topic for future research. Additionally, our research highlights the significance of group orientation and its impact on academic agency and identity, providing valuable insights into how students' experiences with group membership can shape their academic behaviours and success. Most importantly, we noted a significant difference between students who were primary group oriented versus students who had no definable orientation on their measure of self-efficacy. Additionally,

the results indicated a relationship between high affinity to primary groups and a higher self-reported academic agency measure.

Further research with larger sample sizes is required to uncover more accurate patterns between group orientation and academic agency. This could explore additional factors that may contribute to students' academic motivation and identity, and to fill in the current gap in the literature related to this concept. Overall, our study's findings provide a starting point for establishing empirical measures of academic agency and contribute to the scarce research on measures of agency. The provided insights can be valuable to students, educators, and policymakers in understanding the factors that affect academic agency.

Conclusion

Undergraduate students are met with a multitude of new experiences as they progress in their studies. Exercising intentional agency without awareness of the factors impacting it can be challenging. This makes research exploring these experiences essential to understanding the relationship between social relationships and academic agency. We explored academic agency with a focus on examining the relevance of year of study and salient social groups. We designed a questionnaire to understand how social relationships may affect a student's agency in academic contexts.

Using our anonymous survey, we explored the four core properties of agency which include self-efficacy, forethought, self-reflectiveness, and performance. Our data includes notable findings, which includes a weak negative correlation between year of study and self-efficacy as well as a weak positive correlation between year of study and the three remaining measures (forethought, self-reflectiveness, and performance). Additionally, our findings indicate that students with higher affinity to primary groups report higher levels of self-efficacy compared to students with no definable or a dual group orientation. We used multinomial logistic regression to derive statistically significant differences between these groups on scores for self-efficacy. Our results are in line with the hypothesis that states participants with a primary group orientation are predicted to score higher on academic agency. Although the direct cause is unknown, presence of such patterns reflects the impact of social groups on agency and encourage further research.

Our research can serve as a basis for utilizing academic agency as an empirical measure. Building on our findings and further investigating the factors impacting academic agency can assist in grounding this measure in literature. We aim to inspire future research that considers certain variables that directly affect academic agency and peoples' salient social groups.

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