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About Us
The McMaster Undergraduate Journal of Social Psychology is a student-run organization that was founded in 2019 by Namya Tandon, a fourth-year undergraduate student in the Honours Social Psychology program at the time. Dr. Sarah Clancy serves as the faculty supervisor for the journal. She supervises the capstone research projects that Social Psychology students complete during their final year of the program. The MUJSP aims to recognize the academic excellence of final year Social Psychology students by providing them with the opportunity to have their own work published in a journal.

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Acknowledgments
The MUJSP team would like to convey our sincerest gratitude to all those involved in this year's issue. This includes all the faculty and staff members involved, the editorial board, and the authors of the featured articles.

Sarah McBride, our Graphic Designer, created our cover art using the platform "Canva" and we would like to accord it due credit.

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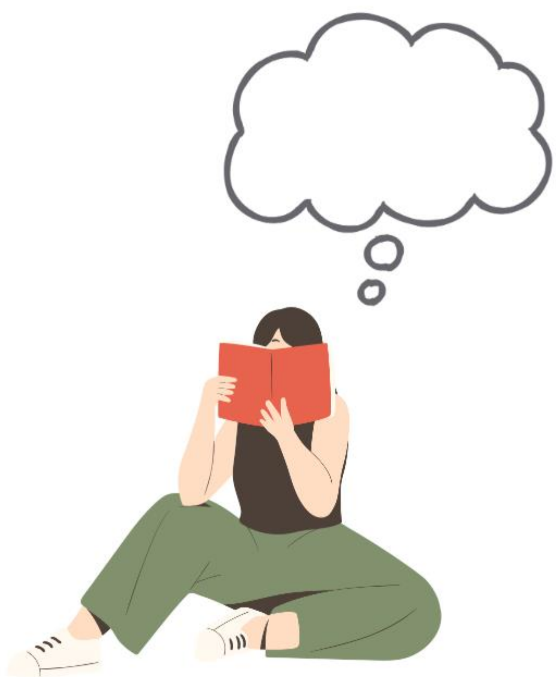

Editorial Team

The Importance of Research as an Academic and Social Learning Experience

A warm welcome and happy reading of the fourth issue of the McMaster Undergraduate Journal of Social Psychology! There have been several transitions in the editorial team of the McMaster Undergraduate Journal of Social Psychology for 2023. Raisa Jadavji, who graduated in 2022 from the Social Psychology Program, has stepped down as Editor-in-Chief. Raisa has been an inspirational student leader and alumnus who has made valuable and long-lasting contributions to the Social Psychology Program, taking part in sustainable initiatives that enhance and improve the student learning experience. As a long-term member of the McMaster Undergraduate Journal of Social Psychology, Raisa worked as an Assistant Editor before taking on the role as Editor-in-Chief in 2022. Raisa is currently pursuing a Master of Arts in Child Study and Education at OSIE. I have witnessed how Raisa creates and facilitates accessible, inclusive, equitable, and safe places for students to learn, develop, and grow both academically and socially. The education system is fortunate to have such an intelligent, dedicated, committed, and passionate individual in their ranks who I know will have a positive and indelible impact on the lives of the students she teaches. Raisa – thank you for your contributions to the McMaster Undergraduate Journal of Social Psychology over the years – you are awesome! You will be greatly missed, but the entire team wishes you success in all your future endeavours.

I am pleased to welcome Linette Sapper to the role of Editor-in-Chief. Linette recently graduated from the Social Psychology Program in June 2023. I had the pleasure of supervising Linette's group thesis in 2022/2023, as well as teaching Linette in several course during her degree. Linette has been an excellent leader for the editorial team as the incoming Editor-in-Chief. Linette is not new to the journal however, having previously served as co-assistant editor. Linette has taken on the role of Editor-in-Chief with ease, showing commitment, patience, dedication, and professionalism in her role. Linette has been a valuable member of the McMaster Undergraduate Journal of Social Psychology for several years. The journal is so lucky to have Linette in the role of Editor-in-Chief this year – thank you for all your hard work over the years, Linette. It has not gone unnoticed – you are incredible!

There have been several other transitions at the McMaster Undergraduate Journal of Social Psychology over the past year. Angelo Marmolejo is continuing to serve as a co-assistant editor (thanks, Angelo!), joined now by Ayma Iqbal, who we warmly welcome to the editorial team. Sarah McBride has continued as Graphic Designer (thanks, Sarah!). Finally, Christina Doan has remained in her role as the layout editor (thanks, Christina!). The entire team sends best wishes and thanks to Raisa as she embarks on new opportunities, continued thanks to returning editorial board members, and extends a

warm welcome to all new editorial members of the McMaster Undergraduate Journal of Social Psychology!
The most recent 2022-2023 Social Psychology capstone class consisted of 20 thesis project groups with 106 enrolled students. This year, there were five thesis papers that met the minimum standard of excellence of a grade of 85% or higher on the final thesis paper submitted for the capstone course, as per the publication criteria. The 2023 published papers highlight the socially relevant, interesting, and informative topics under investigation, including (ordered alphabetically by study title): **"Am I a Leader or a Follower?": Examining Social Media Use Through the Lens of Social Conformity and Individuality** by Rachel Dennison, Yumna Qaisar, Linette Sapper, Melanie Selvaggi, Safaiya Tobala; **Comparing the Psychological Well-being of International and Domestic Students** by Laurie Baker, Shaza Zahir Hassan, Christine Huang, Karolina Kalashnikova, Monserrat Ramirez Ruvalcaba; **Impact of Social Groups on Academic Agency in Lower-Year and Upper-Year Students** by Dana Alnahhar, Maya Mehta, Arielle Ngai, Nayla Pietras, Conrad von Palleske, Vivian Wu; **Rates of Imposter Syndrome Among Female-Identifying Individuals in Undergraduate STEM Programs at McMaster University** by Alyssa Cockburn, Al-Ain Dalisay, Olivia Eakins, Lana Abdul Raheem, Alison Rogers; and, **The Association Between Birth Order & Attachment Style** by Molly Clayton, Cassidy Colalillo, Jaskiran Guraya, Fatima Malik, Margaret Miller, Emily Vieira.

The papers published in this year's edition of the McMaster Undergraduate Journal of Social Psychology explore the diverse lived experiences of university-aged students, including psychological well-being, feelings of mastery, competency and belonging, perceptions of attachment, and the connectedness to and the impact of social connections both in-person and via social media. The published papers highlight the importance of research at the undergraduate level in the capstone course as it provides not only a hands-on experiential learning experience for the enrolled students, but an important platform for the voices, experiences, and lived realities of McMaster University undergraduate students who participate in the research to be heard, recognized, and shared. While only a portion of the thesis papers completed during the 2022-2023 academic year are included in this issue of the McMaster Undergraduate Journal of Social Psychology, the work completed by the entire class is commendable and should be recognized. If you would like to know more about the other projects completed during the 2022-2023 academic year, please see this link: https://socialpsychology.socsci.mcmaster.ca/stories/4zz6-capstone-class-poster-showcase/

Since the 2022 edition of the McMaster Undergraduate Journal of Social Psychology, publication of the abstracts of the presenters from the Social Psychology Undergraduate Research Conference has occurred. I hope you enjoy reading about the interesting papers presented at the second annual Social Psychology Undergraduate Research Conference! Please join me in congratulating all those on the presentation of their work at the conference and the publication of their abstracts! You can read more about the 2022 conference at this link: https://socialpsychology.socsci.mcmaster.ca/stories/congratulations-presenters-and-conference-developers-organizers-of-the-2nd-annual-social-psychology-undergraduate-research-conference/

I hope you enjoy reading the important, interesting, and socially relevant social psychological research studies of the five respective groups featured in the fourth issue of the McMaster Undergraduate Journal of Social Psychology, along with the conference abstracts from the second annual Social Psychology Undergraduate Research Conference. The collection of work in this publication showcases the academic excellence and achievements of the students in the Social Psychology Program. The entire editorial board should be commended for their hard work and dedication on the publication of the fourth issue of the McMaster Undergraduate Journal of Social Psychology. I continue to be honoured to work, as Faculty Advisor, alongside intelligent, motivated, dedicated, and inspirational students: Angelo, Ayma, Christina, Linette, and Sarah, who serve as editorial board members, along with the five groups who were eligible for publication this year and the individuals and groups with published abstracts from the conference. Congratulations to all involved in the publication of the fourth issue of the McMaster Undergraduate Journal of Social Psychology - your hard work, dedication, and inspiring work is recognized, respected, and appreciated!

Sincerely and with best wishes,

Dr. Sarah Clancy, PhD
Faculty Advisor, McMaster Undergraduate Journal of Social Psychology
SOC PSY 4ZZ6 Capstone Instructor and Thesis Supervisor for all student group projects
Assistant (Teaching) Professor
Honours Social Psychology Program
Department of Health, Aging and Society
McMaster University

Letter from the Outgoing Editor

Dear MUJSP Readers,

Welcome to the 2023 issue of the McMaster Undergraduate Journal of Social Psychology! I hope you are looking forward to reading very thoughtful and exciting capstone research papers from fourth year students within the Social Psychology program, in addition to abstracts from this year's Social Psychology Undergraduate Research Conference.

I would first like to extend my gratitude and appreciation for our current Editor-in-Chief, Linette Sapper. Linette has taken over this role so effortlessly and has worked tirelessly with the rest of the team to publish this issue. I commend her for her diligence and hard work in ensuring that the MUJSP continues to be a welcoming space where students can share their work and feel proud of their accomplishments. I also want to recognize our current Assistant Editors, Angelo Marmolejo and Ayma Iqbal, our Graphic Designer, Sarah McBride, and our Layout Editor, Christina Doan, for their continued efforts and commitment to the MUJSP. The time, energy, and thought they put into this current issue is much appreciated. I would also like to thank Namya Tandon, MUJSP's first Editor-in-Chief who founded the journal in 2019. Namya created this wonderful space for collaboration and learning, and I know her contributions to this journal will continue to have a positive impact on future students. We are deeply appreciative for all she has done for the Social Psychology community at McMaster University. Lastly, I would like to extend my utmost gratitude to our Faculty Advisor, Dr. Sarah Clancy, who has supported the journal since its creation. Dr. Clancy always puts her students first and continues to create different learning spaces and opportunities that enable students to thrive and grow as individuals. Her dedication to the MUJSP each year does not go unnoticed. Dr. Clancy, thank you for your kindness, empathy, and encouragement – this would not be possible without you.

I have thoroughly enjoyed my time at MUJSP, both as an Assistant Editor and as Editor-in-Chief, and I am thrilled to be leaving it in very capable hands. I am looking forward to continuing my journey with the MUJSP as an avid reader of every issue.

Thank you to all of you for your continued support of the MUJSP, I hope you enjoy the outstanding research papers and insightful conference abstracts presented in this issue. Happy reading!

Best,
Raisa Jadavji
Outgoing Editor-in-Chief

Letter from the Editor

Dear MUJSP Readers,

I am pleased to welcome you to the 2023 issue of the McMaster Undergraduate Journal of Social Psychology! For those who may be unfamiliar, the MUJSP recognizes the outstanding original research studies completed by undergraduate students in their final year of the Honours Social Psychology program. Now in its fourth year of publication, the MUJSP continues to highlight the scholastic achievements of McMaster students, only publishing studies that have met rigid standards of excellence. As of last year, the journal also began showcasing abstracts presented at the annual Social Psychology Undergraduate Research Conference.

This year, there are five research studies that have met the standards for publication, as well as nine research abstracts that were presented at the conference. A variety of topics are covered within this issue, including studies on attachment styles, imposter syndrome, social conformity and labelling theory, mental health literacy, and the impact of social groups on academic agency.

I am honoured to be sharing this year's issue with you all as Editor-in-Chief after serving as an Assistant Editor for the MUJSP last year. My experience on the team this past two years has been nothing short of valuable in cultivating my own research skills and interests, and my wish is for anyone who reads this journal to feel the same motivation in pursuit of their own academic endeavours.

I would like to extend my sincerest gratitude to the entire editorial team, starting with the original Editor-in-Chief of the MUJSP, Namya Tandon, without whom the MUJSP would not exist today. Thank you, Namya, for giving McMaster students the opportunity to publicly contribute their insightful literature to the broader field of social psychology. I hope we have fulfilled your every expectation for the journal in this year's issue and continue to do your vision for the MUJSP justice. As well, I would like to express my appreciation to last year's Editor-in-Chief, Raisa Jadavji, whom I had the pleasure of working alongside as assistant editor for the 2022 issue. Raisa, you were an exemplary Editor-in-Chief and I am proud to say I learned from the best!

As for this year's editorial team, I would like to further extend my gratitude to our two wonderful assistant editors, Ayma Iqbal and Angelo Marmolejo, our talented graphic designer, Sarah McBride, and our incredibly diligent layout editor, Christina Doan. Working alongside everyone on this team was truly a privilege. I would also like to say thank you to Shaza Hassan, one of the research conference organizers, who played a valuable role in ensuring the publication of the abstracts presented this year. Finally, I would like to express the utmost appreciation to Dr. Sarah Clancy, the faculty advisor of the MUJSP. Thank you, Dr. Clancy, for your unwavering support throughout this year's publication journey. Your dedication to the success of the journal, and all the students whose work is published within it, is greatly appreciated; none of this would have been possible without your guidance.

On behalf of the entire editorial team, thank you for taking the time to read the compelling research presented in this year's issue of the MUJSP. We appreciate your support, and we hope you enjoy!

Sincerely,
Linette Sapper
Editor-in-Chief

“Am I a Leader or a Follower?”: Examining Social Media Use Through the Lens of Social Conformity and Individuality

Rachel Dennison[1], Yumna Qaisar[1], Linette Sapper[1*], Melanie Selvaggi[1], Safaiya Tobala[1]

Abstract

The importance of the role social media plays in modern communication has become increasingly evident. As an information-sharing platform, it allows users to collaborate, befriend others and engage in friendly banter, or identify key social issues. As such, it became apparent that further research on social media would allow us to gain further insight into a user’s willingness to self-express online. This led to the inquiry of three research questions; the first seeks to examine whether social media promotes conformity, followed by whether social media can also promote individuality, and lastly, whether a fear of being labelled affects self-expression. To study this phenomenon, we created an anonymous online survey to broadcast to the McMaster University undergraduate population. This survey garnered 37 complete responses which we then analyzed using statistical software and thematic analysis. It was found that social media promotes conformity more than it does individuality due to the lingering fear of being labelled by fellow users. In an increasingly digital world, it is essential that we commit to understanding the serious impact that the usage of these platforms is having on people’s ways of communicating and expressing themselves.

Introduction

Social media has become a powerful tool for exchanging and collaborating on information often packaged in the form of posts, likes, comments, sharing content, and displaying news. Users can then digest this information by choosing to align with it and the online majority or deciding to stand out and follow their own lines of thought. As such, the goal of this research was to understand how adults engaged with social media and whether the majority opinion online swayed users’ thoughts, actions, and behaviours more than it encouraged the expression of individuality.

Social Psychological Context

Our research was influenced and shaped by existing social psychological theories and concepts that we deemed applicable to this topic of social media use. We examined social

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[*] While I serve on the editorial board for the journal, there are no conflicts of interest in publication as all grading and final selection of papers eligible for publication were conducted at arms-length, with Dr. Clancy evaluating all final thesis papers and independently contacting the groups who were eligible for publication.

media usage through the lens of social conformity and individuality. Additionally, we assessed the contributing factors to social conformity such as a desire to gain social capital (i.e., a sense of community and likeness with others) through the maintenance of a carefully curated online self-presentation (i.e., the capacity to engage in relational maintenance with others). We were also interested in investigating the prospect of being labelled by the online majority as a potential consequence of nonconformity. We drew on several prevailing social psychological paradigms for the foundations of our research questions such as Asch's social conformity, Janis' theory of groupthink, labelling theory, dramaturgical theory, and attribution theory.

Research Questions

To provide us with a sense of direction, three central research questions were developed. The first of these was, "Does social media promote conformity?" Technology is ever-evolving and it continues to have great influence on our lives, made clear through the advent and rise of various social media platforms. On these sites, users are given free rein to broadcast their personal lives to the masses, share trending posts, and discuss their thoughts on an array of issues, ranging from mundane to complex. As such, we wanted to explore the impact that this form of media is having on individuals in terms of how likely they were to think and behave in a similar manner to those that they followed or idolized online. This was not isolated to close friends and family members that interact with one another virtually, but also the general population's activity on these platforms. This first research question was designed to better understand the social desirability tendency that users may exhibit, affecting their level of conformity.

Our next question was as follows: "Can social media promote individuality?" We were interested in shifting some of our focus to individuals who may have displayed a tendency to deviate from behaviours of conformity and what factors were driving them to do so. We hoped to gain more of an understanding of those who did not conform, and as a result, potentially risked stigmatization or social isolation. With this in mind, we considered how being labelled may have impacted an individual emotionally if backlash was experienced from members of the majority. This was an important element to explore, as it looked into the possible effects of expressing individuality on social media.

This inspired our final research question: "Does a fear of being labelled affect self-expression?" We wanted to investigate the impact of having a label attached to oneself and how this may have threatened an individual's sense of self. We were interested in answering this question, as it could have potentially informed us about whether displaying individuality was frowned upon in online spaces and if a fear of being associated with a negative label led people to alter their self-presentation on social media.

Purpose of the Research

Our main purpose for conducting this research was to understand if social media prompts individuals to socially conform to the thoughts, feelings, and actions of the majority and whether social media can also be used for the opposite – to deviate from the majority and freely self-express. Some people may use social media to run counter to these majority-held viewpoints and, instead, explore different avenues of thought that may not be wildly popular or conventional. In this way, we sought to expand on previous research affirming that online social conformity is a real phenomenon. However, we looked to further investigate if social media platforms could be utilized to also express individuality and the potentially associated consequence of labelling as a factor affecting self-expression. By studying the experiences of undergraduate students at McMaster University who were 18 years of age and older, we strived to learn how this demographic attempted to either fit in or stand out in this technology-driven society, through the use of social media as a tool to voice their opinions, ideas, and beliefs.

Overview of Paper

To further elaborate on this topic, we conducted a thematic analysis of previous research on this subject matter in the form of a literature review, as well as addressed the appropriate theoretical frameworks that served as a basis for our study. Then, we detailed our methodological approach by outlining the various steps involved in the research process, as well as any ethical concerns associated with our research, and highlighted the data analysis procedures implemented to make sense of our findings. This was followed by a summary of our results through figures and text, a discussion of our research findings and their place in the broader literature, and finally, notable limitations and insights made evident throughout our study.

Literature Review

Conformity

Due to the abstract nature of groupthink symptoms, past literature has relied upon operationalizing and conceptualizing groupthink and its conditions to research it effectively (Kameda & Sugimori, 1993; Turner and Pratkanis, 1998; Matusitze & Breen, 2012; Wyemayake et al., 2021). For example, Kameda & Sugimori's (1993) research used collective entrapment, which shares a strong likeness to groupthink, to understand how and when collective entrapment occurred in groups under unanimity rule or majority rule (Kameda & Sugimori, 1993). The conceptualization and operationalization of groupthink and its conditions were found in most of the literature, which made finding results for our initial research inquiry, how social media affects groupthink, difficult (Kameda & Sugimori, 1993; Turner and Pratkanis, 1998; Matusitz & Breen, 2012). The concept of conformity was intriguing as it shares a slight similarity with groupthink (Janis, 1972 & Asch, 1955).

Wijenayake et al., (2021) produced a similar experiment using a Facebook survey where participants were shown a fake news article with no comments and then were asked to rate their "familiarity of the article, their opinion on the article's trustworthiness, and their confidence on the provided trustworthiness rating" (Wijenayake et al., 2021, p. 14). They were then asked how they would respond to the article or if they would respond at all and were given the choices of "commenting, fact-checking, sharing, or reporting it" (Wijenayake et al., 2021, p. 14). Participants were then shown the unaltered news article, intact with the original comments, and were asked to read the comments thoroughly and to determine whether they were reassuring or skeptical of the article's credibility (Wijenayake et al., 2021). The participants were asked a second time to relay their opinion regarding the article's credibility and to provide their level of confidence in their rating of the article's credibility (Wijenayake et al., 2021). The results showed that participants altered their opinions about the news article's credibility after they had been provided with information about how other readers felt about the credibility of the news article (Wijenayake et al., 2021).

This study is a great example of Asch's (1955) conformity experiment being conducted by using a social media platform (Asch, 1955; Wijenayake et al., 2021). However, there was a distinct difference between the studies, and that was the absence of a fictitious peer group or authority figure, whose role was crucial to the original experiment (Asch, 1955; Wijenayake et al., 2021). This would suggest that a strong influence, such as an authority figure or group of peers, whether real or imagined, is not needed for conforming behaviours to take place (Asch, 1955; Wijenayake et al., 2021). Most of the literature we found on conformity and social media uses Asch's (1955) technique of exposing and/or revealing the responses or comments of other people on social media to the individual (Asch, 1955; Wijenayake et al., 2021; Kelly et al., 2017; Zhu & Huberman, 2014; Colliander, 2019; Neubaum et al., 2018). Random comments and responses by unknown social media users, whether real or manufactured, appear to be enough to sway the opinion of an individual (Asch, 1955; Wijenayake et al., 2021; Kelly et al., 2017; Zhu & Huberman, 2014; Colliander, 2019; Neubam et al., 2018).

Kelly et al., (2017) produced a similar study where statistics about how others responded were provided to participants and were sufficient to produce "conformity in moral judgements" (Kelly et al., 2017, p. 65; Asch, 1955). This suggests that merely providing statistical information is also enough to induce conformity on behalf of individuals online (Kelly et al., 2017). This realization was crucial to our understanding of conformity because the remaining literature that we found surrounding the concept of conformity and social media usually encompassed exposing users to comments, shares, and likes by other anonymous social media users (Asch, 1955; Farmer et al., 2018; Packer, 2009; Colliander, 2019).

The concept of desiring to be socially accepted being tied to conforming behaviours online is something Colliander (2019) attempted to understand. Specifically, the role that positive self-concept plays on social media platforms when it comes to sharing, commenting, and re-posting fraudulent news articles (Colliander, 2019, p. 203). The goal was to understand how maintaining a positive self-concept online influenced the users' likelihood to conform to the belief and opinions of other users about whether a news article was fraudulent (Colliander, 2019, p. 203). The hypothesis theorized that users would conform to "others' beliefs and behaviors in order to enhance, protect, or repair their self-esteems" (Colliander, 2019, p. 203). It was found that users who were exposed to negative comments regarding the fraudulent news article were more likely to comment negatively, hold negative attitudes about the article, and were more likely to share the article (Colliander, 2019). Furthermore, it was found that disclaimers that were placed upon potentially fraudulent news articles, that are used by social media companies to help stop the spread of misinformation, were not as effective as user comments (Colliander, 2019). Users on social media heavily relied upon other users' comments as a tool in deciding whether the news article was fraudulent and highly influenced their reactions, including their intention to share or comment on the fraudulent news article (Colliander, 2019). This finding was pivotal to our understanding of conformity and social media because it showcased how conformity can be used as an impression management tool to help users maintain a positive self-concept online (Asch, 1955; Colliander, 2019). It also showcased the powerful influence that online users possess as people are more likely to adhere to the opinions and beliefs of other social media users rather than adhere to corporate disclaimers and warnings (Asch, 1955; Colliander, 2019). This would suggest that group and/or majority opinion, whether it be a group of peers or a group of anonymous strangers online, is more influential than a corporation, which could be interpreted as an authority figure expressing a cautionary warning (Asch, 1955; Colliander, 2019). Furthermore, it implied that what is deemed misinformation, or fraudulent news, is determined by comments made by other social media users, which would suggest that the spreading of misinformation and fake news articles is in the hands of the majority opinion held within those comments (Asch, 1955; Colliander, 2019).

It became obvious that majority influence was a meaningful, contributing factor in eliciting conforming behaviours among social media users (Asch, 1955; Colliander, 2019; Wijenayake et al., 2021; Neubaum et al., 2018; Zhu & Huberman, 2014; Farmer et al., 2018). Many of the studies utilized methodology that took into consideration the number of likes, shares, comments on a post, and whether the comments were majority positive or negative, to determine what combination of factors induced conformity on social media platforms (Asch, 1955; Colliander, 2019; Wijenayake et al., 2021; Neubaum et al., 2018; Zhu & Huberman, 2014). The results measured the participants' likelihood to share, like, or comment based upon what was shown to them (Asch, 1955; Colliander, 2019; Wijenayake et al., 2021; Neubaum et al., 2018; Zhu & Huberman, 2014). A majority influence in the form of likes, shares, opinions, and comments was usually the determining factor that facilitated conforming, behavioural reactions online (Asch, 1955; Colliander, 2019; Wijenayake et al., 2021; Neubaum et al., 2018; Zhu & Huberman, 2014).

However, Neubaum et al., (2018) wanted to see how “peer reactions influenced behavioural reactions” (p. 185) offline. Specifically, how an online “call to vigilantism” (p. 189) influenced offline behaviour among users (Neubaum et al., 2018). Users were more likely to engage in offline behaviours when the users strongly identified with the commenters (Neubaum et al., 2018). Additionally, users who were higher in empathy and altruism were more likely to engage in offline behaviours regardless of other users' reactions (Neubaum et al., 2018). This finding suggests that social identification plays a role online and can influence offline behaviours among social media users (Neubaum et al., 2018). It also highlighted how users' dispositional traits, such as empathy and altruism, play a role in whether users conform to group reactions and participate in offline behaviours related to vigilante justice (Neubaum et al., 2018).

Users who strongly identified with a group of peers or an anonymous group of online users, were more likely to conform to the ideas, opinions, and beliefs of that group, and thus, were more likely to engage in behaviours offline that are related to the ideas, opinions, or beliefs of that group (Neubaum et al., 2018). Furthermore, users who have higher levels of empathy and altruism can override the opinions and reactions of others if the users feel that they are engaging in a prosocial behaviour or positive cause (Neubaum et al., 2018).

This is important to our research inquiry because it is evidence that online interactions can influence ideas and opinions which can ultimately result in real-world actions (Neubaum et al., 2018). These actions can potentially have real-world consequences, good or bad (Neubaum et al., 2018). Furthermore, it is also evidence that certain emotional dispositions can overpower the desire to conform depending on the subject matter, in this case, a call to vigilantism (Neubaum et al., 2018).

Individuality

The concept of individuality has many versions, but arguably the first proposal of the idea of individuality came from John Stuart Mill (Hinchman, 1990). Individuality is best understood in the context of the contrasting concept of conformity (Hinchman, 1990). Mill described individuality as an expression of one's own desires and varying aspects of their personality (Hinchman, 1990). He argued that "taken-for-granted" aspects of the self must be externalized to be able to achieve an individual identity (Hinchman, 1990, p. 761). It is important to note that individuality is not synonymous with the term individualism. The idea of individuality is in opposition to the idea of conformity, which is relevant to our paper's main focus. The main goal of this paper is to see whether adults conform or if they extract different ways of thinking and ultimately form an opinion that is unique from the majority-held opinion.

Individuality can be measured or conceptualized as the ability to express yourself without fear (Bailey et al., 2020; Orehek & Human, 2017; Fox & Warber, 2015; Ma & Zhang, 2021). Authentic self-expression is said to help individuals "affirm their sense of self" (p. 2) through asserting an individual's personal traits (Bailey et al., 2020, Orehek & Human, 2017, p. 60). Bailey et al. (2020) aimed to understand how the need for authentic self-expression, and the desire to present an idealized version of oneself on social media, can create inner conflict and tension on behalf of social media users (Bailey et al., 2020). The tension arises because both serve a psychological, yet contradictory, need that comes with different costs (Bailey et al., 2020). Self-idealization has been described as a "fundamental part of human nature" (p. 2) as it allows individuals to curate an image of themselves that is socially acceptable and allows others to view them positively (Bailey et al., 2020). However, if an individual behaves in a way that deviates from the carefully curated image that they have created for themselves, they are likely to experience psychological distress, conflict, and intense emotional despair (Bailey et al., 2020).

Using "the Five Factor Model of personality" (p. 2) and Quantified Authenticity, which assessed "authenticity as the proximity between the self-view and self-expression" (p. 7), Bailey et al. (2020) hypothesized that people who were higher in "authentic self-expression of personality characteristics" (p. 2) would have higher levels of life satisfaction. Furthermore, it was also theorized that individuals who were higher in authentic self-expression would not all benefit from authentically expressing themselves online (Bailey et al., 2020). The reasoning behind this was due to certain traits being perceived by others as more socially acceptable than others (Bailey et al., 2020). Those who held more acceptable traits would be more likely to undergo lessened inner conflict and "tension between self-idealization and authentic self-expression on social media…" (Bailey et al., 2020, p. 2).

It was found that "...authentic self-expression on social media was correlated with greater life satisfaction" (Bailey et al., 2020, p.7). However, there was inconsistent evidence to support the notion that individuals with particular personality traits would benefit more from self-expression online (Bailey et al., 2020). This finding suggests that users who prioritize being authentic and true to themselves online have a better quality of life (Bailey et al., 2020). This may imply that users who sacrifice their authenticity and conform to social norms or majority opinion could have lower life satisfaction and overall well-being (Bailey et al., 2020). This is an important finding because it highlights the important role that individuality plays when it comes to social media users well-being and could imply that users who use social media as a means to authentically express themselves, and who avoid conforming, could be at a greater advantage psychologically, emotionally, and in everyday life as they are remaining true to themselves in the face of online pressure (Bailey et al., 2020).

Although authentically expressing oneself online is shown to have positive outcomes for social media users, the literature does not take into consideration reasons why some users may not participate in expressing themselves online (Bailey et al., 2020; Fox & Warber, 2015). Marginalized, minority groups such as the LGBTQ+ community are an example of a group of social media users who may want to express their identity and romantic relationships on social media but instead stay silent out of fear of the potential consequences that could result from doing so (Fox & Warber, 2015). Fox and Warber (2015) wanted to understand how members of the LGBTQ+ community experienced self-expression on social media using “spiral of silence theory” (p. 86) as it “details the process wherein individuals remain silent about salient moral issues when they believe that their opinion is in the minority” (p. 83). The spiral of silence emphasizes the idea that the majority opinion is constructed, implemented, and reinforced by individuals who are a part of mainstream culture and who do not belong to minority groups (Fox & Warber, 2015). As a result, the majority opinion is deemed socially acceptable, and therefore, individuals whose opinion aligns with the majority opinion will feel more inclined to speak their opinion and individuals whose opinion does not align with the majority will likely avoid stating their opinion due to the fear of being ostracized and punished (Fox & Warber, 2015).

Opinions on matters that are based on “moral or ideological” (p. 83) frameworks can often foster a hostile and divisive environment which can fuel the spiral of silence (Fox & Warber, 2015). LGBTQ+ opinions and issues usually fall under this category which forces members of the LGBTQ+ community into utilizing self-censoring strategies such as remaining silent, removing themselves from the discussion, or agreeing with the majority to avoid conflict (Fox & Warber, 2015).

Fox & Warber, (2015) wanted to see how the spiral of silence played out on Facebook with LGBTQ+ participants. They found that the spiral of silence was evident in online communications, particularly with individuals who were not “out” (p. 86) to their family, friends, or colleagues. Most cited that religion or highly conservative values among their peers, family, and social groups were the reasoning behind why they chose to remain silent. The spiral of silence took on many forms such as individuals not changing their relationship status or refusing to share their identity online. Additionally, they did not post photos of themselves with their significant other if they were in a relationship, did not share pro-LGBTQ+ political stances, and did not engage with homophobic or transphobic posts that were shared by friends or family.

Being able to show your true self and express your authenticity online seems to be a privilege that is only accessible to certain groups of people or to those who hold the majority opinion (Fox & Warber, 2015). This relates to our research inquiry because it implies that minority users will be more likely to conform out of fear or hide and remain silent (Fox & Warber, 2015). It also showcased why minority group members go along with narratives that seem counterproductive or even dangerous to their group's interest (Fox & Warber, 2015). Furthermore, it highlighted how individuality in the form of self-expression can be stalled and turned into conforming behaviour due to overwhelming fear

(Fox & Warber, 2015). Majority opinion, in this case, would seem to reign supreme when deciding individuality and conforming behaviour (Fox & Warber, 2015).

Self-expression is a way for individuals to showcase who they are through communication styles that highlight their authentic attributes and traits (Orehek & Human, 2017). Individuals desire others to view their unique personality and attributes as socially acceptable and for others to be able to identify their personality traits accurately (Orehek & Human, 2017). Expressing your personality traits and having others affirm and accurately perceive those traits is a normal occurrence in day-to-day interactions, however, this changes when communication and self-expression are being done online (Orehek & Human, 2017).

Orehek & Human (2017) wanted to uncover if Twitter allowed users to showcase their personality traits and have them be perceived “accurately and positively” by other users (p. 60). They found that anonymous Twitter users were able to perceive specific personality traits such as impulsivity and self-esteem online, however, in person interactions were higher in accuracy. Furthermore, users also perceived the personality traits of other Twitter users positively.

This is relevant to our research inquiry because it implies that individuality, in the form of authentic self-expression of individual traits, can be perceived and regarded as positive on social media platforms (Orehek & Human, 2017). This would also suggest that individuality itself is regarded in a positive way, and as a result, could foster an environment that promotes individuality and self-expression online which could potentially lead to a higher level of users choosing to participate in expressing themselves authentically, without fear and to avoid conforming (Orehek & Human, 2017).

Self-expression is key to understanding how individuality is presented on social media platforms, however, opinion expression is another form of self-expression that “refers to individuals’ eagerness to share or post their opinions in public” (Ma & Zhang, 2021, p. 2). Ma and Zhang (2021) wanted to see how opinion dynamics influenced opinion expressions in “social media chat groups” (p. 1) like WhatsApp. The opinion dynamic proposes that individuals must perceive that they have support from their friends in the group and must have willingness to express an opinion (Ma & Zhang, 2021). If individuals believe that they have the support of their friends then they will be more willing to express their opinion (Ma & Zhang, 2021).

It was discovered that perceiving a decline in support from friends in the group would drastically “increase individuals’ expression willingness to protect his/her opinion” (Ma & Zhang, 2021, p. 1). Furthermore, people who held a minority opinion were more fragile when it came to having a friend or friends who changed their support and were more willing to express themselves as a result (Ma & Zhang, 2021).

These results are important because they highlight how individuality, in this case opinion expression, prevails in social media group chats whether or not an individual feels that they have the support of their friends (Ma & Zhang, 2021). This would suggest that, among groups of friends online, individuality would prevail over conforming behaviours (Ma & Zhang, 2021). It would also suggest that friendship, or online groups whose members are close and share a common interest, facilitates individuality rather than conformity online (Ma & Zhang, 2021).

Social Capital

Social capital is defined as a sense of community and the feeling of ‘likeness’ with others (Barker et al., 2013). Social capital has been increasingly acquired through virtual means, specifically on social media sites. Julien (2015) discussed digital social capital and argued that internet memes themselves are a sign that a user is a part of this process of expanding their digital social capital. Users shared memes as a way to expand their social networks and relationships based on this one item (Julien, 2015). This idea can be extrapolated to other social media avenues such as posts, tweets and comments that illustrate that once a user posts such content online, they are already acquiring their digital social capital through this process of posting and engaging with other users' opinions on that post. In addition, Phua et al., (2017) looks at the different ways you can engage with social media through the intention of either using bridging or bonding social capital. For Twitter users, they mainly acquire social capital through bridging capital by posting surface-level tweets and engaging with strangers about the tweet (Phua et al., 2017). They do not develop an intimate level of connection or relationship besides the tweet (Phua et al., 2017). On the other hand, users on Snapchat and Facebook acquire social capital through bonding capital (Phua et al., 2017). These users are likely to seek out intimate support, emotional support, and general advice from close friends (Phua et al., 2017). As such, this suggests that social media sites are an emerging way to expand one’s social capital. This is dependent upon the type of social media used and whether bridging or bonding capital would be appropriate in the acquisition of social capital.

Social capital is a big factor when engaging on social media sites. The concept of social capital will help us understand the extent to which users engage with social media and if the opinions of online strangers matter. In particular, it will help us determine how social media engagement differs depending on the platform and the intention that frequent social media users have with interacting and conforming to other users’ opinions. However, this research does not explicitly identify if social media sites and the types of social capital influences social conformity or self-expression. As such, it is the goal of this research to understand if social capital is a factor in the behaviour of social conformity or self-expression on social media sites. Thus, digital social capital is a new avenue that individuals are acquiring to expand their networks and relationships with others and whether to label these networks as weak-tie or strong-tie relations.

Self-Presentation

Self-presentation is the intention to perform an image in an online sphere (Trieu & Baym, 2020). Trieu and Baym (2020) investigate the phenomenon of self-presentation of users on Instagram and its influence on relational maintenance with others. In the case of posts, users are likely to spend significant time editing and crafting a specific image of themselves to post to a public audience and ensure that it is worthy of praise (Trieu & Baym, 2020). However, when sharing private Stories, users had lower expectations of presenting themselves carefully, and wanted to build relationships with users they knew instead (Trieu & Baym, 2020). When the story was set as a private setting, users were less worried about the content of the story being posted and had lower expectations of the types of responses received on their story (Trieu & Baym, 2020). As well, relational maintenance was preferred when engaging with Stories because it allowed for attention and interest of the story that would lead to a relationship (Trieu & Baym, 2020). On the other hand, Johnson and Ranzini (2018) investigate self-presentation through three motives which included: actual-self, ideal-self, and ought-self, and how it influences the behaviour to selectively share film and music preferences on social media. Ideal-self is broken down into own-ideal self and other-ideal self. It has been found that individuals that reflected their own-ideal selves would express less unique music and movie preferences (Johnson & Ranzini, 2018). This means that users who are motivated to seek belongingness with the consensus opinion may deviate from providing unique preferences over mass media content (Johnson & Ranzini, 2018). As such, exercising self-presentation allows users to be conscious of what they post on social media as well as having a preference over a certain opinion.

The research on self-presentation informs our research by allowing us to investigate the motivation behind why a user posts certain types of content on social media. As well, it will highlight the impact that social conformity has on how a user decides what is appropriate to share with their followers and what should be kept private. In terms of informing our research questions, self-presentation illustrates that in the public domain of social media, users are likely to craft their responses and posts in accordance with popular opinion. On the other hand, in the private domain of social media, users are likely to voice a different opinion and express themselves honestly with known followers. However, there is a lack of research that does not take into consideration conforming to different opinions. Instead, the research heavily focused on posts, stories and likes. As well, the research inadequately explained the aspect of labelling and the fear that could consume a user if they were to deviate from the consensus opinion or post. Thus, self-presentation is a crucial process that social media users engage in. They use self-presentation as a motivation to reflect on how to craft the best image of themselves online without deviating from the consensus opinion.

To conclude, this was the overview of the relevant literature that contributed to this area of research. Conformity posited that individuals are likely to socially conform to the general other so as to not be excluded from the majority population. On the other hand, individuality posited that individuals are likely to voice their thoughts and opinions without fear of deviating from the majority. As well, individuals are driven to acquire many strong-tie and weak-tie relationships on social media to enhance their sense of belonging on these platforms. Lastly, individuals on social media are likely to employ self-presentation techniques in order to either fit in or stand out from the online majority.

Theoretical Frameworks

Social Conformity

The underlying assumptions to Asch's social conformity paradigm was that people may be easily suggestible to ideas and opinions without question or critique, regardless of the merit of those ideas and opinions, due to powerful social pressures (Asch, 1955). He focused on how individual opinions, and even personal values, may change without adequate knowledge or judgment on the subject matter (Asch, 1955). Furthermore, he wanted to explore the extent to which social influences were restricting and/or manipulating individuals' feelings and opinions during a time when technological advancements in communication were expanding (Asch, 1955). Asch's description of conformity, and his interest in its ties to technological communication, were parallel to the types of questions we were studying (Asch, 1955).

Social media is highly accessible and provides instant access to information; news can reach millions of people in a matter of minutes. As a result, various opinions and narratives can be created with little or false information simply due to online peer influence or influence from authority-related sources (Asch, 1955). Misinformation, polarization, and cyberbullying due to varying opinions have all been negative consequences stemming from the rise of social media. It has changed the way we communicate with others, how we receive our information, and thus, how we may form opinions. Asch (1955) expressed his concern over technological advancements in communication and how it played a role in the formation of individual opinion.

Asch's (1955) original work focused on authority figures and large groups of people and their impact on individuals' opinions. Specifically, he asked a group of people, primarily college students, to give their opinion on different subjects (Asch, 1955). He proceeded to ask the same participants their opinion again, however, the second time they were also provided false information about how other people responded (Asch, 1955). Specifically, they were provided manufactured responses from experts and a large group of their friends (Asch, 1955). After encountering false information about others' opinions, most students changed their initial opinion to fit more in line with their peers or authority figures (Asch, 1955).

Asch's social conformity was beneficial to our study because it took into consideration the role of perception (Asch, 1955). Specifically, how individuals perceive information that is believed to be coming from a group of peers or from someone who has authority, and how that affects their thinking and actions (Asch, 1955). This was a crucial aspect of our research topic because social media platforms are universal, and millions of people utilize them, including politicians, celebrities, and peer groups. If online information or trends are perceived to be acceptable among the majority or by someone in a position of power, then an individual may shift their ideas, perceptions, or opinions to fit the perceived norm (Asch, 1955).

Groupthink

The theory of groupthink was proposed by social psychologist Irving Janis after the 1986 Challenger disaster in which a space shuttle exploded after being launched due to poor decision-making amongst the commission in charge of its assessment and readiness (Janis, 2008). Groupthink can be understood as a "concurrence-seeking tendency" in which people aim for cohesion and unanimity amongst their in-group when making decisions and forming opinions (Janis, 2008, p. 237). A requirement of groupthink is the strong desire to maintain solidarity and relationships within one's in-group at all costs (Janis, 2008). While it can be argued that higher cohesiveness within a group can lead to higher efficacy in achieving common goals, Janis also argues that this determination to remain highly cohesive and unanimous can cause the individual members' mental processes to get stuck. In this way, groupthink can replace critical thinking and analysis (Janis, 2008).

There are 8 conditions that can signify that a group is experiencing a groupthink mentality (Janis, 2008). The first is the "Illusion of Invulnerability," in which a group's cohesiveness can make them feel "special" or invulnerable to bad outcomes (Janis, 2008, p. 238). "Belief in Inherent Morality of the Group," and "Collective Rationalization," are the second and third symptoms, which signify the assumed correctness of beliefs, actions, and decisions of the group (Janis, 2008, p. 239). The fourth is, “Out-group stereotypes,” in which the closely knit in-group displays a tendency to look down on outsiders in the group (Janis, 2008, p. 239). Symptoms five and six are “Self-Censorship,” and “Illusion of Unanimity,” which refer to group members censoring their opinions if they disagree or are unsure about the group’s decisions or opinions, and their assumed silence is interpreted as agreement resulting in the illusion of unanimity within the group (Janis, 2008, p. 239). The final two symptoms are, “Direct Pressure on Dissenters,” and “Self-Appointed Mindguards;” when essentially, dissenters are unwelcome and pressure is put on them to conform to the group’s decisions to prevent “troublesome ideas” from entering the group and disrupting harmony (Janis, 2008, p. 238-239).

Groupthink was relevant to our study of online social conformity as it helped describe the impact in-groups formed over social media platforms have on individual thought and opinion. Since social media allows for a wider outreach, it may be easier for many individuals to find groups they feel that they belong to; in finding these in-groups, they may experience groupthink and thus, conform to the groups' opinions, decisions, and behaviours. These online niches can display many of the symptoms of groupthink mentioned above, and throughout our paper, we draw upon this theory in our analysis of how and why social conformity is promoted online.

Labelling Theory

Labelling theory is a sociological theory relating to deviance within society (Plummer, 2001). While labelling theory can be tied back to Frank Tannenbaum in the early 20th century, the key labelling theorists during the rise of labelling theory in the 1960s were American sociologists Howard S. Becker and Edwin Lemert (Plummer, 2001). Labelling theory examines the effect of labels on promoting deviant behaviour and can also be viewed through the lens of how fear of being labelled may deter individuals from deviating in the first place. Becker insinuated that social groups tend to elicit deviance by making rules and labelling those who break the rules as “outsiders” (Becker, 1963, as cited in Plummer, 2001, p. 191). Further, he states, “deviance is not a quality of the act the person commits, but rather, a consequence of the application by others of rules and sanctions to an ‘offender’” (Becker, 1963, as cited in Plummer, 2001, p. 191). This understanding of labelling theory signifies how the impact of others’ rules, norms, and decisions can result in negative labels and stereotypes placed upon individuals, which can create further deviance.

Within our study, we utilized labelling theory to understand the impact that being labelled has on conformity, and whether those that are considered to be deviant would maintain their label or feel pressure to conform under scrutiny, to rid themselves of the label. Within the context of Becker & Lemert’s labelling theory, it is presumed that those who are deviant may continue to maintain that label whether they desire to or not, as seen within “cancel culture,” where people are essentially shunned online for their deviance regardless of showing a change in their opinions or actions that got them “cancelled” in the first place. Finally, and most importantly, labelling theory is relevant to our study’s broader focus on how social media promotes conformity and individuality, and whether there is more of a desire to be a “leader” or a “follower” online. Further, we examined the tendency to conform for the sake of avoiding labels in the first place, whether the labels in question have positive or negative connotations to them. For instance, the label of “leader” can be positive or negative, depending on how it is perceived and what kind of characteristics are attributed to being a “leader.” Some may refrain from resonating with the label of “leader” if they perceive it to be an egocentric, excessive label, whereas others may proudly consider themselves fit for a leadership title.

Attribution Theory

Attribution theory is not one single theory, but rather, a composition of multiple theories attempting to infer the cause of certain behaviours and whether they are more likely to be concerned with self-perception or other perceptions (Kelley & Michela, 1980). The study of attribution theory can be tied back to an experiment done by John Thibault & Henry Riecken in 1955 (Kelley & Michela, 1980). In this experiment, a subject interacted with both a person of higher status than them and a person of lower status. The goal of the interaction was to try to receive help from each person, and both the individual of higher status and lower status complied with the request for help. These two subjects were then asked why they decided to comply; was it due to internal or external pressures to assist the first subject? This study illuminated the idea of attributions for behaviours and actions and whether they are more likely to be attributed to situational or dispositional factors (Kelley & Michela, 1980). Dispositional attributions refer to internal reason and characteristics causing behaviour whereas situational attributions refer to external reason and situational factors causing behaviour (Clancy, 2020).

Attribution theory was relevant to our study as we aimed to figure out when social media elicits conformity and if this conformity is more likely to be attributed to situational/external pressure, or dispositional/internal factors. In terms of dispositional factors, we looked at how users are motivated to implement certain impression management techniques such as presenting either an actual-self or idealized-self on various social media platforms. As well, the venue of social media as a catalyst for cyberbullying may have been a primary situational factor that may have explained why users were wary to engage with it.

Dramaturgical Theory

Founded by Erving Goffman, dramaturgical theory refers to the idea that human interactions are much like a grand play (Kivisto & Pittman, 2007). Goffman (1959) was interested in analyzing the micro-level interactions between people through the lens of dramaturgy and suggested that people essentially treat their world like a stage (Kivisto & Pittman, 2007). Each individual is an actor and an audience member, in a sense; we are all actors on the stage of life and other individuals with whom we interact are our audience members (Kivisto & Pittman, 2007). In Goffman’s book, *The Presentation of Self in Everyday Life* (1959), he describes the “performance” that all individuals put on to the “audience” around them as a means of conveying their perception of reality outward and creating a “new reality” for the audience (Kivisto & Pittman, 2007, p. 298). Goffman argues that the idea of the “self” is merely formed from one’s performed character and does not exist outside of that character (Goffman, 1959, as cited in Kivisto & Pittman, 2007). This implies that individuals are not autonomous, and their character is always concerning their social sphere.

The concept of roles is important in Goffman’s dramaturgy; these roles are the reality and image that individuals want to convey as actors to their audience (Kivisto & Pittman, 2007). Moreover, there are distinct features in a play that can be applied to the performance of everyday life, according to Goffman. For instance, the division of stages in a play is applicable in this context (Kivisto & Pittman, 2007). There is a “front stage” and “backstage” in life just as there is in a play; the “front stage” is what is presented to the audience, depicting the reality the actor desires to display, whereas the “backstage” is where individual actors are free from the public eye (Kivisto & Pitman, 2007, p. 306). Goffman (1959, p. 113) states that a key characteristic of the backstage and its function is that it, “will be the place where the performer can reliably expect that no member of the audience will intrude.” For example, in houses, more private areas like bedrooms and bathrooms with locks can be viewed as “backstage” whereas public areas where others are meant to see you are considered “front stages” (Kivisto & Pittman, 2007).

In this way, dramaturgical theory shines a light on how appearances and the projection of the desired self publicly are ever-present in society through social media today. As Goffman (1959) compares everyday life to a performance on the stage that is the world, social media use can be seen through the lens of a stage in which “actors” post or interact with one another’s posts as performances delivered to audience members as well. The “front stage” can be seen as what is posted and intended to be viewed by followers, friends, and others (the audience), and “backstage” can be viewed as the individual actor’s life and interactions offline/behind the screen which few to no others see. Much like movies and plays have a “behind the scenes,” people can have a “behind the screens” reality. Thus, social media can be viewed as a tool that assists in putting on a show and enhances the actors’ ability to project their reality and desired selves to the world.

Summary of Theoretical Frameworks

The theoretical frameworks discussed provided fundamental knowledge to our research, allowing for a deeper analysis of our results and better understanding of the theories as they pertain to technological advancements. As these theories have existed long before the reign of social media, the applicability of them in such contexts is relevant and necessary. Asch’s social conformity laid the foundation for our research questions, and we were better able to understand and elaborate on the significance of his theory and findings in a more modern context. Within his work on social conformity, Asch alluded to technological advancements playing an important role in individual decisions to conform with majority opinion, and this was a key component in our study. Social conformity worked in tandem with Janis’ theory of groupthink. Asch’s (1955) focus on how environmental circumstances could alter the mindset of an individual, as opposed to solely focusing on in-person group pressures, was in line with our research inquiry as social media is usually an act that is partaken in alone, and therefore, pressure stemming from a physical group of people is technically non-existent (Asch, 1955, pp. 2-5). Although, social media can make an individual feel as though they are a part of a group, as you can experience the pressures of group dynamics online. Both groupthink theory and Asch’s (1955) conformity experiments focus on in-person group pressures and unanimity rule, however, Asch’s (1955) specific research aimed to explore “group pressure upon the minds of individuals” (Asch, 1955, p. 2). Janis’ groupthink outlined how social conformity can exist in group settings as a means of avoiding becoming a part of the “out-group” in such social contexts (Janis, 2008). These two frameworks were compatible with labelling theory as it pertains to our study. Labelling theory provided further insight into avoidance of the “out-group” by way of highlighting that an ostracizing label, like that of an “outsider,” is enough to affect one’s likelihood of deviating or conforming from majority opinions. We incorporated attribution theory as a means of explaining the factors, whether situational or dispositional, affecting conformity online. Finally, Goffman’s dramaturgy provided an excellent understanding and analogy of the presentation of self to broader society. The applicability of dramaturgy to online social settings assisted us in our description of why one might be more inclined to present a certain way online as compared to in-person. All five of the theories provided were essential to our discussion and interpretation of results.

Methodology

Development of Survey

The research methodology that this study will employ is a quantitative design that involves the use of an anonymous online survey on MREB-certified software called LimeSurvey. The research was approved by the McMaster Research Ethics Board (MREB#: 0327). This was a password-protected software that only the designers of a survey could access. No third-party users could gain access to the data or manipulate the survey design. The major advantage of using an anonymous survey was that participants were more likely to disclose sensitive information in an environment that does not link this information to any participant identity markers. As such, higher disclosure rates can be interpreted as the results being more accurate than a non-anonymous survey. Thus, this study employed the technique of quantitative analysis using LimeSurvey to conduct an online anonymous survey.

Ethical Concerns

Importantly, the study did include risks that may have deterred participants. However, the research posed no risks greater than those in everyday life. These included psychological and social risks. To begin, the psychological risks included potential feelings of discomfort, worry, and embarrassment when participants answered the questions during and/or after the survey. This may have been due to the survey questions invoking triggering thoughts or resurfacing past trauma that could have hindered the participant's ability to complete the survey. Next, the main social risks included loss of privacy, status, or reputation when participating in the research. In terms of loss of privacy, there was a chance that the participant may have been in a space with other non-participants who could have viewed the private survey responses on the participant’s device, which could have caused discomfort for the individual working through the survey. In terms of status and reputation, affiliations that the participant had with other people could have affected their current status and reputation, which may have hindered their relationships. This could lead to a negative change in reputation and status that the participant would have to experience. Thus, these were the primary risks that participants were informed of prior to the commencement of the survey.

We had put strategies in place to manage and minimize the potential risks to participants. In terms of psychological risks, participants could withdraw from the survey at any point in time before submitting. This allows the participant to exit the survey should they feel any discomfort or embarrassment while responding to the questions. Another way to alleviate psychological risks is by engaging with the supportive resources that were provided on a separate page once the survey has been submitted. This information was also included in the letter of information. This can allow the participant to speak with a mental health and wellness specialist to alleviate any negative feelings or emotions that may arise during the anonymous survey.

In addition to the psychological risks, there were some strategies to alleviate possible social risks associated with the study. The first strategy being implemented was that the survey is completely anonymous and online. As such, the results of the survey cannot connect any identity markers to the participants. The results were completely anonymous to the student investigators when data analysis was conducted. A measure that the research team had put into place for the study is that they had allowed participants to take the survey at the time and place of their choosing. Participants were encouraged to find a safe and private space that they deemed comfortable to take the survey at their leisure. This was to ensure that strangers and individuals they may know do not watch or judge the participants while they completed the survey, to minimize status or reputation harm. Thus, these are some measures that had been put into place by the research team to ensure participant safety, comfort, and privacy, which would have increased the likelihood of a well-rounded, successful experience.

Recruitment

There was one main recruitment strategy that we used to gain participants. The strategy involved reaching out to 44 McMaster Student Union-approved clubs and societies across campus. The 44 clubs included: Social Psychology Society, McMaster Geeks, Human Behaviour Society, McMaster Sociology Society, McMaster Humanities Society, McMaster Psychology, Neuroscience & Behaviour Society, Black Student Association, Muslim Students' Association, Health, Aging, and Society Student Association (HASSA), McMaster Society of Off-Campus Students (SOCS), MacHollywood, Girl Up McMaster, Women & Gender Equity Network (WGEN), McMaster Sports Community, McMaster Biology Society, McMaster BioPsych Society, McMaster Neuroscience Society, McMaster Sign Language Club, Filipino McMaster Student Association, Artists at McMaster, Bollywood at Mac, McMaster Anthropology Society, First Gen McMaster, McMaster Activist Theatre, McMaster Political Science Students Association, McMaster Debating Society, Social Work Student Collective, McMaster Economics Society, McMaster Golden Z, McMaster Social Science Society, ACE McMaster, COPE- A Mental Health Initiative, Humanity First McMaster, MacNutrition, Desi Students at McMaster, McMaster Japanese Connection, McMaster Egyptian Students Association, McMaster Indian Association, McMaster Iranian Student Association (MISA) McMaster Korean Pop Culture Club, McMaster Italian Cultural Club, McMaster Punjabi Association, McMaster Sikh Students Association, and the McMaster Vietnamese Students Association.

All student investigators were a part of the recruitment team. However, each investigator was assigned to recruit from clubs and societies that they had no relations with in order to reduce bias and conflict of interest. Afterwards, each member was tasked to email a list of specified clubs that we wished to reach out to, using one of our approved recruitment scripts alongside a supervisor-approved graphic. This was so that they broadcasted it on their social media pages, which would then attract undergraduate participants to voluntarily complete our survey. As well, the student investigators directly messaged all 44 clubs and societies on Instagram and Facebook using one of the approved recruitment scripts with the graphic and link attached to the message. Thus, emailing and direct messaging MSU-approved societies and clubs was our primary method for participant recruitment.

Survey Procedure

The next process of this study was for participants to voluntarily complete our online anonymous survey on LimeSurvey. The survey would seek to answer three research questions:

1. Does social media promote conformity?

2. Can social media also promote individuality?

3. Does the fear of being labelled affect self-expression?

Prior to starting the survey, the participant would have read the letter of information. The content included undergraduate student investigator details, principal investigator details, the purpose of the study and procedure involved in the research, potential harms, risks, and discomforts, potential benefits, confidentiality and the right to withdraw, and finally, information on how to obtain the study results. After reading the letter of information, the participant would then have to decide whether to agree to participate or not. By agreeing to participate and take part in the study, the participant provided their implied consent. The participant could then begin the survey. The survey contained 30 questions, 5 of which pertained to demographics, and the remaining 25 focused on the influence of conformity, individuality, and labelling when it comes to social media use. Most questions would employ a Likert scale ranging from most unlikely to most likely. The participant had the right to withdraw from the survey at any point up until submitting the survey and could skip any questions in the survey other than the consent page. Afterwards, a new page would appear at the end of the survey indicating that they are encouraged to reach out to the McMaster Student Wellness Centre if completing the survey made them uncomfortable and/or they want someone to talk to. Lastly, the participant may close the survey link and their device. This would mark the completion of the survey process.

Data Collection

In addition, the survey was opened from November 25th, 2022, and closed on February 17th, 2023. The participants were informed that the survey would take approximately 10-15 minutes to fully complete. It could be done at any time and location of their choosing, provided they had Internet access. The goal of the survey was to reach 75 participants to complete the survey. However, on the closing day, the survey consisted of 157 responses, 119 of which were partial responses and 38 fully completed responses on the survey. Once the survey had closed, it saved all the participant data securely. That marked the end of our data collection procedure.

Challenges to Data Collection

There were a few challenges in collecting data for our study. The first of these challenges was in participant recruitment through various McMaster clubs and societies.

Many of the clubs and societies we asked to advertise our survey on their social media accounts either declined to do so due to their policies against such advertisement on their social media platforms or did not respond altogether. This significantly reduced the number of participants we were able to gather. Furthermore, the handful of accounts that did agree to post may have audiences with certain demographics that skewed our survey results.

Time constraint was another issue we had encountered. The timeline of our research study spanned across two academic semesters only; because of this, we were not able to further research the causes and effects of our study in greater detail. Moreover, many of the groups that did decide to promote our survey responded to us within the last few weeks or so of our participant recruitment. We experienced a slow start to advertisement of our survey and, due to the already limited window of time we had for participant recruitment, did not have as much time for many students to engage with our survey. Our results will only encompass what we were able to gather and analyze over these months.

Another challenge we faced in our data collection was the number of incomplete surveys; out of 157 surveys, 119 were partial and 38 were complete. However, all 119 of the partially completed survey did not respond past the consent to participate. Moreover, 1 of the 38 complete surveys had inconclusive responses that we could not use in our research, leaving us with a total of 37 responses total.

Finally, despite curating a list of survey questions specifically pertaining to our study, we did not have control over whether the participants answered honestly. The chance of participants dishonest answers may unfortunately skew our results and the interpretation of them on a larger scale.

Data Analysis

Lastly, our quantitative data was analyzed using the Jamovi program and our qualitative data was analyzed using thematic analysis. To start, we utilized both descriptive and inferential statistics. The descriptive statistics described certain features of the data by generating a summary of the data set. In order to run a descriptive analysis on the data, every data variable had to be re-labelled with appropriate names for easy indication. Afterwards, the data had to be re-coded to allow for the inferential and descriptive statistics to be computed. Next, several related variables were computed in order to produce a mean between them. Finally, the mean data set had to be transformed to show the distinction between each response in the data set. Once these changes were made, descriptive analysis was conducted on all of the data variables. The analysis produced a numeric frequency table that displayed the quantity of each response set. Afterwards, inferential statistics was performed based on the descriptive analyses.

Inferential statistics helped us make inferences about our population through making predictions from our sample size and allowed us to arrive at a conclusion about our data. The main inferential statistics tests that were run included t-tests, correlation matrices and chi-squared statistics. Firstly, correlation matrices were run on certain variables that allowed us to indicate if a measure was statistically significant and if the correlation was positive or negative. The correlation matrices produced a table with the appropriate quantities to illustrate either a positive or negative correlation coefficient (r-value) and a p-value result, which noted if a value was less than .05 to be determined as statistically significant across the variables. Secondly, the t-tests informed our understanding of the data by comparing the means of two grouping variables. The analysis produced a detailed account of whether or not the results/difference were significant. Lastly, chi-squared analysis was conducted to illustrate if two variables in the data were statistically significant. The analysis produced a table that illustrated the differences between the expected and observed frequencies between variables as well as a p-value. Afterwards, the research team took these values and generated the quantitative formula that depicted the analysis. In doing so, these tests of significance provided a quantitative outlook in order to reach a conclusion about a correlation between our measures. Thus, Jamovi was used as our primary software to analyze the data that we collected.

Moreover, for the second research question, we conducted thematic analysis on three open-ended survey questions. The open-ended survey questions were questions 8, 11 and 17. For each question, we read each anonymous response and grouped them into themes based on a common pattern. Afterwards, we looked at the anonymous responses to see if the same individuals answered all three open-ended questions. It was discovered that of the 9 participants that answered the open-ended questions, 1 participant only answered one question, 4 participants answered 2 of the three open-ended questions and the remaining 4 completed all of them. Lastly, we created a table that highlighted the different themes for each question and the number of responses for each theme.

Therefore, the study used LimeSurvey to conduct an anonymous online survey. We recruited participants from 44 McMaster University clubs and societies to voluntarily do the survey. Once the survey closed, we analyzed the data using the Jamovi program and thematic analysis to interpret the results of our survey.

Results

Sociodemographics

Our study was composed of 37 McMaster University undergraduate students (n=37). The last 5 items in our survey were demographic questions that related to age, faculty, year of study, ethnicity, and gender. Of our 37 participants, 3 responded that they were 18 years old (8.6%), 10 were 19 years old (28.6%), 8 responded with 20 years old (22.9%), 12 responded with 21 years old (34.3%), 2 responded that they were 23 years old (5.7%), and 2 responded that they were 25+ (5.4%). Most of our participants were from the Faculty of Social Sciences, with 23 people having selected that response (62.2%); 6 participants were from the Faculty of Science (16.2%), 4 participants were from the Faculty of Humanities (10.8%), 1 participant was from the Faculty of Engineering (2.7%), 1 participant was from the Faculty of Health Sciences (2.7%), and finally, 2 participants preferred not to answer (5.4%). 11 of the participants were in their 2nd year (29.7%), 9 were in their 3rd year (24.3%), 9 were in their 4th year (24.3%), 4 were in their 1st year (10.8%), 2 were in their 5th year or higher (5.4%), and 2 participants preferred not to answer (5.4%).

For our last two demographic questions, we left them open-ended, whereby the participant was asked to type out the ethnicity and gender they identified with. For ethnic identities, 19 participants said they identified as White/Caucasian/European (51.3%), 7 participants identified as South Asian (18.9%), 3 participants responded East Asian/Southeast Asian (8.1%), 2 participants responded Middle Eastern (5.4%), 1 participant responded Black/African (2.7%), 1 participant responded Latinx (2.7%), 3 participants identified with more than one ethnicity (8.1%), and 1 participant preferred not to answer (2.7%). 28 of our participants self-identified as female (75.6%), 5 participants responded that they identified as male (13.5%), 2 participants identified as non-binary (5.4%), and 1 participant preferred not to answer (2.7%).

As previously mentioned in our challenges to data collection, we found that a lot of our demographic information was skewed or lacked plurality. It was not applicable to our findings on factors affecting social conformity, individuality, and the effect of labelling theory when using social media. While our demographic questions were included in our results to display the sample characteristics of our population, they were excluded from any discussion, as they lack relevance to our research questions.

Social Media Usage

We asked participants to select the number of hours they estimate that they spend on social media sites. The frequency table in Figure 1 illustrates that most people answered that they use social media for 3-4 hours a day, with 16 participants selecting that response (43.2%). 11 participants indicated they used social media for 5-6 hours a day (29.7%), 8 participants selected 1-2 hours a day (21.6%), 1 participant selected 7+ hours a day (2.7%), and finally, 1 participant answered that they use social media for less than an hour per day (2.7%). The results indicated that most participants use social media for more than 3 hours per day.

Figure 1

Frequency of Social Media Use

Frequency of Social Media Use	Counts	% of Total	Cumulative %
1-2 hours per day	8	21.6%	21.6%
3-4 hours per day	16	43.2%	64.9%
5-6 hours per day	11	29.7%	94.6%
7+ hours per day	1	2.7%	97.3%
Less than an hour per day	1	2.7%	100.0%

Does social media promote conformity?

Participants were asked to select how likely, or unlikely, they were to follow the online opinion of other users on social media platforms. In Figure 2, this frequency chart illustrated that the majority of participants were likely to follow the opinions of other users as 48.6% selected that option.

This correlation matrix (Figure 3) measures the correlation between time spent using social media and the likelihood of following online opinions. The p-value is greater than .05, and therefore, the correlation is statistically insignificant. This indicated that the time spent on social media did not affect the participant’s likelihood of following online opinions.

The bar plot in Figure 4 was created to describe two variables. The first variable asked participants if they had a desire to either fit in or stand out when in an in-person group setting. The second variable asked participants if this same desire existed when in an online group setting, with the response options being “yes,” “no,” “maybe,” and “other”. Results showed most participants answered “maybe” to their desire to fit in or stand out

Figure 2
Following Online Opinions

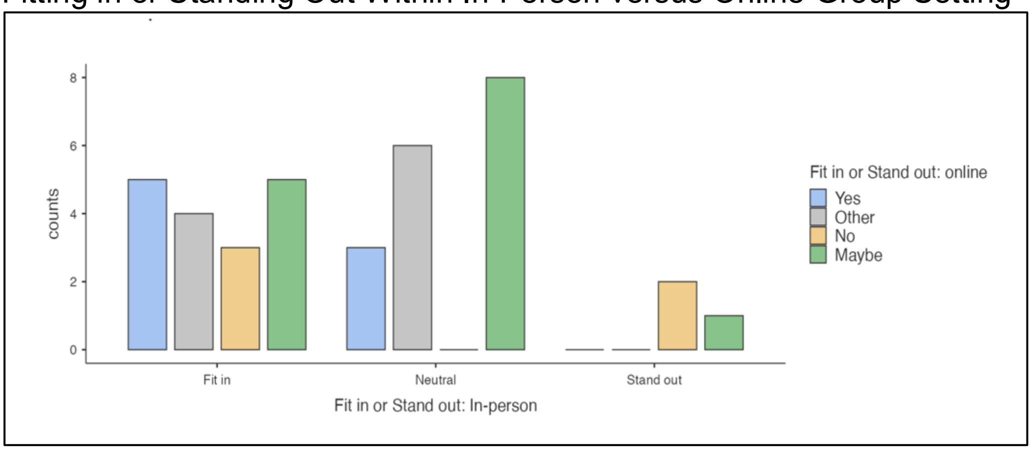
Recoded following online opinions	Counts	% of Total	Cumulative %
Likely	18	48.6%	48.6%
Unlikely	6	16.2%	64.9%
Very unlikely	6	16.2%	81.1%
Neutral	6	16.2%	97.3%
Very likely	1	2.7%	100.0%

Figure 3
Likelihood of Following Online Opinions

		Likelihood of Following Online Opinions	Frequency
Likelihood of Following Online Opinions	Pearson's r	—	
	p-value	—	
Frequency	Pearson's r	–0.136	—
	p-value	0.421	—

remaining the same both in-person and online. The bar plot displayed that the majority who were neutral to the idea of standing out or fitting in when in-person were indifferent to standing out or fitting in online. Further, results displayed that the majority of those who indicated a preference to fit in in-person also answered “yes” and “maybe” to having the same desire to fit in online. Finally, most of the participants who answered that they preferred to stand out in-person did not possess the same desire to stand out online.

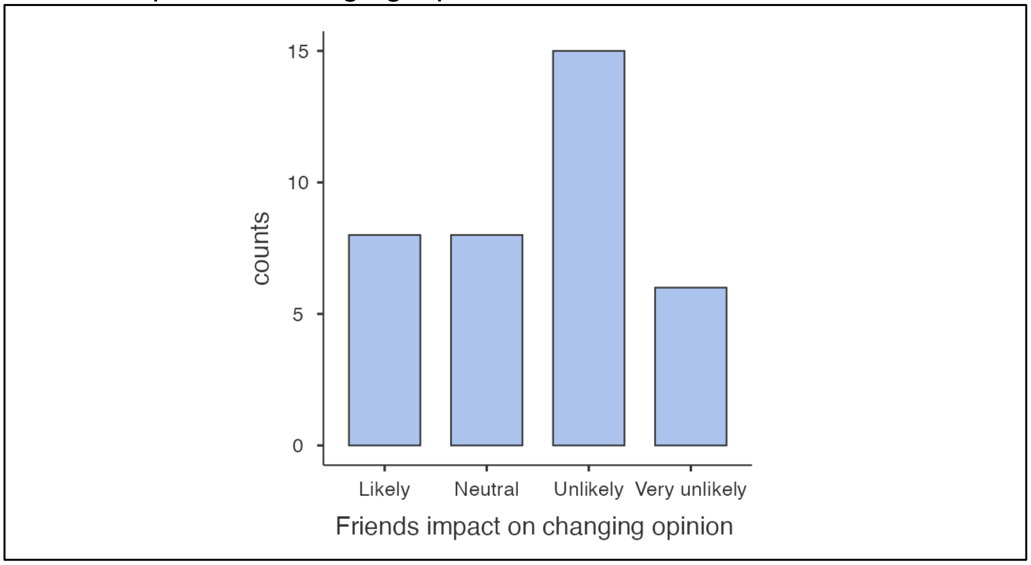
Figure 4
Fitting in or Standing Out Within In-Person versus Online Group Setting



Participants were asked how likely, or unlikely they were to change their opinion if a close friend or colleague commented on an opinion. In Figure 5, the bar plot illustrated that the majority indicated that they were unlikely to change their opinion as 40.5%

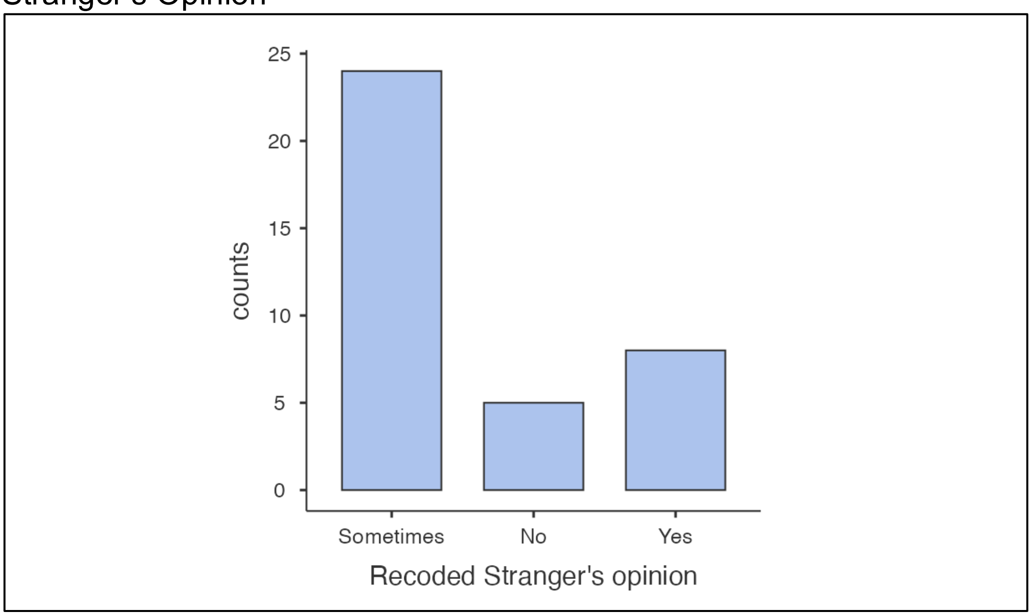
selected that option. This was followed by 21.6% of participants responding likely and neutral to changing their opinion.

Figure 5
Friends Impact on Changing Opinion



Participants were asked if they valued a stranger's opinion regardless of whether it was in-person or online interaction. The bar plot in Figure 6 showed that the majority of participants indicated that they would sometimes value the opinion of strangers, with 64.9% selecting it. This was followed by 21.6% of participants who answered 'yes' to valuing a stranger's opinion and only 13.5% indicated 'no' to valuing a stranger's opinion.

Figure 6
Stranger's Opinion



This correlation matrix in Figure 7 illustrated that the p-value was statistically insignificant, as $p = 0.934$ ($p > 0.05$). The correlation was positive and strong ($r = 0.014$).

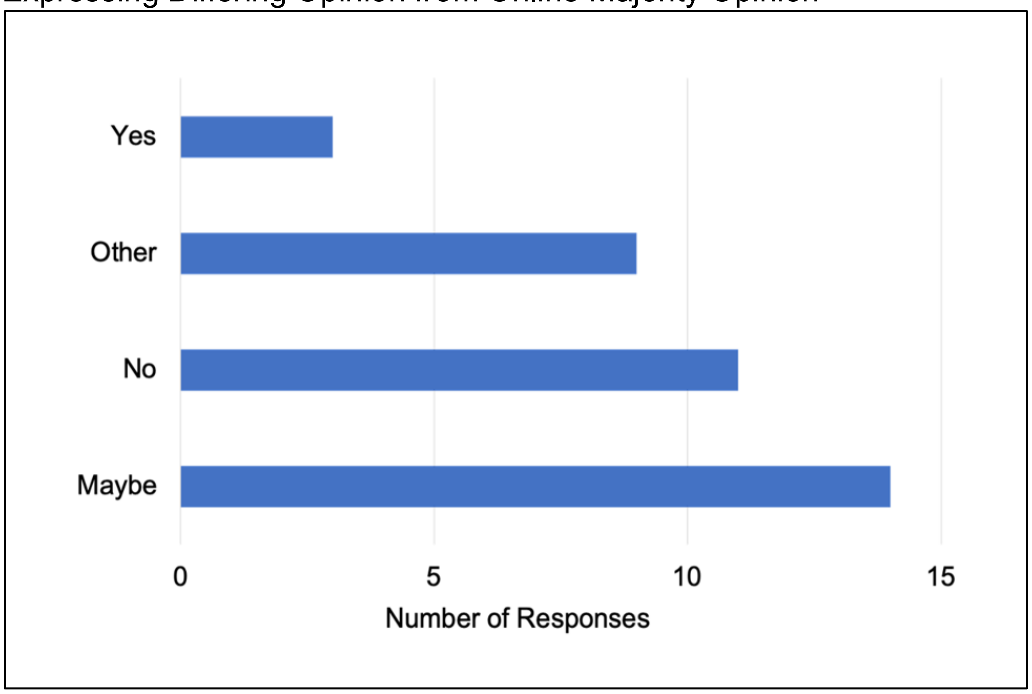
Figure 7
Fear of Being Cancelled Online

		Fear of being cancelled online	Blindly agreeing with an online trend 2
Fear of being cancelled online	Pearson's r	—	
	p-value	—	
Blindly agreeing with an online trend 2	Pearson's r	0.014	—
	p-value	0.934	—

Can social media also promote individuality?

In Figure 8, participants were asked if they would express an opinion that differs from the online majority opinion. This graph illustrated that 37.5% of participants were indifferent about expressing an opinion that differed from the online majority opinion. This was followed by 29.7% who indicated they would not express an opinion that differed from the majority. As well, 24.3% described other reasons for expressing a differing opinion from the majority. Lastly, 8.1% indicated they would express an opinion that differed from the online majority.

Figure 8
Expressing Differing Opinion from Online Majority Opinion



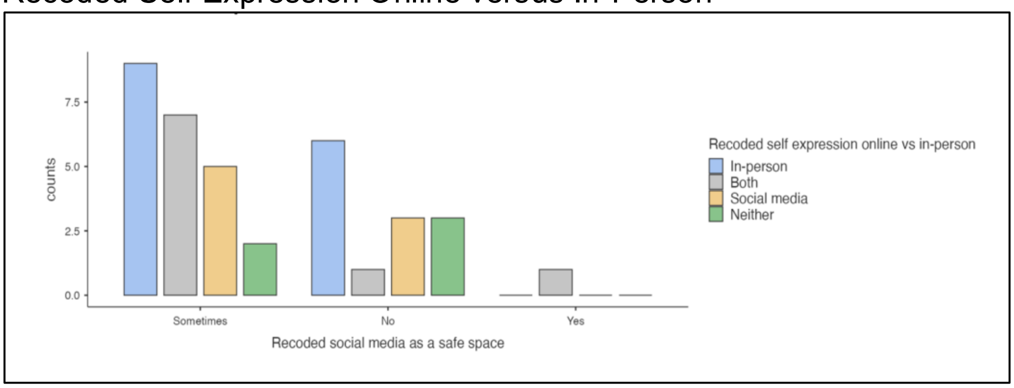
Participants were asked how likely they were to change their opinion after seeing another user's opinion on a post. This frequency chart (Figure 9) illustrated that 37.8% of participants noted that they were unlikely to change an online opinion that they held after witnessing another user's opinion online. This was followed by 35.1% who responded that they were likely to change their opinion and 21.6% who responded to being indifferent towards changing their opinion. Lastly, 2.7% of participants were both very likely and very unlikely to change their online opinion.

Figure 9
Likelihood to Change Online Opinion

Likelihood to change online opinion	Counts	% of Total	Cumulative %
Likely	13	35.1 %	35.1 %
Neutral	8	21.6 %	56.8 %
Unlikely	14	37.8 %	94.6 %
Very likely	1	2.7 %	97.3 %
Very unlikely	1	2.7 %	100.0 %

This bar plot in Figure 10 combined two variables. The first variable asked participants if they viewed social media as a safe space to share a thought. The second variable asked participants which way they preferred to freely express their thoughts. This bar plot showcased that the majority of participants selected that they sometimes perceived social media to be a safe space. Of those participants, 24.3% indicated they were more likely to freely express their opinion in person. In addition, 16.2% of participants who did not feel that social media was a safe space were likely to express themselves in person as well. There were very limited responses for the option that regarded social media as a safe space. Only 2.7% who indicated social media was a safe space were also likely to express themselves in both options and there was 0% for in-person, social media and neither.

Figure 10
Recoded Self Expression Online versus In-Person



The chart of qualitative data (Figure 11) reported 3 notable themes pertaining to self-expressing oneself if they held a different opinion from the online majority.

In Figure 12, the chart of qualitative data reported 3 notable themes pertaining to whether a participant felt comfortable aligning themselves as either fitting in or standing out when in an online group setting.

Figure 11
Survey Question 8: Would you express (in the form of a post or comment) an opinion that differs from the online majority opinion? [Other]

Theme	Responses (n=9)
1. Not worth the time (don't care about it) 2. Don't want to share personal information/matter 3. Quality over quantity (my opinion matters more than what the majority think)	1. N = 4 (44.4%) 2. N = 3 (33.3%) 3. N = 2 (22.2%)

Figure 12
Survey Question 11: Based on your response to the last question, does this same desire exist when in ONLINE group settings? [Other]

Theme	Responses
1. Likes to stand out and express opinion 2. Uses it for entertainment 3. Keeping opinion to oneself	1. N = 6 (66.7%) 2. N = 1 (11.1%) 3. N = 2 (22.2%)

This chart of qualitative data in Figure 13 reported 1 notable theme when participants were instructed to describe a past moment where they held a different online opinion from the majority and their feelings behind it.

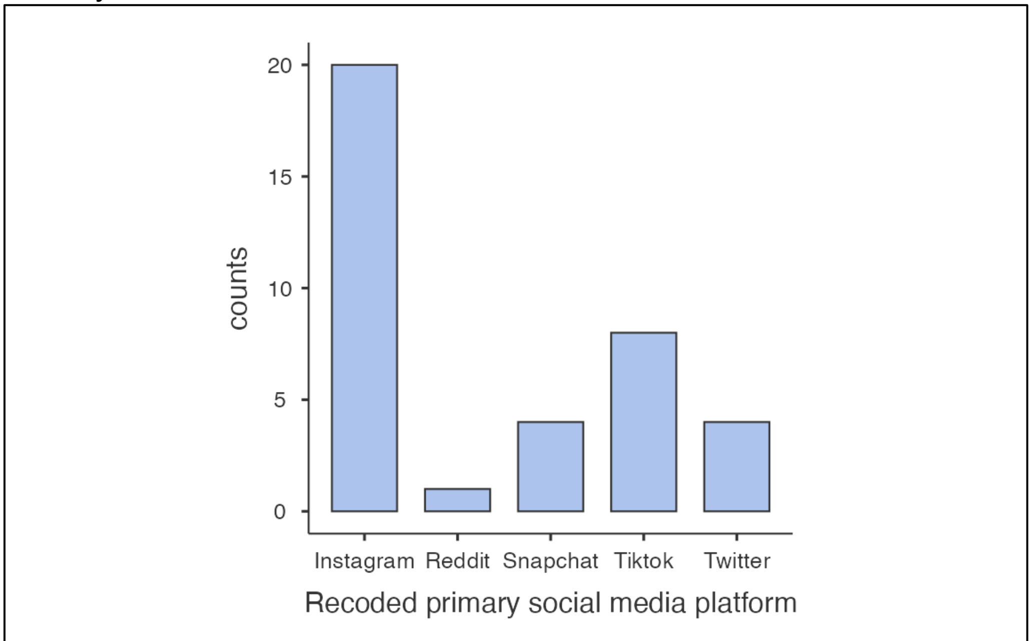
Figure 13
Survey Question 17: Has there been a moment in the past, online, where you had a different opinion from the majority? [Other]

Theme	Responses
1. Yes (held a different opinion from the majority in domains like jokes, opinions on LGBTQ, Chinese politics, Johnny Depp trial, and fake news)	1. N = 9 (100.0%)

Does a fear of being labelled affect self-expression?

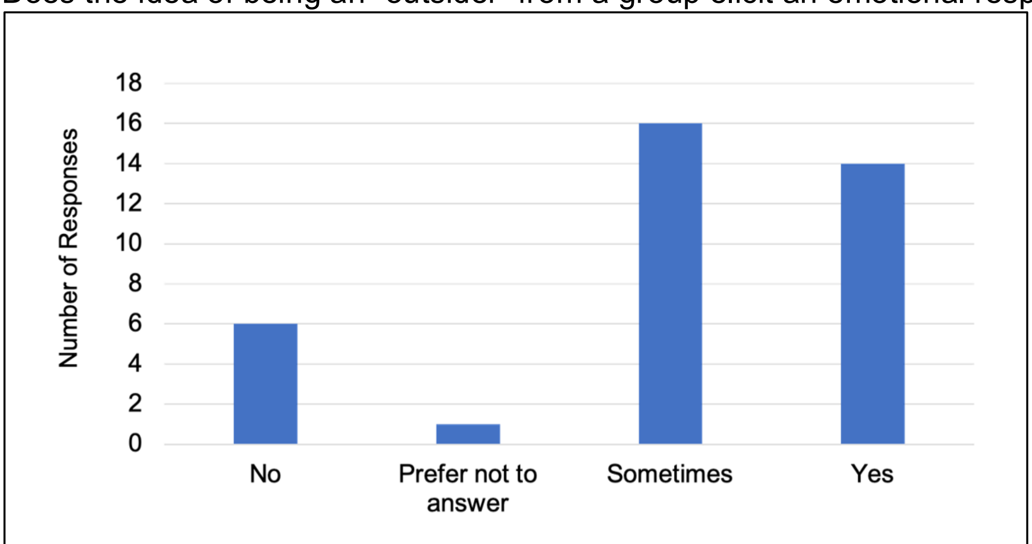
This bar graph (Figure 14) illustrated the question of which social media platforms participants used primarily. It was found that 54.1% of participants used Instagram as their primary social media platform. This was followed by 21.6% who used TikTok, 10.8% who used Snapchat and Twitter, and lastly, 8.1% used Reddit as their primary social media platform. The bar graph indicated that the majority of participants favoured Instagram.

Figure 14
Primary Social Media Platform



This bar graph in Figure 15 indicated that 43.2% of participants reported that they sometimes experienced an emotional response when faced with the idea of being an "outsider". This was followed by 37.8% of participants that indicated that they experienced an emotional response and 16.2% indicated they did not experience an emotional response. Lastly, 2.7% indicated that they prefer not to answer the question.

Figure 15
Does the idea of being an "outsider" from a group elicit an emotional response?



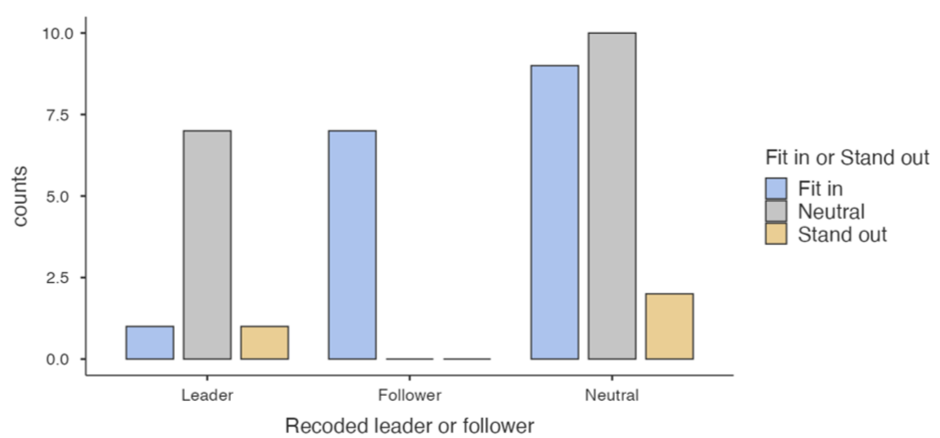
Participants were asked to select the option of leader or follower that best describes them. In Figure 16, this frequency chart indicated that the majority of participants chose neutral as 56.8% selected this option. As well, 24.3% chose leader and 18.9% chose follower.

Figure 16
Leader or Follower

Recoded leader or follower	Counts	% of Total	Cumulative %
Leader	9	24.3%	24.3%
Follower	7	18.9%	43.2%
Neutral	21	56.8%	100.0%

This bar plot (Figure 17) combined two variables. The first variable asked participants to select which label of “leader” or “follower” best described them as a person. The second variable asked participants whether they more closely align with a desire to either fit in or stand out. The bar plot indicated that 18.9% of participants that selected the “follower” label had a desire to fit in and 18.9% of participants that selected the “leader” label was neutral in terms of fitting in or standing out. Also, 24.3% of participants that selected neither “leader” or “follower” had a desire to fit in, while 27% that selected neither label was also neutral in terms of fitting in or standing out.

Figure 17
Fitting In or Standing Out as a Leader or a Follower



In Figure 18, this t-test was conducted between two variables, specifically frequency of social media use and whether being labelled an “outsider” from a group elicited an emotional response. It suggested that the correlation was statistically significant with $p < 0.001$ for the first variable. As well, a p-value of 0.017 for the second variable showcased statistical significance. Therefore, emotional response and frequency do influence each other.

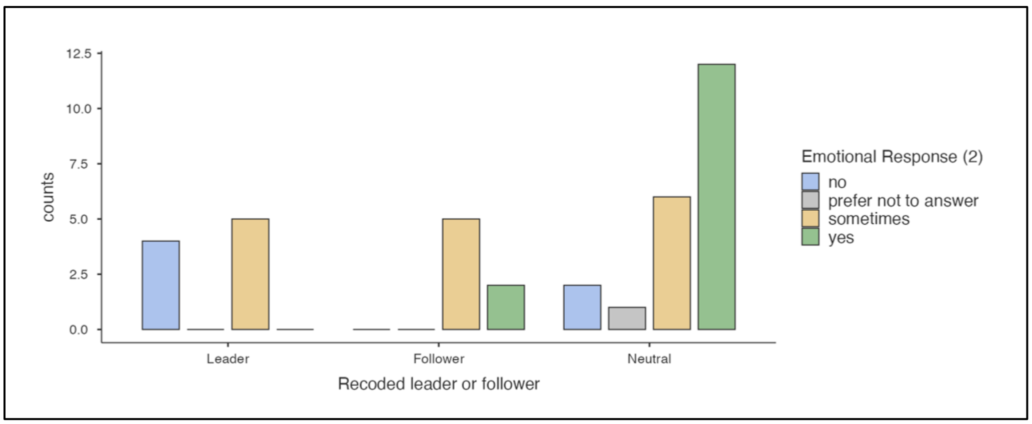
Figure 18
The Frequent Use of Social Media and Emotional Response When Labelled “Outsider”

		Statistic		**df**	**p**
Frequency	Student's t	4.12		35.0	< .001
Emotional response	Student's t	2.51	a	35.0	0.017

Note. H_a $\mu_{Dom} \neq \mu_{Intl}$
[a] Levene's test is significant ($p < .05$), suggesting a violation of the assumption of equal variances

This bar plot in Figure 19 combined two variables. The first variable asked participants to select which option best described them as a person. The second variable asked participants if the idea of being labelled as an “outsider” could elicit an emotional response. For example, the bar plot indicated that 32.4% of participants that chose the “neutral” label had an emotional response to the “outsider” label and 16.2% of participants that selected the “neutral” label sometimes had an emotional response to the label of an “outsider”.

Figure 19
Being Described as a Leader or Follower and Emotional Response When Labelled “Outsider”



Discussion

Research Question 1: Does social media promote conformity?

Frequency of social media use and conformity.

To begin, we took into consideration whether frequency of social media use significantly impacted the likelihood of social conformity online. A study by Floros and Siomos (2014) applied the Five Factor Model (FFM) to measure patterns between excessive internet use and scores of the different personality traits depicted in this model. According to this study, excessive internet use is connected to higher scores of traits like neuroticism and lower extraversion (Floros & Siomos, 2014). From these results, it can be extrapolated that individuals higher in neuroticism experience greater levels of anxiety and lower self-esteem or confidence. In the same way, those with lower scores in extraversion are less likely to “take center stage” or partake in self-expression (Floros & Siomos, 2014, p. 21).

It should be noted, however, that in their analysis, Floros & Siomos discuss how excessive internet use also results in low scores in traits like conscientiousness and agreeableness. This can potentially counter the effects of high neuroticism and low extraversion, as those who score low in conscientiousness and agreeableness are less motivated by societal expectations and may lack regard for falling in line with the norm (Floros & Siomos, 2014).

Taking all of this into consideration, we measured the possibility of a correlation between the two variables. From our understanding, it would make sense that the more time an individual spends on social media, the more likely they are to engage and align with majority opinions they see online as their neuroticism and extraversion is likely impacted by heavy internet use.

Our results indicated that most participants used social media for 3 or more hours a day, with the highest response being 3–4 hours per day, and the second highest being 5–6 hours per day. While it can be subjective what constitutes “excessive” social media use, as some may perceive 3 hours as average while others may perceive it as immoderate, we considered these on the moderate-to-higher end of social media use given the scale of our options which are shown in Figure 1. We then looked at the survey item that measured participants’ likelihood of conforming with an online opinion; almost half of our participants (48.6%) indicated that they were likely to follow along with other users’ opinions on social media platforms (see Figure 2). Inputting these two variables into a correlation matrix yielded results that were statistically insignificant, indicating that the amount of time spent on social media did not affect the participant’s likelihood of following online opinions. This was contrary to what we would expect and could be due to a few of the limitations noted further on in our research paper. Linking this back to the article by Floros & Siomos (2014), it could also be the case that the respondents who do excessively use social media may have low scores in conscientiousness and agreeableness that counter the effects of social media lowering extraversion and increasing neuroticism. That is to say, perhaps these participants who spent a lot of time on social media may use it frequently, but more passively, to where they do not necessarily self-express, but they do not significantly experience the need to conform.

Ultimately, the time spent on social media appears not to be a high predictor of social conformity in our study. Putting together the two variables of frequency of social media use and likelihood of following an opinion online yielded insignificant results in our attempt to answer whether or not social media promotes conformity.

In-person vs. online social conformity.

Within our survey, we asked participants if they aligned more with the desire to “fit in” or “stand out” for both in-person and online contexts and put together the responses for each question in a descriptive bar plot (see Figure 4). Most of the results are evidently neutral and did not allow for a direct answer as to whether social media platforms cultivated conformity more than in-person settings. However, based on the fact that all of the respondents who indicated that they preferred to stand out in-person said either “no” or “maybe” to having the same desire to stand out online, one can infer that it is considered more intimidating to stand out online than it is in-person. We conducted a test of significance of these two variables in our survey, however, the results yielded statistical insignificance ($p > 0.60$). This suggested that the desire to fit in and stand out, either in-person or online, may be independent of one another. Despite this, we extrapolated that none of the participants who felt confident and comfortable standing out in-person felt that same comfortability or confidence to stand out online.

We further investigated the difference in willingness to conform when interacting with users online as compared to when around friends or peers that the person is familiar with. Referring back to Figure 2, 46.8% of the participants stated that they would likely follow the opinion of other social media users. However, 40.5% of participants stated that they would be unlikely to change their opinion if they were to see that their friends had a different opinion on a post (see Figure 5). Figure 6 asked participants if they would value a stranger's opinion regardless of if it was in person or online, to which 64.9% of participants stated that they would value a stranger's opinion sometimes, followed by 21.6% who answered yes. Furthermore, 37.5% of participants stated that they would maybe express an opinion that was in contrast to the majority opinion followed by 29.7% that said they would not express an opinion that went against the majority opinion (see Figure 8).

This would suggest that social media users highly value strangers’ opinions and are more willing to conform to anonymous social media users rather than members of their own social network. Participants’ indecisiveness in whether they would express an opinion that differs from the majority showcases the complexity of online interactions.

Through the use of Goffman’s dramaturgical theory (1959), we can begin to understand how and why participants would choose to take on the opinion of a stranger as opposed to an opinion from someone close to them. Goffman suggested that individuals treat their world like a stage, where the individual is an actor performing their perception of reality to an audience, ultimately creating a “new reality” for their audience (Kivisto & Pittman, 2007, p. 298). In this case, the participants can be seen as actors performing on virtual stages to a virtual audience that is comprised of peers and anonymous social media users (Kivisto & Pittman, 2007, p. 298). Goffman further argued that the individual “self” is merely a character that is constructed and portrayed during interactions, and that the self does not exist once the performance is over (Kivisto & Pittman, 2007).

This could suggest that participants construct and portray an online persona or self on social media, however, the character may only exist while the participants are online, and they may perform different characters for different audiences in various settings (Kivisto & Pittman, 2007). Goffman coined the term “front stage” to depict the reality an individual wants to display to their audience whereas “backstage” refers to when the individual is not in character or performing and is away from their audience (Kivisto & Pittman, 2007, p. 306).

Figure 7 indicated that users who followed online trends that they did not agree with more often were influenced by the fear of being “cancelled” online. Participants’ willingness to change their opinions to fit strangers’ opinions online could be attributed to Goffman’s “front stage” theory as participants may be attempting to portray a different character or reality to their virtual audience (Kivisto & Pittman, 2007). By changing their opinion, they are essentially conforming to the reality of other social media users despite whether they truly believe in that reality (Kivisto & Pittman, 2007). This is in line with Asch's discourse on social conformity and how individuals are swayed by information with a lack of personal understanding and knowledge of the matter at hand (Asch, 1955). By conforming to strangers' opinions online, they can avoid conflict, create a socially acceptable image of themselves, and can leave the discussion without any consequences or repercussions. Furthermore, when they go "backstage" or offline and away from the public eye, they can continue to hold their true opinions without any repercussions and without their anonymous social media audience knowing (Kivisto & Pittman, 2007). "Front stage", in a sense, could be an impression management strategy and safety tool that participants utilize to avoid being cyber bullied or attacked online (Kivisto & Pittman, 2007). Political divisiveness and cancel culture can make the virtual environment on social media platforms extremely hostile, and potentially life altering, as one comment or share that does not align with majority opinion can ruin an individual's life. This could potentially lead to a virtual environment where users feel forced or are coerced into playing a character that does not align with their personal, or backstage self, to remain safe (Kivisto & Pittman, 2007).

Since participants stated that they are likely to follow the opinion of an anonymous social media user or users as opposed to their social network, this could also be attributed to "backstage" behaviour as individuals are more likely to show their authentic self, and remain true to their authentic selves, when they feel safe or are in close relationships (Kivisto & Pittman, 2007). Friendship or close relationships, in this sense, may elicit authentic behaviours because individuals do not feel like they must put on a performance when they are in the company of close friends or close relationships (Kivisto & Pittman, 2007).

Groupthink, on the other hand, plays a more complex role on social media as anonymous online groups, and their influence, could impact conforming behaviours (Janis, 2008). Because most participants were willing to follow the opinion of a stranger online, this could suggest that they would most likely follow the opinion of a virtual "in-group" as they may encounter and feel the impact of in-group pressures online (Janis, 2008). Furthermore, the symptoms of groupthink "Belief in Inherent Morality of the Group" and "Collective Rationalization", which assume that a group's beliefs, ideas, and decisions are correct, could be a reason as to why 37.5% of participants stated that they would be indifferent in expressing an opinion that goes against the majority opinion followed by 29.7% who said they would not (Janis, 2008; See Figure 8). Participants may be under the false pretense that the opinions of virtual "in-groups" must be correct, especially if the opinion being stated is an opinion that is held by most group members (Janis, 2008). In online settings especially, it is easier to witness the masses following an opinion or political stance. The majority can look like an intimidatingly large "in-group," and thus, groupthink could apply in such a context.

Furthermore, the participants who said they would not express an opinion that differs from the majority may also fall victim to "Self-Censorship" where their silence is mistaken for agreement (Janis, 2008). Therefore, participants may feel obligated to follow or remain silent, so they do not disrupt the cohesiveness of the "in group" and risk potentially being seen as a member of the "out-group" (Janis, 2008). By conforming, participants can avoid being seen as a member of the out-group to the online community and thus avoid the stereotypes and labels that may come with that association (Janis, 2008).

Research Question 2: Can social media also promote individuality?

Social media appears less likely to promote individuality than conformity.

Based on the descriptive statistics, the overall results indicated that social media may not appear to promote individuality or self-expression. According to Figure 9, participants noted that they are unlikely to change their opinion after witnessing another user's online opinion. This suggested that participants are reluctant to change their opinion despite knowing that a particular opinion is being hailed by the majority. This illustrates that one's individuality is still maintained by the user to some degree. However, it doesn't show expression of individuality because witnessing one user's opinion on a post is not enough for another user to warrant a change in their opinion unless every single user under a post comments on the same opinion. Despite these results, previous research suggested that the theory of the spiral of silence informed the fear that users had when going against the majority online opinion (Lee & Chun, 2016). It seemed that users on social media tended to not convey their own opinion when they believed that not everyone held the same opinion as them (Hampton et al., 2014).

On the other hand, according to Figure 8, most of the participants indicated that they were indifferent about expressing an opinion that differed from the online majority. As well, 29.7% of participants indicated that they would not express a different opinion. This suggested that although they would not change their opinion after seeing another user's post, they would not express an opinion that differed from the majority. This feeling can be attributed to dispositional factors. One dispositional factor that can be attributed to the participants may be that some experience rejection sensitivity (Downey & Feldman, 1996). Those that are high in rejection sensitivity try to avoid situations that may put them at risk of rejection (Downey & Feldman, 1996). This means that social media is not an appropriate ground to safely express one's opinion due to a perceived fear of rejection from others. In fact, in Figure 10, only 2.7% of participants indicated that they believed social media was a safe place. Because of the safety surrounding social media, participants perceive it as an unsafe space to voice an opinion. This is a situational factor that affects self-expression. One reason for this perception is that social media is a prime venue for cyberbullying (Whittaker & Kowalski, 2015). Witnessing aggressive online comments on social media can lead to cyberbullying victimization which in turn can influence how users perceive social media as a place of self-expression (Whittaker & Kowalski, 2015).

The overall theme of the thematic analysis suggested that there are contradictions between the three variables. One of the main themes of the analysis between Figure 11 and Figure 13 suggested that all participants stated they held a different opinion from the online majority, but most were reluctant to voice it on social media. All of the participants held a different opinion from the majority on a wide range of topics such as humour, politics, LGBTQ+ issues, and fake news. With this in mind, one might expect that these participants would freely express themselves online. However, this was not the case as suggested by the analysis. We found that 44% of participants did not care to express their opinions and that they did not want to share any personal opinions. Only 22% of participants indicated that their opinion mattered the most out of the majority. One reason for this hesitancy could be attributed to groupthink.

Participants may have been motivated to want to maintain an online solidarity between users in order to achieve a common goal of being relatable (Janis, 2008). This motivation is likely to be maintained to avoid being a victim of cyberbullying, in which the user is likely to be subjected to ridicule for their deviated opinion (Whittaker & Kowalski, 2015). Another reason for this hesitancy could be attributed to participants being motivated to present a carefully curated online identity. In this case, participants who indicated that they held a different opinion from the majority were demonstrating an actual-self identity (Johnson & Ranzini, 2018). Users who demonstrated an actual-self identity online were being their true self and demonstrating their actual opinion on a range of topics including controversial ones such as LGBTQ+ issues. On the other hand, participants who indicated that they were reluctant to express a different opinion from the online majority were expressing an ideal-motivated self-identity (Johnson & Ranzini, 2018). These participants were not truthful of their identity online and, instead, employed impression management techniques to create a carefully constructed image to be portrayed online (Johnson & Ranzini, 2018). Despite them holding a different opinion from the majority, they were not inclined to share that deviating opinion with other users which resulted in participants being less likely to display their true selves online.

Users who are motivated to present an ideal-self on social media do so in order to seek belongingness from the in-group and voice a similar opinion that the majority held (Johnson & Ranzini, 2018). Lastly, participants may have exercised dramaturgical theory (Goffman, 1959). In this case, participants were presenting a “backstage” that consisted of differing opinions on common topics (Goffman, 1959). However, when it came time to express those opinions to other users in the form of a post or comment, many were reluctant to do so. This indicated that participants needed to preserve their “front stage” appearance so as to not let their audience be aware of their true opinion and character, which could compromise how their audience sees them (Goffman, 1959). This suggests that users are not free to act in autonomous ways and that their actions are guided by their social spheres. This showcased that users are forced to act and speak in ways that socially benefit them but have minimal intrinsic benefit. Thus, with the help of previous literature and theory, they help shed light on the reasons why participants held a different opinion from the majority but did not express it online.

Moreover, another general theme that came from the thematic analysis between Figure 11 and Figure 12 was that 66.6% of participants stated that they wanted to stand out and express their opinion when placed in an online group setting. This suggested that the majority of participants wanted to be true to themselves and have their opinions heard by other people. This is related to the theory of individuality, which looks at how individuals are able to freely express themselves without conforming to others. By being true to oneself, users feel better psychologically, emotionally and feel less pressured to engage with social media norms (Bailey et al., 2020). As well, the desire to maintain this fake idealized self online can cause an inner conflict within a user since that is not their authentic identity (Bailey et al., 2020). The inner conflict could be expressed through frustration, negative affect, and overall decreased well-being (Bailey et al., 2020). This sheds light on the reason why most of the participants indicated that they wanted to stand out in online group settings and voice their true opinions.

Although most participants indicated they wanted to stand out and freely express themselves, only 22% of participants said they would express an opinion that differed from the majority. This shows that participants wanted to remain their authentic self but at the same time, did not want to deviate from the majority. One reason for this inconsistency lies in the maintenance of one's self-presentation. Trieu and Baym (2020) found that users who had a high following consisting of weak-tie relations were more likely to carefully curate posts, comments and content that did not express their authentic views. However, users who shared posts, content, and comments with a small group of users who they had strong ties with were more likely to express themselves authentically without the fear of deviating from the online social norms (Trieu & Baym, 2020).

When in an intimate group of strong-tie relationships, an individual is more likely to express their thoughts without the fear of being criticized. This broadly suggests that social media may not be a space for promoting individuality because users are not able to freely express themselves without fear. Even though participants want to stand out and be their authentic self, they are cautious and particular about their presentation to their large following of weak-tie relationships. Thus, social media does promote individuality at a very surface level that consists of sharing some aspects of themselves online but still hiding particular views that deviate from the majority online opinion.

Research Question 3: Does a fear of being labelled affect self-expression?
Labels prevent self-expression online

Our results suggested that a fear of being labelled by others prevented participants from engaging in self-expression online. These findings were consistent throughout the quantitative data and statistical tests conducted pertaining to our third research question: "does a fear of being labelled affect self-expression?" Figure 14 displayed a bar graph that pertained to the primary social media platform of participants, which was very telling, as the majority of individuals (54.1%) reported Instagram as having been their main social media app of choice.

Past literature has discussed how, within this highly visual, photo-based platform, users engaged in meticulous management of their presentation of self, so as to have increased the likelihood of approval from fellow users (Yau & Reich, 2018). In order to avoid negative self-presentations, users engaged with sites like Instagram in ways that allowed them to "appear interesting", "appear likeable", and "appear attractive" (Yau & Reich, 2018, pp. 201-202). They were deeply concerned with how the virtual audience perceived them, which led to attempts to display themselves in a favourable manner and avoid negative consequences such as labelling (Yau & Reich, 2018). The term "appear" (Yau & Reich, 2018, pp. 201-202) implied that these presentations of self were not wholly accurate or representative of one's true self, which confirmed our research question that individuals would not fully express themselves, as a preventative measure against labelling.

This finding effectively set the stage for our additional results, which can be supported by labelling theory (Becker, 1963). By assessing how common Instagram was among our participants and understanding the lack of authentic self-expression that past research examined on this social media platform, a groundwork was laid as to why our findings suggested a hesitancy to self-express out of a fear of labelling.

Figure 15 displayed the responses of participants when asked about whether being associated with the label of "outsider" elicited an emotional response. Notably, 43.2% answered "sometimes" and 37.8% answered "yes" (see Figure 15). When these two responses were combined, that meant 81% of those who responded to the question either at times or for certain experienced an emotional response to being considered an outsider, which was quite a significant finding.

Becker (1963) examined how individuals who defied norms and rules were often labelled as “outsiders”, a label with historically negative connotations. Our findings in Figure 15 showed that simply having read this loaded label resulted in a response that signified discomfort and unease with the label. Perhaps our respondents were exhibiting an awareness of “out-group stereotypes” that arise when in-group members engage in negatively perceiving those deemed to be outsiders (Janis, 2008). A large percentage of our survey participants reported responding emotionally to this label of “outsider”, as previously mentioned, which suggested a commonly held belief that failure to conform to in-group behaviours and norms signified a form of deviance (Becker, 1963). This was an important question to ask participants, as it explained why many displayed a tendency to engage with social media in a way that favoured conformity over self-expression, in an effort to minimize negative emotional responses to labels that were othering.

When asked about more closely identifying with the label of “leader” or “follower”, Figure 16 interestingly reflected that the majority of respondents (56.8%) selected “neutral” instead. Initially, we were unsure of how to effectively analyze this finding, as participants seemingly avoided associating themselves with either label. However, providing them with a neutral option proved to be quite telling, as it was apparent that most were drawn to the idea of not running the risk of being attached to either “leader” or “follower”, out of fear of how this sign of self-expression would be perceived by others.

As previously mentioned in regard to labelling theory (Becker, 1963), a major element of the fear that comes with being associated with a particular label are the negative or positive connotations attached to it. For instance, Hoption et al. (2012) elaborated on the negative connotations tied to the label of “follower”. They noted that those who were given this label by either others or oneself were discovered to experience diminished positive affect due to harmful stereotypes of being considered a follower, such as lack of strength and abilities (Hoption et al., 2012). Similarly, Chua and Murray (2015) discussed negative connotations associated with the “leader” label, which could have contributed to our participants shying away from it. They described “the toxic leader” as a narcissistic, power-hungry individual, resulting in an environment of toxicity around them (Chua & Murray, 2015, pp. 293-294).

Our findings, in conjunction with past research on this subject matter, could be interpreted as individuals opting to reject both labels and, instead, favoured neutrality, in order to protect their self-image and sacrifice self-expression, in our context, within social media settings. This finding was also made clear after examining Figure 17. This bar plot presented a combination of variables, including one’s tendency to align with the label of either “leader” or “follower”, and their desire to stand out or fit in. These results were closely related to Figure 16, in that most respondents who considered themselves “neutral” when it came to associating with one of the two labels were also inclined to describe themselves as wanting to fit in (24.3%) or remained neutral (27%), far more than standing out. Seemingly motivated by self-presentation and an avoidance of being negatively labelled by others, these participants who rejected both labels entirely also displayed a desire to conform as opposed to engaging in self-expression.

In order to present oneself to the masses in ways that did not garner negative, unwanted attention or judgment, these findings suggested that while on social media platforms such as Instagram, these individuals would closely monitor their self-presentation as a means of fitting in with their peers (Yau & Reich, 2018). Instead of prioritizing the expression of one's authentic, unfiltered self, participants seemingly wanted to be perceived by their peers as norm-abiding through the maintenance of a "favourable image" (Yau & Reich, 2018, p. 196).

After conducting a t-test to compare the two variables of frequency of social media use and emotional response to an "outsider" label (see Figure 18), statistical significance was revealed ($p < .05$), which meant that both variables influenced one another. This made clear that there was a relationship between one's usage of social media platforms and their tendency to express an emotional response to being labelled an "outsider". This was consistent with research findings within existing literature, specifically as it pertained to "excessive Internet use (EIU)" and personality traits of individuals (Floros & Siomos, 2014, p. 19). Those who recorded greater levels of EIU were found to score higher in neuroticism, which involved poor regulation of emotions, worsened self-esteem, and anxiousness, in addition to being lower in extraversion, common in those who avoided self-expression, displayed passiveness, and disliked attention (Floros & Siomos, 2014).

Our survey results could also be correlated with the findings of Abi-Jaoude et al. (2020), which suggested that social media use can be considered excessive and problematic when over two hours per day are spent on these platforms. According to our participants' responses, 43.2% reported three to four hours of use each day, 29.7% reported five to six hours each day, and 2.7% indicated over seven hours of use per day (see Figure 1). When combined, this meant that 75.6% of respondents utilized social media sites for more than two hours daily, which has been deemed excessive. The relationship between the variables displayed in Figure 18 not only represented statistical significance, but also shed light on the connection between the majority of our respondents' frequent use of social media and their emotional responses to being perceived as an "outsider". As detailed in the work of Floros and Siomos (2014), this could have been tied to the personality traits of our participants who accessed social media platforms frequently, as a lack of self-esteem, feelings of anxiety, avoidance of self-expression, and discomfort associated with receiving attention go hand-in-hand with a fear of being negatively labelled (Becker, 1963).

Finally, Figure 19 assessed the variable of individuals identifying more closely with the label of "leader" or "follower" and whether being labelled as an "outsider" elicited an emotional response. Figure 19 displayed the quantitative data in a bar plot. A chi-square test was then conducted combining the same variables as in Figure 19. It noted that X^2 (6) = 15.2, $p > 0.019$. This meant that the p-value was indicative of statistical significance, which suggested that these two categorical variables were dependent, with a relationship existing between them. Once the presence of a relationship was solidified following testing, perhaps the most intriguing discovery here was the connection between those who remained neutral when given the option of "leader" versus "follower" and their tendency to experience an emotional response when the prospect of being given the label of "outsider" arose.

Figure 19, as well as the chi-square test, made it clear that 32.4% of respondents who aligned themselves with neither label and opted for neutrality, indicated "yes" in regard to emotional response. Additionally, 16.2% of survey participants who selected "neutral" also indicated "sometimes" in regard to emotional response. Together, this accounted for 48.6% of respondents, nearly half of all responses, which was quite a significant result. In accordance with labelling theory (Becker, 1963) and past research on the negative connotations associated with particular labels (Chua & Murray, 2015; Hoption et al., 2012), our findings suggested that individuals who avoided the labels of “leader” or “follower” entirely were also more commonly found to have reported an emotional response to being associated with an “outsider” label. The relationship between these two variables signified to us an overwhelming sense of fear and discomfort when confronted with the possibility of being harshly labelled (Becker, 1963).

Therefore, in an effort to maintain in-group status, as proposed by Irving Janis (2008), our participants may have engaged in “Self-Censorship” (p. 239) through a censoring of their authentic feelings towards the labels of “leader” and “follower”, as most remained neutral due to negative societal attitudes towards both (Chua & Murray, 2015; Hoption et al., 2012). Within a social media context, this emotional response to being perceived as an “outsider” may have been attributed to a fear of being “cancelled” online (see Figure 7), resulting in further labelling, backlash, and potential relegation to the out-group (Janis, 2008).

Broader Significance of the Research

As social psychologist Solomon E. Asch posited: “we should be concerned with studying the ways in which human beings form their opinions and the role that social conditions play” (Asch, 1955, p. 31). Our research assessed the factors that affect the formation and expression of opinions in an online setting. As social media use increases, so does the amount of social conditions placed on self-expression. Identifying these more recent social conditions can help to frame how individuals interact with their online social worlds in modern society. This research can contribute to the future literature on the social psychological processes surrounding conformity and individuality.

Conclusion

Summary of Findings

Upon analyzing our results, the conclusion we have come to for our first research question is that social media appears to promote social conformity to some degree. To answer our first research question on whether social media tends to promote conformity, we considered time spent using social media and how this factors into social conformity online specifically. Further, we measured social conformity both online and in-person, to get an idea of whether participants were more inclined to conform in one setting compared to the other. Our findings also indicated that social conformity online was not necessarily dependent upon the opinions of those that the participants knew personally. On the contrary, we found that a stranger’s online opinion was considerably valued and ultimately, people cared what strangers thought about them online which was enough to elicit social conformity.

Likewise, social media promoted individuality to some degree. Most participants stated they held a different opinion from the majority, but most were reluctant to voice it on social media. Users self-express on a range of topics at a very surface level due to the fear of receiving criticisms from the online majority. It appeared that participants employed self-presentation techniques to help construct a specific online identity that allowed them to self-express to a small, intimate group as opposed to a majority that consisted of strangers. This suggests that participants do not have autonomy over their online identity.

They are constantly working to curate a specific image of themselves to present without it causing a psychological conflict.

Finally, the results and findings associated with our third research question made clear that individuals displayed a tendency to avoid engaging in means of self-expression that would cause them to be negatively labelled. The mere threat of being labelled or deemed an "outsider" by members of the online majority resulted in a tendency to shy away from expressing oneself authentically within these settings. The negative connotations associated with certain labels caused many participants to avoid them entirely. This fear of being tied to a label that threatened the maintenance of a positive self-image often elicited an emotional response. In sum, the prospect of being labelled prevented many individuals from exhibiting a real, unfiltered presentation of the self.

Limitations

While our study presented important findings that may be used to support current and future research on the topic of social media use, limitations were made clear. There were three primary limitations to our research, including a lack of generalizability due to skewed sociodemographic variables, small sample size, and the impact of potential biases.

Due to our sampling method being convenience sampling, our data lacks replicability, as our already small sample size was considerably skewed in terms of diversity in survey responses. For example, the results of our demographic survey questions revealed that the vast majority of participants self-identified as female (75.6%), meaning that our findings would not be representative of the thoughts and opinions of other gender identities. Also, most participants reported having been from the Faculty of Social Sciences (62.2%), which reflected a further lack of diversity. Additionally, due to the nature of the study and its involvement of solely undergraduate students who attended McMaster University, our survey findings were skewed towards the experiences of young adult social media users, which meant that we dealt with a highly specific demographic that, again, would not be representative of the general population.

Having such a small sample size meant that the results were inevitably going to be skewed due to such limited responses and little demographic diversity, which made it challenging to ensure that our findings were both reliable and valid. Initially, we sought to reach at least 75 survey participants, but in the end, our sample size unfortunately did not meet this goal, which proved to be another major limitation. Our low sample size also became difficult when we worked through data analysis and assessed potential correlations between variables. Because of the small number of participants, it was challenging having to distinguish between true findings and effects, and relationships that presented themselves as a result of chance.

Our final limitation dealt with the impact of bias that potentially came into play when our participants were completing the survey. An example of this is moderacy bias, when participants favoured midpoints of scales or leaned more towards neutral responses as a way of avoiding extremes, possibly displaying a lack of opinion. After assessing the results of our survey questions, many respondents displayed a tendency to select answers such as "maybe", "sometimes", and "neutral", which may have been a sign of moderacy bias in effect, offering too many response options, or flawed wording of our questions that led individuals to answer more moderately as a result of indecision, for instance.

Lastly, social desirability bias could also have played a role in how participants formulated their responses, further skewing the results. In an effort to respond to survey questions in a more socially acceptable, appropriate manner, our respondents may have fallen victim to this bias. If this was the case, this would have posed a threat to the validity of our findings, as well as harmed the integrity and accuracy of our results. We are committed to learning from these limitations and will continually work to address them in our future research endeavours.

Significant Insights and Contributions

In regard to significant insights that our research has provided, a major aspect would be the ability to better grasp the complexities and intricacies of social media that the typical user may have failed to consider. More specifically, through an analysis of individuals' social media use, we were able to correlate these findings with their tendency to either conform online or not. The concepts of social conformity and individuality are both highly relevant within the area of social psychology, so our findings will allow for further insights to be made within this research area, particularly pertaining to online behaviour and interactions.

Considering the incredibly widespread nature of social media use among young adults today, we believe our findings will contribute to societal understandings of this increasingly relevant form of media and its potential effects on users, both from a short-term and long-term perspective. These insightful findings added to existing research on these social psychological themes. In an increasingly digital world, it is essential that we commit to understanding the serious impact that usage of these platforms is having on peoples' ways of thinking, attitudes, behaviour, and opinions. Overall, we are confident that our study has offered useful insights into this subject matter and future research to come.

Final Thoughts

To conclude, it is hoped that this research will expand upon the existing breadth of literature on the role of social media and its impact on individuals' behaviours and emotions. This may be in terms of forming preconceived opinions, following trends, as well as engaging with popular posts and the reasons behind doing so. Although the sample population is not generalizable to the broader population, our area of research can provide valuable insight into how young adults respond to the content displayed on their social media platforms and how likely they are to implement online habits into their daily lives. We hope that our research can provide a clear picture of the ways in which young adults are generally affected by this media that they consume, in terms of socially conforming or embracing individuality.

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MUJSP

Comparing the Psychological Well-being of International and Domestic Students

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Abstract

Post-secondary students are an at-risk category in need of immediate assistance, as previous research indicates that they experience high levels of both stress and negative emotions in addition to having poor physical and mental well-being. Many post-secondary institutions now focus on addressing the needs of their students to better assist, support, and improve their psychological well-being. Considering that international students make up a significant and growing portion of the McMaster community, it is crucial to provide adequate support to better address the needs of this student population. The intention of this paper is to explore and compare the psychological well-being of international students and domestic students. We focused on three different dimensions of psychological well-being as they pertain to each participant. These dimensions include the following: help-seeking behaviour, social support, and relatedness. Using survey research, we utilized quantitative data and qualitative accounts to gauge how the unique experiences of each student group would account for variations in the three key dimensions. Our findings reveal that domestic students had access to more sources of support and higher knowledge regarding help-seeking resources, but, their psychological well-being was slightly lower than that of international students. This research serves as a foundation for understanding the complexity of group-specific student needs. Findings relevant to each dimension can be used to inform university initiatives that cater to mental health needs.

Introduction

We conducted a comparative study on the overall psychological well-being of international and domestic undergraduate students at McMaster University. This study was completed as a thesis project for the Honours Social Psychology Program at McMaster University. Our research team was composed of five undergraduate Honours Social Psychology students (three international students and two domestic students) under the supervision of Dr. Sarah Clancy.

Social Psychological Context

Improving the mental health status of students has become a primary concern for many higher education institutions considering the ongoing mental health crises and the increasing demands for resources. This process is further complicated by the growth in

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the number of students coming in from abroad. According to Rosa et al., (2021), the number of international students in Canada increased by 115% between 2010 and 2017. International students are naturally faced with stressors involved with acclimating to a new location such as feeling unstable and the loss of social support. They are also likely to experience additional barriers to accessing mental health care due to factors such as a lack of knowledge of resources and potential cultural gaps (Rosa et al., 2021). We recognize that international and domestic students come from diverse backgrounds and acknowledge that psychological well-being correlates with one's life satisfaction. As such, our research aims to examine and compare the positive psychological well-being of international students and domestic students as it pertains to their social support network and sense of belongingness within the McMaster community. By comparing the well-being of domestic and international students, we can evaluate the limitations of the current services offered in university settings and provide insight on how to better the system overall for both domestic and international students to develop more accessible, inclusive mental health services.

Problem and Purpose of Research

The intention of this paper is to explore and compare the psychological well-being of international and domestic students. We have done this by focusing on three different dimensions of psychological well-being as they pertain to each participant. We will be referring to psychological well-being as overall well-being with the goal of minimizing any potential psychological and social risks. These dimensions include the following: help-seeking behavior, social support, and relatedness. Domestic and international students have different lived experiences which may influence these dimensions, consequently impacting their psychological well-being in distinct ways. Gaining a more comprehensive understanding of this comparison will allow for greater acknowledgement and a wider range of perspectives to be considered when analyzing the psychological well-being of university-level students. This deeper level of understanding can help influence or shape university policies to improve the support it provides to both international and domestic students along the three dimensions discussed. By the end of this paper, we will be able to clearly identify the level of psychological well-being in international and domestic students and analyze the different factors that may influence the discrepancies or similarities that we find.

Overview of Paper

We will review the existing literature on international and domestic students' well-being and then discuss Social Identity Theory which we have operationalized as the theoretical framework for this study. In this section, we will explore the dimensions used in our study and provide an overview of the theory. We will go on to provide a step-by-step outline of the methodology we used in obtaining the data. Furthermore, we will outline our qualitative and quantitative results and explore them in our discussion section. Finally, we will conclude by addressing the limitations of our research project and significant insights found throughout our research.

Literature Review

Current academic literature demonstrates that post-secondary students experience a high degree of stress, negative affect, and poor overall well-being, making them an at-risk group in need of urgent intervention (Linden & Stuart, 2020). Poor psychological well-being is associated with a range of psychological and behavioral consequences such as low academic performance, substance abuse, and social isolation (Linden & Stuart, 2020). Each year, universities located in the Western world receive increasing numbers of international students (Rosa et al., 2021). For instance, Rosa et al., (2021) report that between 2010 and 2017, Canadian educational institutions received close to 500,000 foreign students. Naturally, studies assessing the psychological well-being of postsecondary populations must consider the unique factors that influence international students to account for the groups' health promotion.

Acculturation

Acculturation, the process of learning and adopting the norms of the dominant culture, is one such factor that uniquely affects the psychological well-being of foreign students (Rosa et al., 2021). Indeed, the stress from adapting to a new environment can create significant impacts on general functioning, negatively affecting both mental and physical health. Acculturative stress can be characterized by feelings of isolation, homesickness and overall unhappiness (Rosa et al., 2021). Owing to cultural differences and ignorance, international students are less likely to seek out the mental health resources available on campus (Rosa et al., 2021). Even if they do commence a course of treatment or intervention, they are less likely to follow through with it (Rosa et al., 2021). In their study, Rosa et al., (2021) sought to compare the physical activity rates of international and domestic students. They hypothesized that low physical activity was associated with low emotional well-being and higher stress (Rosa et al., 2021). Interestingly, stress levels alone did not significantly predict physical activity or emotional well-being for international students (Rosa et al., 2021). In other words, lower stress was not directly correlated with higher physical activity or better emotional well-being. Aside from this caveat, Rosa et al., (2021) conclude that lower physical activity correlates with lower emotional well-being, and this pattern was more pronounced for international students.

Skromanis et al., (2018) examined students' well-being by assessing their help-seeking behaviours, life satisfaction, availability of social support, and engagement in health-threatening activities. In addition to these dimensions, the authors investigated student ratings of their own physical and mental health. Results of the study indicate that, compared to domestic students, international students report lower levels of overall life satisfaction, lower levels of perceived social support, greater dissatisfaction with their living conditions, and higher engagement in health-threatening behaviours such as smoking and gambling (Skromanis et al., 2018). Furthermore, results indicated that international students were less likely than domestic students to seek assistance for issues associated with mental health, echoing the findings of Rosa et al., (2021). The researchers also found a sex-based difference in their pattern of results. Female international students were more likely to engage in help-seeking behaviour for mental health concerns compared to male international students (Skromanis et al., 2018). However, when it came to seeking assistance for relationship issues, drug/alcohol problems, money issues, or gambling issues, there were no differences between male and female international students (Skromanis et al., 2018). Skromanis et al., (2018) argue that this sex-based difference makes international male students even more susceptible to psychosocial issues induced by acculturative and postsecondary stress. The intersection of acculturative status, postsecondary student status and gender appears to create unique difficulties for this at-risk group, thus creating the need for more specialized interventions.

Social Group Identification

Creating a social context for meaningful cross-cultural interaction between international and domestic students and increasing a sense of belongingness has become a primary concern for institutions as research has found that international post-secondary students tend to have unsatisfactory social experiences (Glass & Westmont, 2014). Furthermore, belongingness - conceptualized as feelings of connectedness to the university, the existence of a "social support network, and a balance of academic challenge and support" - appears to be a major contributor to academic success regardless of student status (p. 106). For this reason, Glass & Westmont (2014) aimed to examine the moderating effects of the feelings of belongingness and how these would affect cross-cultural interaction; therefore, impacting the academic success of students. The authors also sought to compare how such effects may differ between international and domestic students.

Data was collected from eight US universities through the usage of the Global Perspective Inventory (GPI) (Glass & Westmont, 2014). Students were assessed on sense of belongingness, "academic success, cross-cultural interaction, and [related] risk factors (e.g. discrimination, financial [issues]), protective factors (e.g. meaning in life)," and promotive factors (e.g. positive affect) (Glass & Westmont, 2014, p. 116). Other than experiences of discrimination due to cultural or ethnic background, there were no significant differences in feelings of belongingness, self-reported academic success, or engagement in co-curricular activities between student groups overall (Glass & Westmont, 2014). However, the authors did note that activities run by the international students' own cultural heritage were lacking (Glass & Westmont, 2014).

While a sense of belonging significantly impacted the academic performance and cross-cultural interaction of international and domestic students, the effect size was much greater for international students (Glass & Westmont, 2014). Similarly, the perception of diversity acceptance at their institution was crucial to a positive sense of belongingness for both student groups but demonstrated a more significant impact on international students (Glass & Westmont, 2014). This pattern may be explained by the greater amount of discrimination experienced by international students (Glass & Westmont, 2014).

In sum, this study emphasized the importance of a sense of belongingness for academic success in both groups, but highlighted the ways in which connectedness may be of particular importance for international students' motivation and social relationships (Glass & Westmont, 2014). In a similar fashion, Brunstig et al., (2021) find that international students' adjustment depends on the social support they receive from domestic students and their faculty. Obtaining social support from faculty and domestic peers is necessary to establish a sense of connectedness and belongingness with their institution; challenges to obtaining such support can have aversive consequences for the psychological well-being of international students (Brunstig et al., 2021).

Psychological Well-being

King et al., (2021), in their study, compared the psychological well-being and academic outcomes of international and domestic students at two time points. At the beginning and end of the academic year, psychological well-being and associated risk factors were assessed, while academic outcomes were sourced from university databases (King et al., 2021). Contrary to previously outlined findings, King et al., (2021) report that domestic and international students experienced comparable levels of poor well-being. Specifically, the study showed an overall decline in mental health by the end of the school year, regardless of student status (King et al., 2021). A gender effect was also found; female domestic students reported the highest levels of anxiety, depression and insomnia at both time points of the survey while female international students reported the highest levels of self-harm and suicide attempts (King et al., 2021).

While the negative effects of risk factors on academic performance were significant in both groups, international students fared lower in overall academic performance. Both groups also faced similar levels of barriers to university mental health support (King et al., 2021). The existence and development of mental illness symptoms among international students were lower or similar to that of domestic students, which contrasts existing research stating that they experience increased barriers to healthcare (King et al., 2021). This may be explained by differing levels of stigma and mental health literacy, resulting in a reluctance to report or lack of awareness of mental health problems among the student population (King et al., 2021). However, international students reported lower levels of school connectedness and academic performance, potentially due to challenges associated with adapting to a new culture and education system (King et al., 2021).

In sum, this study demonstrates that international and domestic postsecondary students experience comparable levels of poor well-being but differ in terms of symptom presentation, academic performance and community connectedness (King et al., 2021). Clough et al. (2018) report a similar trend in their study. While international and domestic students experienced identical levels of psychological distress, international students fare lower in mental health literacy and help-seeking intentions when compared to their domestic peers (Clough et al., 2018). Mental health literacy and help-seeking intentions were particularly limited for suicidal ideation among international students (Clough et al., 2018). While both groups experience considerable distress, specialized intervention pertaining to group-specific risk factors must be implemented as mental health symptoms present in different ways for each group.

Taking a different angle, Chai et al., (2012) compare the use of religion and spirituality between domestic and international students as a coping mechanism for stress. They found that ethnicity, rather than student status, predicted religious/spiritual coping (Chai et al., 2012). Specifically, Asian students were more likely than their European peers to use religion as a coping strategy for stress and distress (Chai et al., 2012). Using religious coping strategies also proved to be more effective for Asian students, as it effectively enhanced their psychological well-being and life satisfaction (Chai et al., 2012). The authors conclude that this effect represents the role of culture in determining students' overall well-being (Chai et al., 2012). Owing to the relative emphasis of spirituality and religion within Asian cultures, alignment with religious/spiritual ideologies can provide individuals with a sense of cultural affiliation and belongingness with their racial and ethnic group (Chai et al., 2012).

Summary of Literature Review

The studies outlined thus far demonstrate some of the group-based challenges that international and domestic postsecondary students face in the Western world. Some trends that are visible among international students include lower help-seeking behaviors for mental health crises and lower mental health literacy (Beks et al., 2018, Clough et al., 2018). Limited research also suggests that international students who are male experience greater risk of suicide ideation compared to their domestic and female peers (Skromanis et al., 2018). While these findings lay a commendable foundation for research assessing psychological well-being and student status, it does little to address student bodies as a whole. Acculturation, stigma, cultural relevance and expectations are some of the factors that make existing psychological health care inaccessible to international students (Minutillo et al., 2020). To address these deficits, we aim to conduct a comparative study on the psychological well-being of international and domestic students enrolled in McMaster University. Our research goal is to address psychological well-being in terms of Social Identity Theory as culture, relatedness and related social factors appear to play an important role in maintaining positive well-being. Research on student dimensions of well-being such as school relatedness and willingness to participate in class and university life remain limited. This research also aims to build on existing literature and push for mental health literacy that addresses group-specific needs within the Canadian context.

Theoretical Framework: Social Identity Theory

Outline of Theory

The theoretical framework we are using for our research project is Social Identity Theory (SIT). SIT was developed by Tajfel (1978) and Tajfel & Turner (1979) to understand individual self-identification within groups, and intergroup conflict (Islam, 2014). SIT theorizes that people develop a social identity based on the groups that they identify with which, in turn, provides them with a sense of belonging (Islam, 2014). Based on this, in-groups (us) and out-groups (them) are formed which can then lead to stereotyping and prejudice (Islam, 2014). Tajfel & Turner (1979) identified three processes in identifying whether someone is part of the in-group or out-group: (1) categorization, (2) social identification, and (3) social comparison. Categorization refers to the process of organizing people into social groups to make sense of our social environment and where we fit in with those around us (Tajfel & Turner, 1979). Social identification is when we take on the identity of the group to which we belong, and social comparison is when we compare our group to other groups (Tajfel & Turner, 1979). For our positive self-identity to be maintained we must see our own group more favorably than other groups, but this may lead to prejudice towards the out-group (Islam, 2014).

Connection to Research

Social Identity Theory is relevant to our research because it states that positive self-image, and by extension positive psychological well-being, is a direct result of inclusion within a group (Kernis & Paradise, 2002). Therefore, our research questions primarily focus on three dimensions that seek to answer how socially connected our participants are. These dimensions are (1) Relatedness, (2) Social Support, and (3) Help-Seeking Behavior. We acknowledge that these three dimensions do not cover the entire scope of psychological well-being, with the structural constraints in mind; therefore, our research is limited but it provides some insight into the differences and similarities in psychological well-being between international and domestic students.

Relatedness

Relatedness refers to the need to feel a sense of belonging and connection with other people (Ryan & Deci, 2000). It is part of Self-Determination Theory which states that the three innate psychological needs are relatedness, autonomy, and competence (Deci & Ryan, 2012). We chose relatedness as our first dimension of measuring psychological well-being because it is a strong measure of social connectedness as it touches upon how people relate to each other and how meaningfully connected a person is to the social world around them (Deci & Ryan, 2000). Using the SIT framework, we analyze the correlation between relatedness and psychological well-being in international and domestic students. According to SIT, high relatedness is correlated with better psychological well-being because the sense of belonging created by inclusion is associated with better self-image and overall esteem (Islam, 2014). Conversely, lower relatedness is correlated with worse psychological well-being because exclusion and experiences of prejudice are associated with worse self-image (Islam, 2014).

Social Support

Social Support refers to the group of people that a person feels like they can rely on when they need help or emotional support (Cunningham & Barbee, 2000). There are three levels of social support networks: (1) macro, which includes institutions and informal contacts, (2) mezzo, which refers to the quality of the relationships in a person’s life, and (3) micro, which refers to the specific qualities of the most important relationships in a person’s life (Cunningham & Barbee, 2000). In our research, we are focusing on the macro and mezzo levels because they are most relevant to our study as they address social groups and how comfortable a person is with those in their life. The micro level is less relevant because we are not studying the specific qualities of one relationship in a person’s life but rather their overall social support networks. We chose social support as a dimension because it looks at peoples’ relationships and whether they feel generally supported both emotionally and tangibly. We have operationalized the SIT framework to analyze the correlation between social support and psychological well-being. Although the SIT framework does not touch directly upon social support, we argue that it is fair to extrapolate that students who identify with one or more groups likely have stronger social support networks than those who do not. Therefore, we use the SIT framework to analyze this dimension in regard to psychological well-being.

Help-Seeking Behaviors

Our third dimension, help-seeking behaviors, looks to explore whether undergraduate students at McMaster feel able to seek help from on-campus resources. Barriers to accessing resources include, but are not limited to: lack of knowledge, lack of connectedness with the overall community, the gap between person-resource fit, language barriers, social barriers, and stigma (Rosa et al., 2021). Student patterns of help-seeking behaviors can indicate how socially connected they are to McMaster University, and consequently their overall well-being. Whether students are accessing these services or not may indicate to us how socially connected they are to McMaster and Hamilton in general. Furthermore, if students are accessing support that may also be indicative of their psychological well-being. In line with SIT, concepts such as prejudice and discrimination, which are consistent with out-group denomination, may be used to explain the relationship between help-seeking behaviors and psychological well-being. If a student feels part of the out-group, they may not feel able to access on-campus resources because they may not feel as though the services are relevant or helpful to them.

Summary of Theory

Social Identity Theory argues that when we identify with an in-group, we develop a sense of social belonging and this improves our positive self-identity which is associated with improved psychological well-being. Therefore, we have operationalized SIT to apply to our research dimensions: relatedness, social support, and help seeking behaviors.

Methodology

Research Question

Throughout this research, our aim is to comparatively explore the psychological well-being of international and domestic students by analyzing it on three dimensions – help-seeking behavior, social support, and relatedness. Current literature outlines some of the deficits in university support as it relates to international students. Using a comparative study, we can further explore how culture, relatedness and related social factors play an important role in maintaining positive psychological well-being. The literature review provided current research on the topic, but there is a lack of comparative studies exploring differences in the psychological well-being of international students and domestic students in conjunction with social factors that potentially affect them.

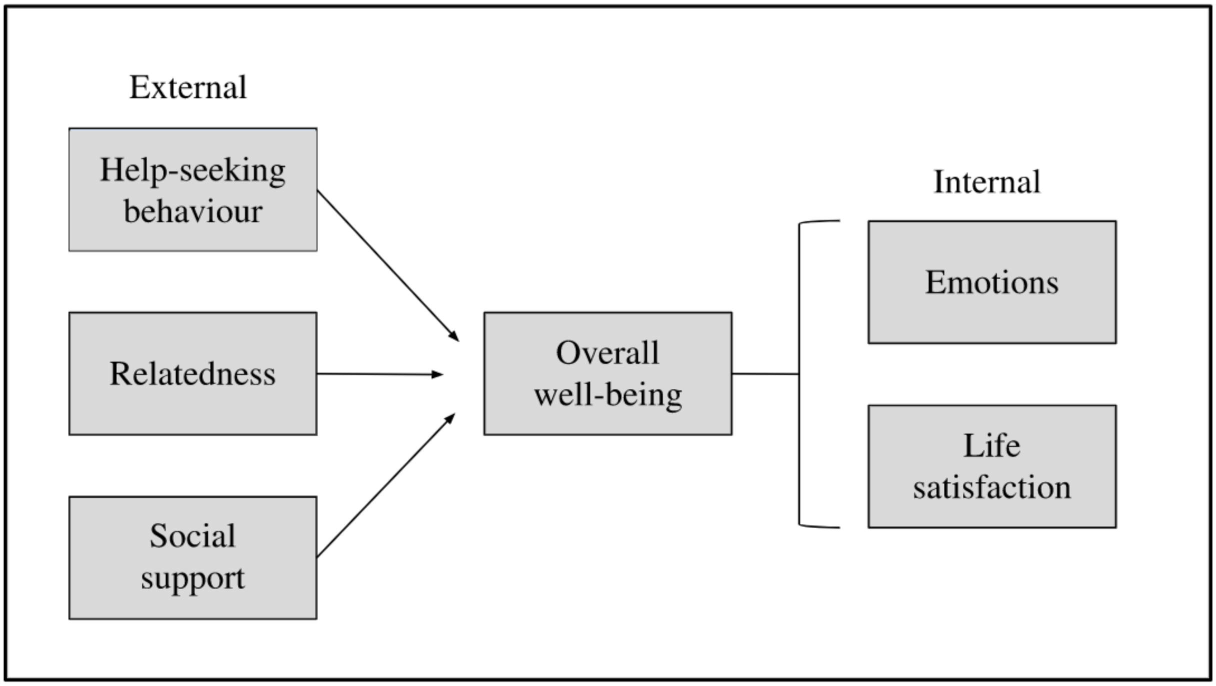
Ethical Considerations

The research was approved by the McMaster Research Ethics Board (MREB#: 0327). We have taken many steps to attempt to limit the number of ethical risks that may arise when collecting information from human participants. As such, we have ensured that the risks of our research do not outweigh those experienced in everyday life. However, there may still be some issues which merit consideration. There is a possibility for social risk if anonymity is not maintained. Despite the desire to protect anonymity, as our research took place using an online survey, participants may have decided to complete the survey in a public area which may have breached their privacy. Furthermore, as many participants may have been recruited through social media posts, their engagement with posts about the research study may have implied their involvement – therefore, revealing their identity as a participant to others. We have done our best to mitigate this by instructing participants through our letter of information to complete the survey in a private location and to not share their participation or their answers with others. Participants may have also faced psychological risks during the survey such as feelings of discomfort, worry, or embarrassment due to survey questions relating to introspectively analyzing emotions and feelings of support in the community. To mitigate this potential risk, participants were able to withdraw at any point in the survey or skip a question they did not wish to respond to.

Research Process
Step 1: MREB

To initiate the research process, it was essential to submit an application to the McMaster University Research Ethics Board to be able to involve human participants in research. This application was submitted on October 20th, 2022. This application was submitted with all required documentation – including appendices.

Step 2: Constructing the Survey



Our research focused on how different dimensions (external forces) affect overall well-being (internal representations). These dimensions are help-seeking behaviour, relatedness, and social support. Overall well-being was broken down into two different aspects – emotions/affect and general life satisfaction. The interaction of these dimensions and overall well-being were then explored comparatively between international and domestic students to gauge any existing differences and attempt to define the origin of these discrepancies in experiences.

We began constructing our survey by breaking down questions into different sections that would target each dimension specifically, as well as each component of overall well-being. Through the responses to each question, we sought to find correlations between responses to the questions focusing on external forces and those on internal representations to determine relationships between them. Open-ended questions then provided further detailed information allowing for a more comprehensive understanding of individual experiences of international and domestic students. The survey was expected to take no longer than 15 minutes in length in order to reduce question fatigue or a lack of interest in completion.

Survey questionnaires have the benefits of having low cost and high flexibility as participants are able to complete them at their desired or preferred time of the day, in an area where they may be more comfortable. The questionnaire was made up of open-ended and closed-ended questions. Open-ended questions provided our research with more substantial information on the individual experiences of participants which they explained in their own words. The closed-ended questions presented in a variety of different formats – binary answer, Likert scale, and a list of options with single/multiple answers – allowed for data which was statistically analyzed to find patterns, trends, and correlations which are crucial for the format of this comparative study.

Step 3: Recruitment

Our target population for this research was international and domestic undergraduate students studying at McMaster University who are 18 years of age or older. A pre-approved list of MSU student-led clubs were contacted about sharing our research with the members. We sought permission from the clubs to post a recruitment script on their social media page (i.e., Instagram and/or Facebook) or to email the script to potential participants. We intended to use SONA to reach students without club affiliations, however, we were unable to do so due to time constraints and administrative difficulties.

Additionally, we posted physical flyers on pre-approved areas around McMaster University buildings to attempt to attract those individuals who may not have any club involvement as well. Using the recruitment method of physical flyers around the McMaster University campus is reflective of simple random sampling as every member of the population has an equal chance of being selected to participate due to their presence on campus. There may have been a certain degree of snowball sampling, a subtype of convenience sampling, as those individuals who are a part of clubs may have shared the research project with others around them who are also students at the university.

Step 4: Data Collection

All data collected was saved to the LimeSurvey database and remained anonymous and unidentifiable. The survey was opened for data collection on November 14th of 2022 and remained available for potential participants until February 17th of 2023. Now that data analysis has been completed, we have ensured all data was deleted from all researcher’s devices and servers.

Data Analysis

For the analysis of our collected data, the combination of methods used aided in exploring a statistically significant relationship between the difference in student status (international or domestic) and psychological well-being while allowing for more descriptive pieces of data demonstrating individual experiences of participants which more significantly described the correlations, patterns, and trends observable in statistics.

Through the responses to each question, the intention was to find correlations between responses to the questions focusing on external forces and those on internal representations to determine relationships between them. Qualitative data collected from the open-ended questions served as direct quotes to offer a more explicit representation of correlations found between the dimensions of external forces and the internal manifestations that they affect. We analyzed our qualitative data by looking for trends in what participants wrote and connecting those to gather a more comprehensive overview of our data.

Statistical analysis was done using the software program, Jamovi. To assess the ways in which relatedness, help-seeking behavior, and social support influenced overall well-being, individual participant scores for each variable were calculated. Participant scores were then aggregated into a group average for each variable based on international or domestic student status. T-tests were used to test for significant differences in overall well-being and the above three external variables. Differences between groups were similarly analyzed in regards to the specific answers they gave for each external variable in order to foster a better understanding of the relationship between such dimensions and overall well-being for both groups. Correlation matrices were utilized to reveal significant correlations between the three dimension and overall well-being for international and domestic students separately.

Data Collection and Analysis Timeline

Task	**Date**
Email drafts for clubs	October 20th, 2022
Tentative recruitment starts and survey opening – emails sent out & flyers put up	November, 2022
Survey closes	February 17th, 2023
Data analysis commences	February 20th, 2023
Data analysis finishes	March 17th, 2023
Data synthesis completion	March 24th, 2023

Methodology Summary

To research the overall well-being of domestic and international undergraduate McMaster students, we recruited participants to participate in a quantitative survey using posters and social media posts. After collecting data using the MREB approved platform LimeSurvey, we analyzed our data using Jamovi to test for correlations between the three external variables and overall well-being as well as significant differences between international and domestic students. Qualitative data was analyzed manually for patterns in responses and then connected to the rest of our research to assess overall trends in data.

Results

Relevant participant demographics

We had a total of 25 participants (*n* = 7 international and 18 domestic). Most participants in both the international (57%) and the domestic group (83%) identified as women. The majority of international students (85.7%) came from countries with more collectivist cultures. Similarly, the majority of our international student sample (85.7%) felt that the culture of their country of origin was dissimilar to Canada's culture (Table 1).

Overall Well-being between International and Domestic Students

Tables 2 and 3 show the between-group t-tests for significant group differences and the means and standard deviations for each factor for both domestic and international students respectively. Contrary to our hypothesis, international students' overall well-being was slightly higher on average (M = 2.95, SD = 0.52) than domestic students (M = 2.91, SD = 0.60). This was also the case for students' sense of relatedness with international students scoring a bit higher (M = 2.36, SD = 0.56) than domestic students (M=2.28, SD=0.68). Feelings of social support were higher among domestic students (M = 3.42, SD = 0.58) than international students (M = 2.96, SD = 0.73). However, these differences were not statistically significant. The only significant difference was found in help-seeking behavior (t[23]=2.83, p=.010), which was significantly higher among domestic students (M = 1.72, SD = 0.23) than international students (M = 1.43, SD = 0.21).

Table 1
Participant Demographics

	Domestic Students		International Students	
	n=	%	n=	%
Year of Study				
1	2	11	0	0
2	3	17	1	14
3	4	22	3	43
4	8	44	3	43
5	0	0	0	0
6	1	6	0	0
Gender				
Female/Woman	15	83	4	57
Male/Man	2	11	3	43
Other	1	6	0	0
Country of Origin				
Canada	18	100	-	-
China	-	-	2	29
Poland	-	-	1	14
South Korea	-	-	2	29
India	-	-	1	14
Vietnam	-	-	1	14
Cultural Similarity				
Yes	11	61	1	14
No	6	33	6	86
No Answer	1	6	0	0

Table 2

Between-group T-Tests for Overall Well-being and Three External Variables

		Statistic	df	p
Overall Well-being	Student's t	-0.175	23.0	0.863
Help-seeking Behavior	Student's t	2.818	23.0	0.010
Relatedness	Student's t	-0.276	23.0	0.785
Social Support	Student's t	1.642	23.0	0.114

Note. H_a $\mu_{Dom} \neq \mu_{Intl}$

Table 3

Mean and Standard Deviations for Domestic and International Students

	Group	N	Mean	Median	SD	SE
Overall Well-being	Dom	18	2.91	3.00	0.597	0.1407
	Intl	7	2.95	3.11	0.521	0.1968
Help-seeking Behavior	Dom	18	1.72	1.69	0.230	0.0542
	Intl	7	1.43	1.37	0.209	0.0791
Relatedness	Dom	18	2.28	2.13	0.675	0.1590
	Intl	7	2.36	2.25	0.556	0.2103
Social Support	Dom	18	3.42	3.50	0.575	0.1356
	Intl	7	2.96	3.00	0.728	0.2751

Correlations to Overall Well-being

Table 4 reveals the correlations between overall well-being and the three external variables split by international or domestic student status. Unlike our predictions, help-seeking behavior was negatively associated with overall well-being for both domestic and international students, but this relationship was not statistically significant. Furthermore, there seemed to be a slight positive relationship between relatedness and overall well-being, which is as we anticipated, however this was also found to be insignificant. Interestingly, social support was significantly correlated to overall well-being but only for domestic students (r = 0.757, p < .001).

Differences Across the Three External Variables

Help-seeking

Knowledge of campus resources was significantly higher (t[23] = 3.22, p = .004) in domestic students (M = 1.52, SD = 0.24) than international students (M = 1.20, SD = 0.17). Additionally, domestic students seemed to feel more comfortable accessing resources (M = 2.72, SD = 0.90) than international students (M = 2.29, SD = 0.95) but tended to use campus resources less (M = 2.22, SD = 1.22) than international students (M = 2.57, SD = 1.27). However, such differences in comfortability and use of campus resources were not statistically significant (Table 5).

Table 4
Correlation between overall well-being and external variables by international and domestic Students status

		Overall Well-being		Help-seeking Behavior		Relatedness		Social Support	
		Intl	Dom	Intl	Dom	Intl	Dom	Intl	Dom
Overall Well-being	Pearson's r	—	—						
	p-value	—	—						
Help-seeking Behavior	Pearson's r	-0.730	-0.203	—	—				
	p-value	0.063	0.420	—	—				
Relatedness	Pearson's r	0.244	0.331	-0.081	0.278	—	—		
	p-value	0.597	0.179	0.862	0.263	—	—		
Social Support	Pearson's r	0.716	0.757***	-0.743	-0.366	0.397	0.129	—	—
	p-value	0.071	< .001	0.056	0.135	0.378	0.609	—	—

Note. * p < .05, ** p < .01, *** p < .001
Note. International (Intl), Domestic (Dom)

Table 5
T-Test differences in help-seeking between international and domestic students

							95% Confidence Interval			
		Statis-tic	df	p	Mean differen ce	SE differen ce	Low er	Upp er		Effe ct Size
Knowled ge of resource s	Stud ent's t	3.21 9	2 3. 0	0.0 04	0.318	0.098 9	0.1 14	0.5 23	Coh en's d	1.4 34
Comfort able accessin g resource s	Stud ent's t	1.07 7	2 3. 0	0.2 93	0.437	0.405 3	- 0.4 02	1.2 75	Coh en's d	0.4 80
Access barriers	Stud ent's t	- 0.89 7	2 3. 0	0.3 79	- 0.111	0.123 8	- 0.3 67	0.1 45	Coh en's d	- 0.4 00
Frequen cy of access	Stud ent's t	- 0.63 7	2 3. 0	0.5 30	- 0.349	0.548 1	- 1.4 83	0.7 85	Coh en's d	- 0.2 84

Note. H_a $\mu_{Dom} \neq \mu_{Intl}$

Relatedness

International students scored higher than domestic student on three of the four questions asked on relatedness (Table 6). International students felt more like a part of the McMaster community (*M* = 3.14, *SD* = 0.90) and more accepted amongst their peers (*M* = 2.00, *SD* = 0) than domestic students (M = 2.89, *SD* = 1.02 and *M* = 1.89, *SD* = 0.32 respectively). International students also seemed to be involved in a higher number of clubs (*M* = 1.71, *SD* = 0.76) than their domestic counterpart (*M* = 1.67, *SD* = 0.97). Conversely, domestic students had a higher level of participation in student life than international students (*M* = 2.67, *SD* = 0.91 vs. *M* = 2.57, *SD* = 1.13). However, none of these differences were found to be statistically significant.

Social Support

In regard to social support, we utilized a Mann-Whitney U test to assess significance as our data did not meet the assumption of equal variance (Table 7). On average, domestic students were more likely to feel comfortable expressing their emotions (*Mdn* = 4 vs. *Mdn* = 3), and feel like they had a good support system (*Mdn* = 4 vs. *Mdn* = 3) . The above differences were not found to be statistically significant, however, domestic students were significantly more likely to have social supports in the GTA or Hamilton area (*Mdn* = 2, *U* = 39.5, *p* = .028) compared to international students (*Mdn* = 2).

Table 6

T-Test for differences in relatedness for international and domestic students

							95% Confidence Interval			
		Statistic	df	p	Mean difference	SE difference	Lower	Upper		Effect Size
Feel like part of McMaster	Student's t	-0.575	23.0	0.571	-0.2540	0.442	-1.168	0.660	Cohen's d	-0.2560
Number of clubs	Student's t	-0.116	23.0	0.908	-0.0476	0.409	-0.895	0.799	Cohen's d	-0.0518
Level of participation	Student's t	0.220	23.0	0.828	0.0952	0.433	-0.800	0.991	Cohen's d	0.0980
Feel accepted by peers	Student's t	-0.897	23.0	0.379	-0.1111	0.124	-0.367	0.145	Cohen's d	-0.3997

Note. H_a $\mu_{Dom} \neq \mu_{Intl}$

Qualitative Results

Most of our qualitative data has been gathered from the question “How is your home culture similar or different from Canadian culture?” Main themes present in participant responses included the individualistic nature of Canadian culture, the value placed on mental health in Canadian culture, the lack of respect for the elderly in Canadian culture, and differences in gender roles. A participant from Poland wrote, “Gender roles are more traditional back home, […] There is a social chain of command across ages (elders

Table 7

Mann-Whitney U test for differences in social support between international and domestic students

		Statistic	p	Mean difference	SE difference	95% Confidence Interval Lower	95% Confidence Interval Upper		Effect Size
Feel they have others to depend on	Mann-Whitney U	49.0	0.363	2.95e-5		-6.31e−5	1.000	Rank biserial correlation	0.222
Social supports in GTA or Hamilton	Mann-Whitney U	39.5	0.028	3.87e-5		-8.78e−6	1.000	Rank biserial correlation	0.373
Good support system	Mann-Whitney U	50.0	0.425	4.54e-5		-1.000	1.000	Rank biserial correlation	0.206
Comfortable expressing emotions	Mann-Whitney U	37.5	0.104	1.000		-1.62e−5	1.000	Rank biserial correlation	0.405

Note. H_a $\mu_{Dom} \neq \mu_{Intl}$

get/and expect more respect from youth). I think marriage and family values are more prevalent and are stronger back home.” Furthermore, it seemed as though participants from collectivist cultures noticed the largest difference between their home culture and Canadian culture. For example, a participant from India wrote, “It is not similar, it's very different (i.e., collective vs independent)”. Another participant from Pakistan wrote, “Pakistan is very collectivistic compared to the individualistic Western country Canada.” There were also comments on Canada’s openness. One participant from Pakistan wrote, “I feel people are a lot kinder, empathetic, and honest here in Canada. […] I feel more welcomed in Canada by random strangers even than I do in Pakistan”. A participant from China wrote:

> Canadian culture places more emphasis on social support and people tend to rely on friends and other members of society when they have problems […] Also, Canadians are willing to talk to people they don't know as well as help them, but I think it would be weird if you saw someone in China who didn't have a very obvious desire to ask for help but then you asked them very enthusiastically if they needed help.

Participants also commented on whether they felt able to access services and supports in Canada. One participant from Canada wrote that the reason they do not feel comfortable accessing supports was due to a, “[l]ack of education [and] social anxiety”, while another participant expressed “[n]ot knowing how to use them.” Finally, one Canadian participant elected to write about why they feel excluded in the McMaster community writing, “I've struggled to find a group to fit into and often spend time alone or with one to two people. I don't feel like others like me that much.” These results will be further analyzed in the discussion portion of the paper.

Discussion

Overall Well-Being

Addressing our primary research question, we have found overall well-being to be higher among international students than domestic students. This finding contradicts existing literature which suggests that international students experience poorer well-being on account of their struggles with acculturation and finding support, among other issues (Rosa et al., 2021; Skromanis et al., 2018). This finding may be attributed to the possibility that those international students who willingly chose to participate in our study felt more connected to the university. Indeed, Glass & Westmont (2014) demonstrate how feelings of belongingness to the university is central to academic performance and campus involvement. Put together, international students who feel better connected to the university are more likely to participate in on-campus initiatives, and by extension, are more likely to experience greater well-being through experiences of inclusion.

As per Social Identity Theory, we can attribute higher rates of overall well-being among international students to the availability of stronger social ties and a sense of belongingness. Furthermore, the positive effects of social identification may be more pronounced for the international student population as they are a minority group within the university.

Help-seeking

Help-seeking was found to be higher among domestic students compared to their international counterparts. Out of the three external dimensions, help-seeking was the only one that showed a statistically significant correlation with overall well-being for domestic students. In other words, there were no significant differences between international and domestic students apart from help-seeking behaviors.

Help-seeking was explored through ratings of knowledge regarding campus resources, levels of comfort with accessing these resources, and actual use of campus resources. Interestingly, we see that domestic students were better aware of campus resources and felt more comfortable accessing these resources, but actual use of campus resources was higher among international students. While the variables of comfort with access and frequency of actual use lacked statistical significance, this may be attributed to the size of our sample (Faber & Fonseca, 2014). Domestic students’ higher awareness and comfort around on-campus resources can be attributed to their pre-determined comfort in socializing with the student community. Since domestic students form part of the majority group, they face fewer barriers to social identification with the university and are more likely to be aware of the kinds of support they have access to (Rosa et al., 2021). Previously, Beks et al. (2018) found that international students have lower mental health literacy compared to their domestic counterparts. We argue that the same applies to our sample population, with deficits in awareness and comfort with access applying to resources addressing mental health among international students. That being said, international students may be more likely to access those on-campus resources that address immigration concerns and foster social inclusion. Indeed, those who arrive from foreign countries are tasked with navigating social, cultural, and legal spheres with far more urgency than domestic students as their university membership relies on it. Once again, it is also likely that the international participants in our survey are better connected with the McMaster community, and owing to their involvement, are more likely to seek out and utilize resources that apply to their needs.

Finally, most of our international student respondents were part of collectivistic cultures and this may account for lower overall rates in help-seeking behaviors. Chang et al. (2020) demonstrate how individuals belonging to collectivistic cultures are less likely to seek out help to save face and maintain group harmony. Our research reflects this point as qualitative analysis has revealed that international students find more openness in Canada around topics of mental health compared to their home country.

Relatedness

In terms of relatedness, our study found that international students fared slightly higher than their domestic counterparts. Specifically, international students scored higher on three out of four variables—how much they feel a part of McMaster community, the number of clubs they're involved in, and whether they feel accepted among their peers. The fourth aspect, participation in student life, was higher among domestic students. As per Social Identity theory (SIT), higher rates of well-being and positive self-images are induced by social group inclusion. Relatedness, being the dimension most similar to the concept of belongingness within SIT, can explain international students' higher overall rates of well-being. As previously mentioned, social group inclusion appears to be far more important for international student well-being (Brunstig et al., 2021); given this, relatedness might be the most influential dimension that accounts for higher overall well-being among international students.

Social Support

To measure student perceptions of social support, we asked respondents to rate how much they felt like they can depend on others, quality of existing supports, comfort with expressing emotions, and whether existing supports are in proximity (GTA or Hamilton). Overall, it was found that domestic students scored higher on all four aspects of this dimension. That being said, the only aspect that showed statistical significance was proximity of support. This was an expected finding as domestic students are far more likely to have family, friends, acquaintances and other connections as they are born and raised in Canada. This is not the case for international students who migrate alone. Given the importance of social support for student well-being, it is surprising that our international sample scored lower on this dimension despite being higher on overall well-being. We reason that domestic students' active efforts to seek out help might offset some of the deficits created by a lack of support.

Broader Significance of Research

Our research presents as an important starting point for a comparative study of this nature as there are very few studies that directly compare the overall well-being of international and domestic postsecondary students within Canada. By exploring how external dimensions such as help-seeking, social support and relatedness affect life satisfaction and emotional well-being, we have also developed a unique method of analyzing student well-being. That being said, a number of limitations such as small sample size and incomplete responses make it difficult to generalize and validate several research findings made throughout this study. Indeed, the only differences with statistical significance were found in help-seeking whereby domestic students possessed greater awareness of available resources, and domestic students' greater availability of social support within proximity compared to their international counterparts. Having achieved statistical significance on these sub-dimensions, we can highlight these elements as key points of analyses in future comparative studies. Furthermore, lower ratings of help-seeking and social support among international students position these aspects as important points of intervention for the student group.

Conclusion

Summary

Through our research, we aimed to explore and compare the psychological well-being of international and domestic students. We recognize that international and domestic students come from diverse backgrounds and that their lived experiences will differently impact the dimensions that we explored. Based on the additional challenges and stressors that international students might experience, we hypothesized that international students might report lower relatedness, social support, help-seeking behaviors, therefore, demonstrating lower overall life satisfaction.

Contrary to our hypothesis and other studies, our research demonstrates that international students have slightly better overall well-being than domestic students although it was an insignificant difference. There were no statistically significant correlations between our dimensions and overall well-being for international students. For domestic students, the only statistically significant correlation was between social support and overall well-being. International students also scored higher on relatedness, however, the difference in scores was insignificant. Domestic students scored higher on social support and help-seeking behaviors but only the difference within help seeking behaviors was statistically significant. Domestic students had a significantly higher degree of knowledge of on campus resources and significantly more social support within the GTA and Hamilton. All other findings were insignificant.

Limitations

Survey

There were several potential limitations to our research. The first set of potential limitations was logistical. The time we had for this project was limited and that, in turn, limited our ability to be as thorough as possible in our data collection and analysis. It is also possible that some nuance was overlooked in our data due to the restrictive number of questions permitted on the survey. Although we have carefully considered the feasibility of the scope of our topic, there are always factors that may apply that we did not have time or room to examine.

An example of this is the potential impact of mental illness on psychological well-being. We did not have room in our research to examine the influence of mental illness, nor would we be ethically approved to do so as it would be above minimal risk, however we acknowledge that it has an impact on psychological well-being. Furthermore, nuance may have been lost due to the research being quantitative rather than qualitative. Since we studied a highly personal topic, it is possible that we may have misinterpreted responses or not gotten the full picture from the survey.

The final limitation was the opportunity for misinterpretation or misunderstanding due to cultural or language barriers. Our study was highly reliant on international students and the cultures they come from were likely to influence their answers and how they understood our questions.

Sample Size

Our sample size (n=25) made up of domestic (n=17) and international (n=8) students was somewhat representative of the ratio of students at the undergraduate level. Despite this representation, the number of participants we received restricts the conclusions that can be made about our findings. It was found that international students have a higher overall well-being than domestic students. However, it is important to consider that those students who found our survey (due to the nature of recruitment through posters around campus and club emails) would have somewhat of a higher involvement with campus life. As we expressed in our theory, those with more relatedness, social support, and help-seeking behaviours would probably have higher well-being. Due to ethical constraints, we were unable to share this survey with a wider audience, such as sharing this via email announcements directed from International Student Services. Those accessing these support services would potentially have a wider range of experiences and involvement, hence a more representative sample.

Immigration Status

International and domestic students are differentiated by their individual “official immigration status” in Canada. International students need a study permit to study, whereas domestic students (permanent residents, citizens, refugees, etc.) do not require one. In our efforts to explore the lived experiences of individuals taking part in our survey, we came across a challenge regarding these distinctions. We did not include a question asking participants to identify their status in the country. We made this decision as we acknowledge the complexity and intricacies of “official status” and how this interacts with lived experience. For example, despite a student being newly arrived in Canada, they may (officially) be considered domestic due to their immigration status, like in the case of a refugee. Although this cohort of students would be included in the domestic sample, they may have experiences which reflect those of an international student. Lived experiences, being at the forefront of our research, took precedence, hence, our decision to avoid restricting individuals to their “official status.” Using questions regarding the country with which they identified the most and the reported levels of similarity between their country to Canada, we were able to deduce their status of domestic versus international. For future research stemming from this study, we would want to find a way to make those distinctions clearer between international and domestic students, while still allowing for those experiences of newly arrived students to be highlighted within the research.

Significant Insights

This research has provided significant insights into the relationship between social support and its various effects on mental health for both domestic and international students. We have also learned more about the mediating role of social groups in increasing or decreasing feelings of school connectedness and overall belonging for both groups. As it highlights the limitations of current policies or services, our research has the potential to further the development of future mental health programs and supports for students. Our key finding, which contradicts our original hypothesis and provides a compelling and significant insight, is that international students have a greater level of overall well-being in comparison to domestic students. Furthermore, the study indicates that there are no notable variations in social support in general, with only help-seeking behavior showing a significant statistical difference.

Concluding Statements

Future research can explore dimensions of help-seeking, relatedness and social support among a larger group of university students. It would help to use recruitment methods that identify and tap into groups/clubs/organizations that are made up of international students since this portion of our sample was deficient. Additionally, future research may benefit from exploring a way to include valuable lived experiences while making a more defined distinction between international and domestic students.

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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

October 2022	- Design sampling technique, recruitment scripts, and letter of information to prepare for data collection. - To be completed before Oct. $20^{th,}$ 2023	Research proposal due Oct. 20^{th}
November 2022	- 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	- Continue data collection - Continue to work on revisions	
January 2023	- Continue data collection - Continue to work on revisions	
February 2023	- 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	- 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	- 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

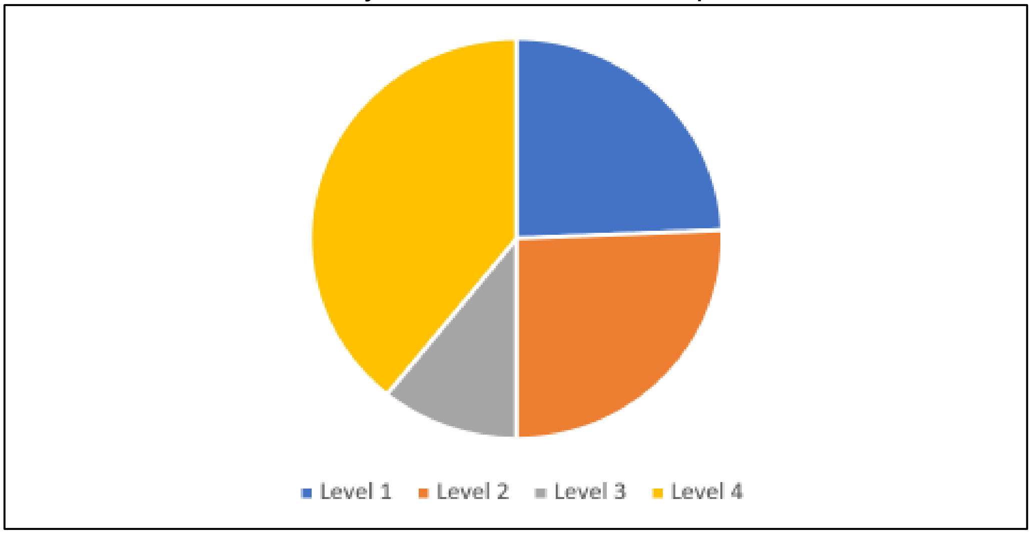


Figure 3 shows a correlation matrix for measures of academic agency, including self-efficacy, forethought, self-reflectiveness, and performance. In all participants, academic agency was relatively high on a scale out of sixty-five (Mean = 50.3, SD = 6.56). Measures for a participant's academic agency 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

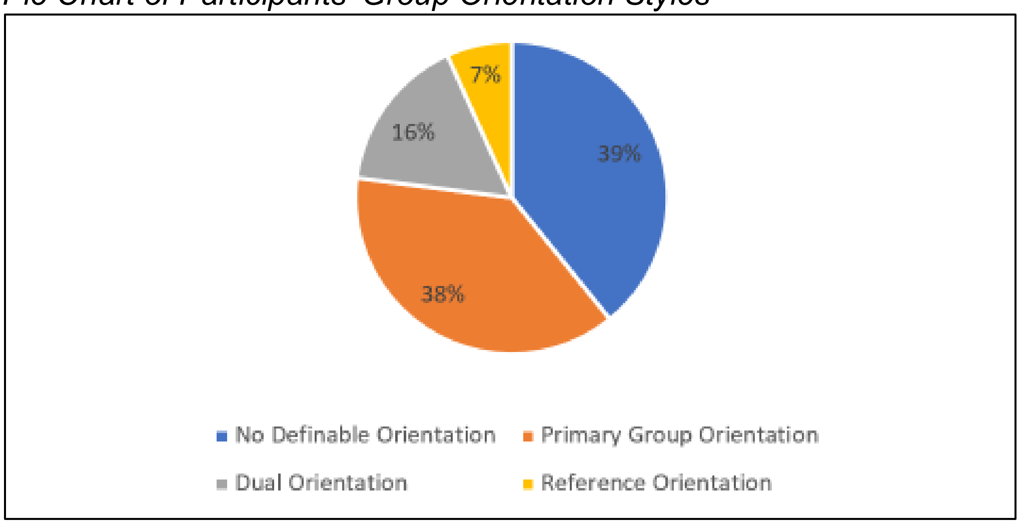


Figure 3

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

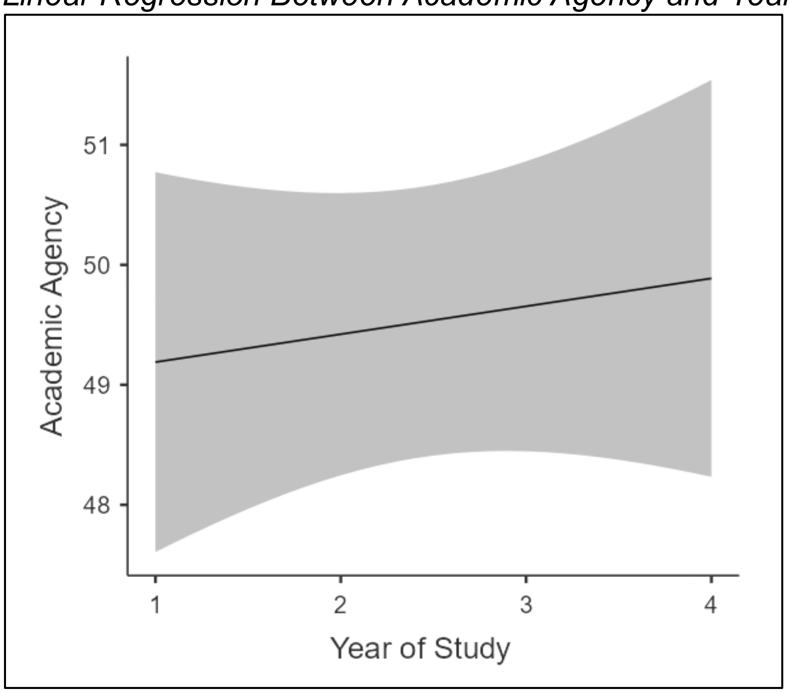
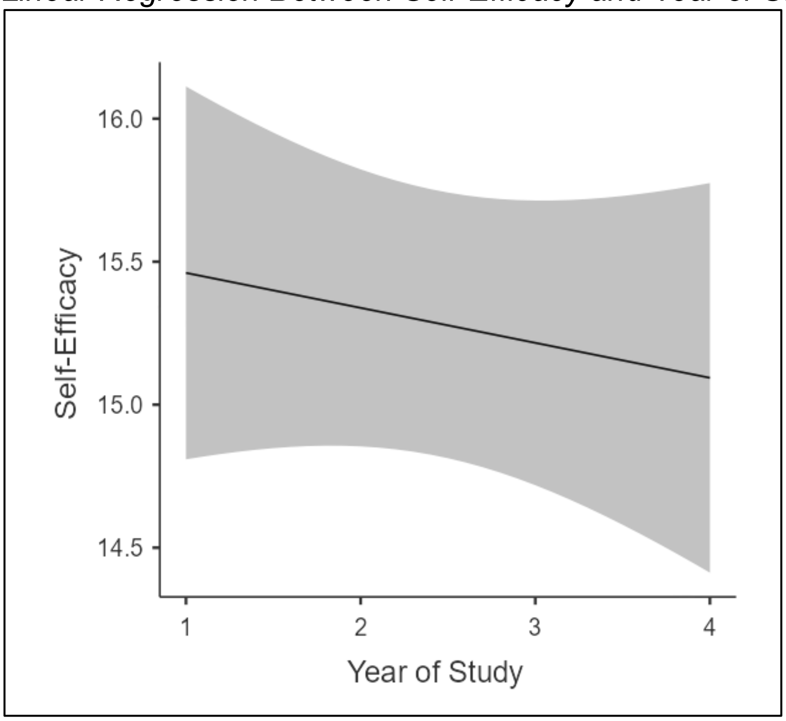


Figure 5 illustrates a linear regression between self-efficacy and year of study. Unlike Figure 4, self-efficacy is negatively correlated with year of study. The mean for self-efficacy for the whole sample was relatively high on a scale out of twenty (Mean = 15.6, SD = 2.77). Self-efficacy was higher 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

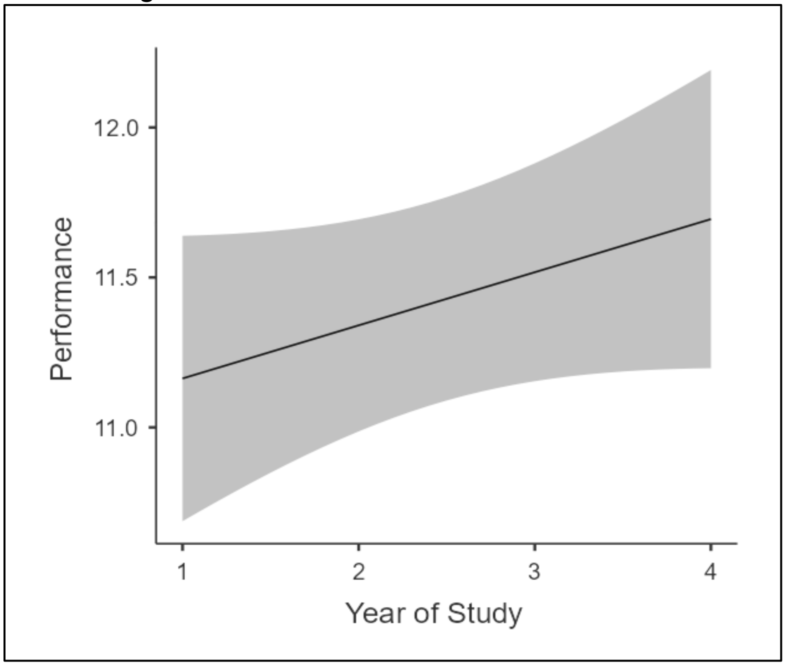
Linear Regression Between Self-Efficacy and Year of Study



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 ($r = 0.050$, $p = 0.672$).

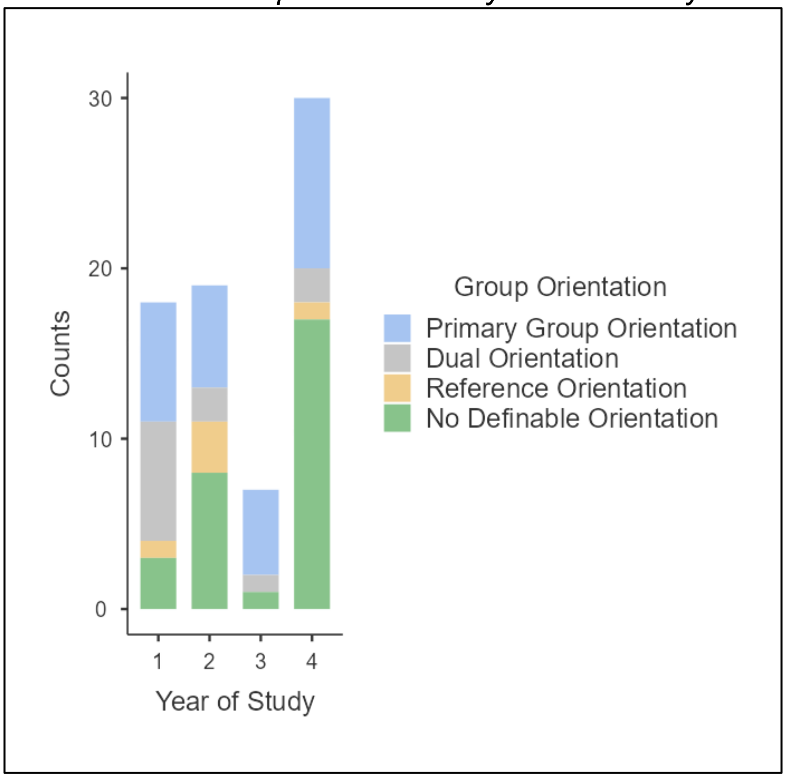
The most significant finding in this section of our analysis is that all measures for academic agency, but one, follow a weak positive trend with year of study. Self-efficacy is the only measure to have a weak negative correlation within measures of academic agency, whereas self-reflectiveness, performance, 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

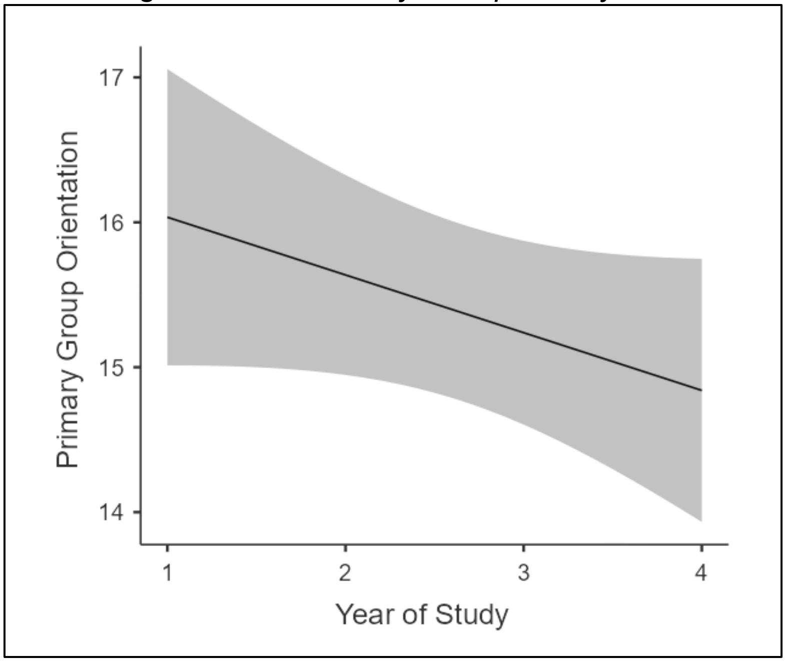


Affinity for primary groups was measured on a scale out of 23 (our benchmark for primary group orientation was 16 or greater). Out of the whole sample, participants reported a mean beneath this threshold (Mean = 15.4, SD = 2.66). Separated by year of study, third-year students show the highest mean scores 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

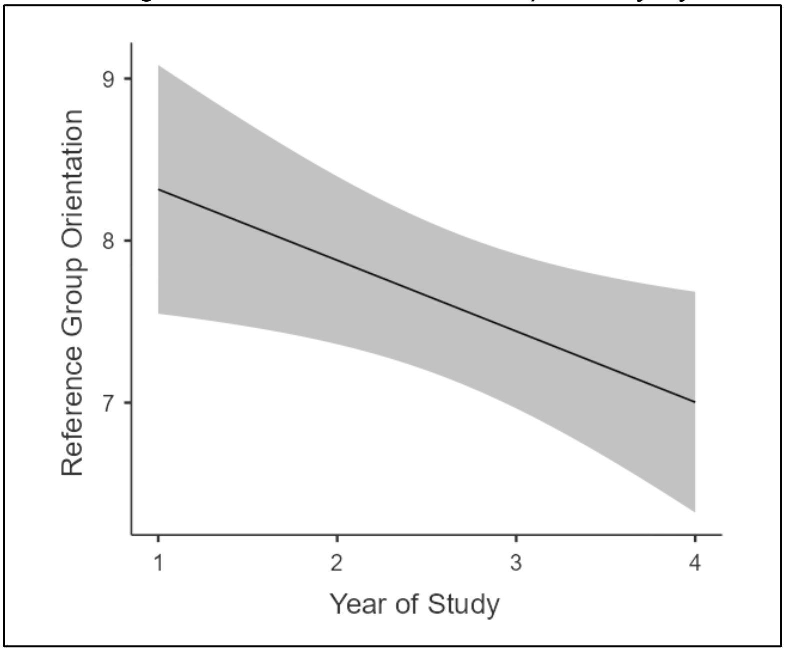


SD = 2.33) and fourth year students reported the lowest scores for reference group affinity (Mean = 6.97, SD = 1.74). Overall, there was a weak negative correlation between reference group orientation and year of study, r = - 0.265, p = 0.022 (see Figure 9). This finding was statistically significant.

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.

		Year of Study				
Group Orientation		1	2	3	4	Total
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

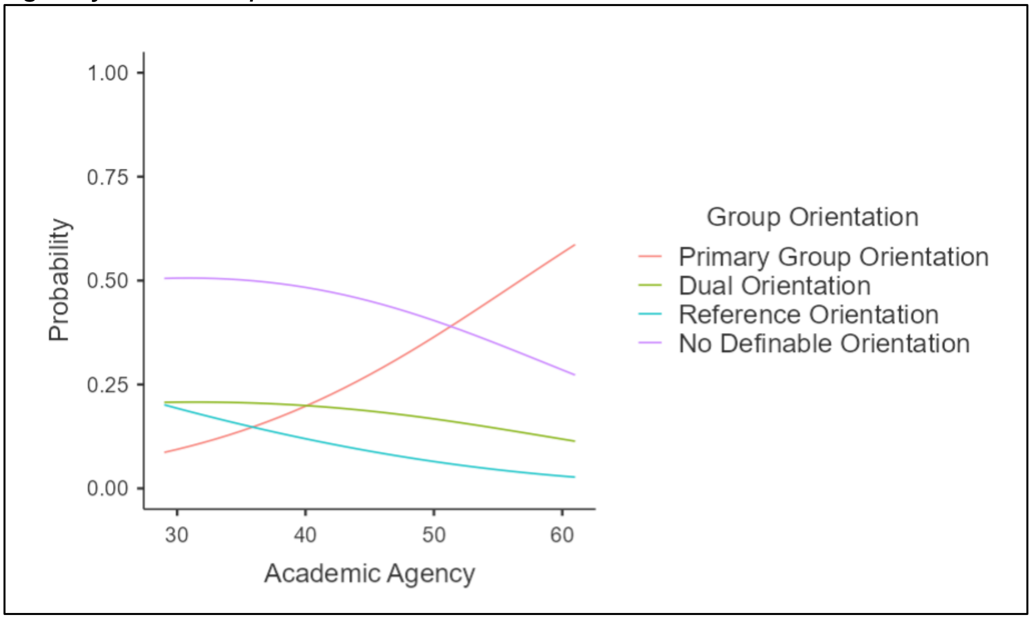
	Value	df	p
χ^2	19.4	9	0.022
N	74		

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

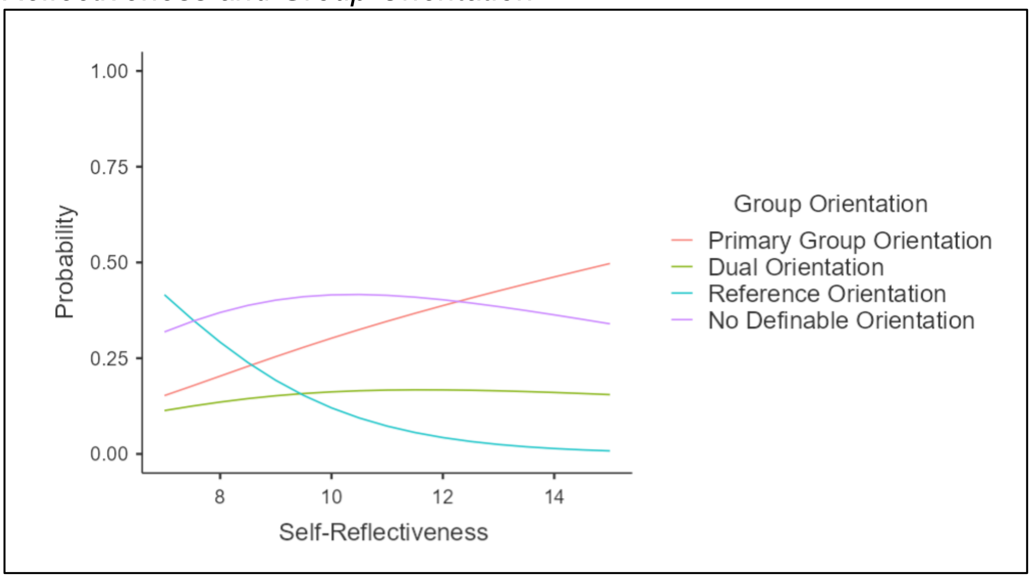
Estimated Marginal Means for Multinominal Logistic Regression Between Academic Agency and Group Orientation



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

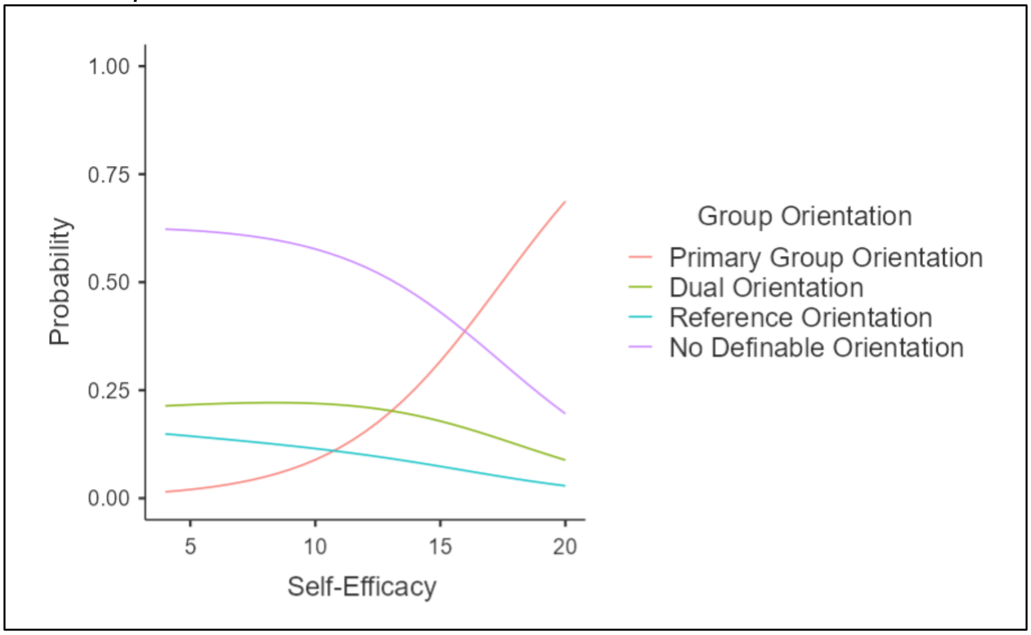
Estimated Marginal Means for Multinominal Logistic Regression Between Self-Reflectiveness and Group Orientation



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 Multinominal Logistic Regression Between Self-Efficacy and Group Orientation



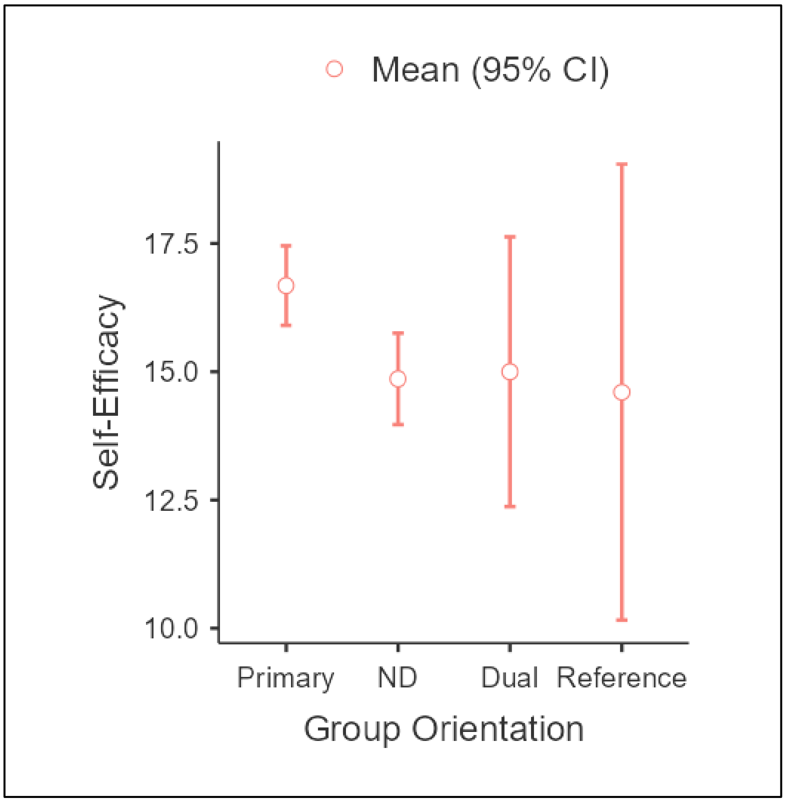
Adding to Figure 13 and the differences between groups regarding self-efficacy, we used post-hoc and ANOVA tests to compare the means between groups. Notably, there were substantial differences in means on this measure. Between primary group orientation and no definable orientation, we noted a mean difference 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 multinominal 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,

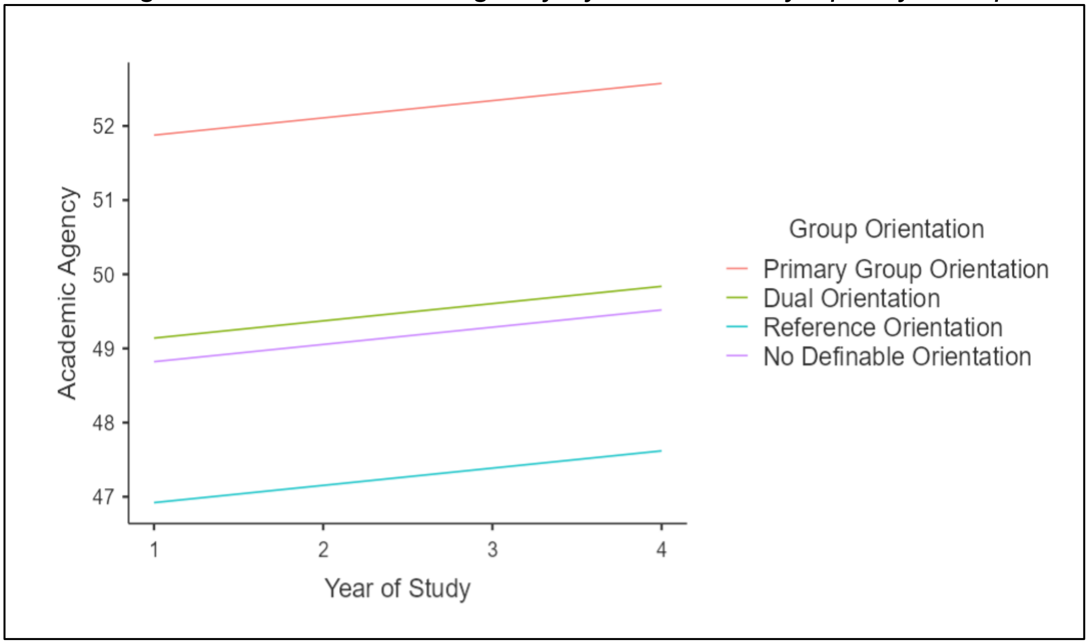
Figure 14b

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 is 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

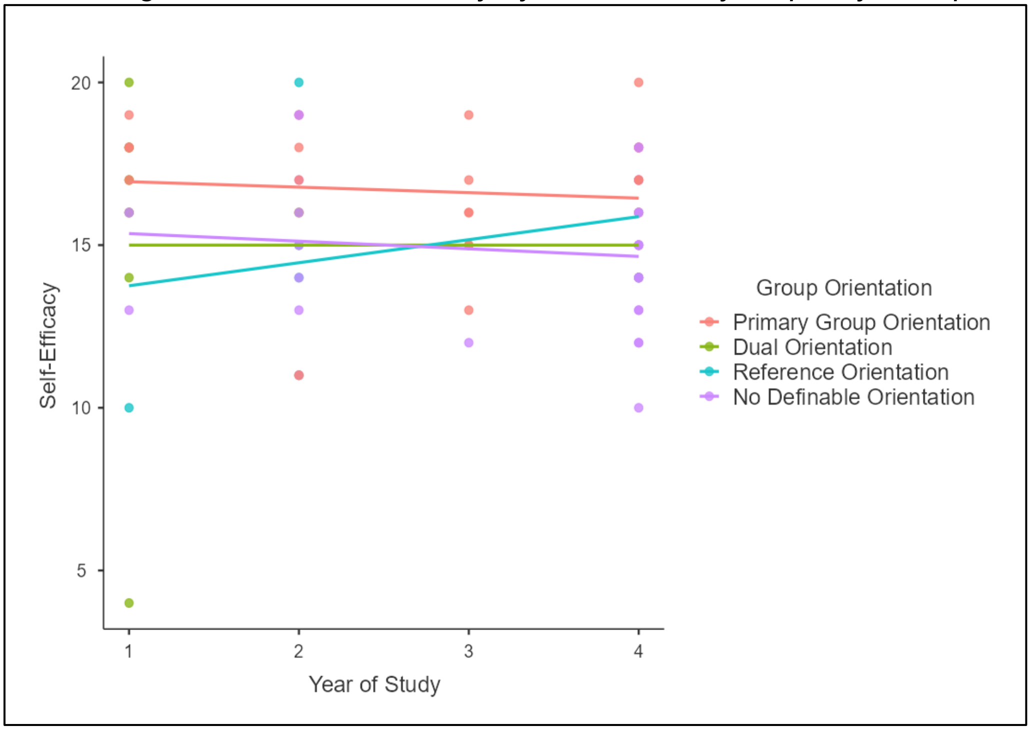


Figure 17

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

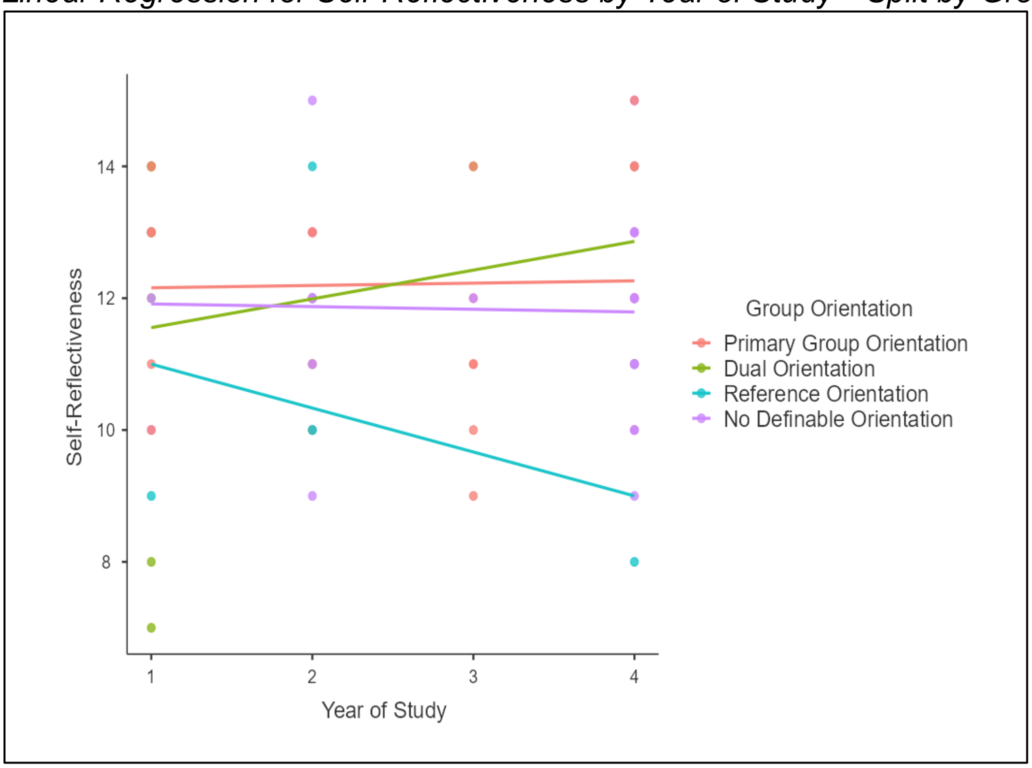
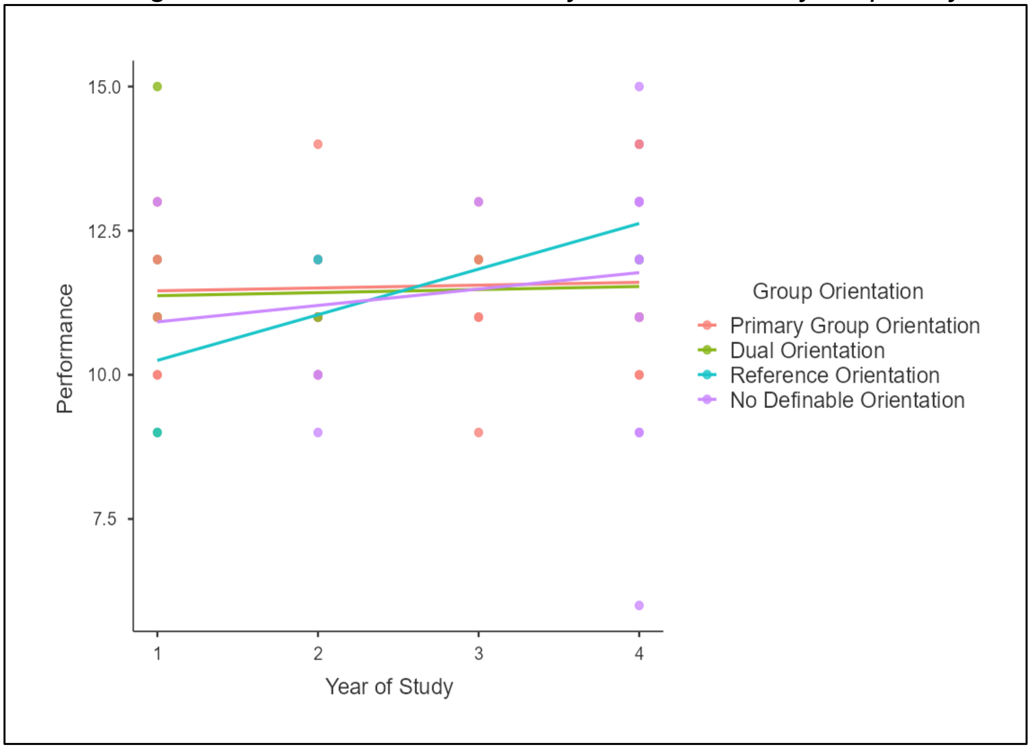


Figure 18
Linear Regression for Performance by Year of Study—Split by Group Orientation



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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Rates of Imposter Syndrome Among Female-Identifying Individuals in Undergraduate STEM Programs at McMaster University

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Abstract

Imposter syndrome is characterized by an individual lacking an internal sense of success, regardless of achievements, resulting in feelings of 'intellectual phoniness' (Clance & Imes, 1978). Regardless of their achievements, many academic professionals experience this phenomenon. Previous research shows that female-identifying individuals in STEM programs experience gendered expectations, biases, and stereotypes within male-dominated fields, creating barriers as a result of gender discrimination (O'Connell & McKinnon, 2021; Crawford, 2021). This research was conducted as part of a group-based thesis for SOCPSY 4ZZ6 and had received MREB ethics approval. This research aimed to determine if rates of imposter syndrome are higher for female-identifying individuals in male-dominated fields. Additionally, we aimed to observe the factors contributing to the persistence of imposter syndrome. We recruited 44 undergraduate McMaster students and collected data using an online, anonymous application, Lime Survey, to collect both qualitative and quantitative results to evaluate the levels of imposter syndrome among undergraduate students at McMaster. Our results showed that there was no correlation between higher rates of imposter syndrome and female-identifying individuals as well as those in STEM programs. Rather, we found that imposter syndrome is prevalent at equally high rates across faculty and gender. More research needs to be conducted on this topic to confirm our results.

Introduction

Despite high academic excellence and achievement, many academic professionals lack internal validation for their successes and fear exposure as an intellectual fraud (Mullangi & Jagsi, 2019; Clance & Imes, 1978). Imposter syndrome concentrates on students experiencing academic invalidation due to their own cognitive distortions. This phenomenon can be depicted as lacking an internal sense of success, regardless of achievements, resulting in feelings of 'intellectual phoniness' (Clance & Imes, 1978). The theory's origins focused on high-achieving women in academic spaces who continuously discounted their inherent abilities but attributed their success to external causes, such as luck (Clance & Imes, 1978). As a result of their internal feelings of fraudulence, the individual focuses on maintaining the impression of a scholar through self-monitoring behaviours (Parkman, 2016). As such, imposters have heightened stress and anxiety

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levels due to their hyper-focus on maintaining a false identity, internalizing failures, and fear of exposure as an imposter (Parkman, 2016).

Our team of researchers investigated the prevalence of the imposter phenomenon in undergraduate students at McMaster University. The theoretical frameworks selected in our research focus on imposter syndrome and intersectionality, a perspective to understand the interconnections of compounding social systems and categories (Atewologun, 2018). In concurrence, these frameworks provide a beneficial lens for understanding the prevalence of imposter syndrome within academic spaces resulting from societal and institutional oppression. This research evaluated the prevalence of imposter syndrome in female-identifying undergraduate students in science, technology, engineering, and mathematics (STEM) programs at McMaster University. For the purpose of our study, we refer to science, technology, engineering, or mathematics programs as STEM programs.

Purpose

This research aims to determine if rates of imposter syndrome are higher for female-identifying individuals in male-dominated fields, as well as the factors contributing to the persistence of the imposter phenomenon. The methods within this research included an anonymous online survey to collect demographic information and data measuring the levels of imposter syndrome among students. The final count of respondents for the survey consisted of 45 McMaster undergraduate students over the age of 18. The survey was completed anonymously and confidentially by each individual. Due to a facetious survey response, we analyzed 44 responses and excluded one as it may have skewed our results.

Research Question

Our team of researchers determined and examined the prevalence of imposter syndrome in female-identifying undergraduate students in science, technology, engineering, or mathematics programs, commonly known as STEM programs, at McMaster University. Through examining and comparing our chosen demographic and other groups of undergraduate students, such as non-female-identifying students in STEM programs and female-identifying students in programs not associated with STEM, our research identified the prevalence of imposter syndrome among female-identifying individuals in STEM programs. It is apparent that STEM programs in all different areas of work, such as undergraduate programs, fields of work, and more, are typically heavily dominated by male-identifying individuals.

In order to determine the prevalence of this phenomenon, our research question is: are rates of imposter syndrome higher for female-identifying undergraduate students in STEM programs compared to non-female-identifying undergraduate students in STEM programs or undergraduate students in other programs of study not related to STEM programs? Our research team has selected this research focus to better understand imposter syndrome and the ways in which this phenomenon impacts groups of individuals, as well as to evaluate the connection to female-identifying individuals in STEM undergraduate programs. We hypothesize that female-identifying individuals in STEM programs at McMaster University will display higher rates of imposter syndrome.

Literature Review

Origins of Imposter Syndrome

The literature surrounding the imposter phenomenon considers these cognitive distortions to arise from a combination of family dynamics, gendered social expectations, and historical representations of scholars. In their research, Clance and Imes (1978) found that family dynamics significantly impact the academic identity of women, starting from an early age. Clance and Imes (1978) argued that “imposters” can typically be categorized into one of two groups. The first group includes women with a sibling or relative who has been assigned the “intelligent” family member (Clance & Imes, 1978, p. 242). In this, she will struggle to prove her intelligence to her family members but will never be seen as having greater or equal intellectual skills. This type of imposter will use school as an opportunity to showcase her intelligence and search for academic validation, although the family is still typically unimpressed. As a result, she may begin to believe her family’s interpretation that she is not “the smart one,” and the imposter phenomenon emerges (Clance & Imes, 1978).

The second group comprises women who have been praised as superior in intellect and talents by their families (Clance & Imes, 1978). As such, her family promotes that she can easily accomplish any task with minimal struggles. When she begins to experience difficulties in achieving success, she will feel obligated to fulfill her family’s expectations, even when it is not sustainable. This will invoke feelings of anxiety and doubt when she cannot live up to the standard of “perfection with ease”; as such, she will conclude she is not intelligent and must be an intellectual imposter (Clance & Imes, 1978). The results from Clance and Imes (1978) indicate that imposter syndrome develops in relation to familial and societal expectations.

The socially enforced expectations of gender roles and historical representations of scholars contribute to feelings of imposter syndrome. In Meyers’ (1987) work on the paradox of feminine socialization, it was discussed how feminine socialization threatens personal autonomy through the construction of the traditional woman. This depicts the ‘traditional woman’ as including the grooming of feminine roles since birth, deep emotional ties to others, and a home-centred orientation (Meyers, 1978). The sex-role stereotyping begins in early childhood and is maintained through parental expectations (Clance & Imes, 1978). This type of socialization directs women away from academic and professional spaces by promoting an ideology that they belong elsewhere.

In contrast, masculine socialization promotes work-oriented options free of stigmatization (Meyers, 1978). With this, Edwards (2019) discussed the implicit messages presenting dominant social identities in conceptualizing a traditional scholar. These socially constructed messages included White, affluent, cis-gendered males like Albert Einstein. The overrepresentation of the dominant identities reinforced messages that result from macro-level racism, sexism, and classism (Edwards, 2019). This creates a societal stereotype that women are less intellectually able than men which is exacerbated by social forces (Clance & Imes, 1978).

The social factors contributing to imposter syndrome concur with intersectionality, as the ideologies presented are rooted in privilege and oppression (Edwards, 2019). Marginalized groups internalize these dominant ideologies creating a sense of “otherness” to which the feeling of not belonging contributes to the prevalence of imposter syndrome (Edwards, 2019).

Persistence of Imposter Syndrome

Imposter syndrome asserts itself through persisting cognitive distortions and their related behaviours. Gadsby (2022) explained that the imposter phenomenon is perpetuated through cognitive distortions within the individual's interpretation of their intellectual capabilities and accomplishments. Imposter syndrome persists through the affective and doxastic features of these cognitive distortions (Gadsby, 2022). The affective features pertain to a fear of being discovered as an imposter while in a position one does not deserve. The fear of exposure as an imposter creates adverse psychological consequences, including anxiety, stress, and emotional exhaustion (Gadsby, 2022). The doxastic features concern exposure and belief in inadequacy and lacking ability (Gadsby, 2022).

These features will create a biased perception of their personal evaluations, as the individual will attribute their successes to situational factors rather than dispositional factors. In this, the individual will avoid objective and external evidence of their intelligence as a form of self-deception (Gadsby, 2022). These self-deceptive interpretations of the evidence are maintained by focusing on supporting evidence, avoiding contradicting evidence, sampling memory supporting these biases, and interpreting evidence following biases (Gadsby, 2022). Through these cognitive distortions and self-deceptive biases, individuals will begin to believe in their own inadequacy.

The experience of the imposter phenomenon is maintained through the behaviours associated with cognitive distortions. Clance and Imes (1978) describe four sets of behaviours as manifestations of imposter syndrome. The first group of behaviours consists of diligence and hard work motivated by a fear of avoiding discovery as an intellectual imposter. As such, the individual will engage in a cycle of worrying about their intelligence, working hard, and attempting cover-up strategies, all reinforcing temporary feelings of approval (Clance & Imes, 1978). The main priority becomes impression management through self-monitoring behaviours (Parkman, 2016).

The second classification of behaviours pertains to intellectual inauthenticity, in which the individual will engage in intellectual flattery with academic peers. This includes supporting their biases and avoiding disagreement with their viewpoints due to fear of their judgements (Clance & Imes, 1978). In this, the individual will avoid the judgement of their authentic views to prevent the discovery of their imposter status (Gadsby, 2022).

The third set of behaviours individuals with imposter syndrome engage in consists of using charm and perceptiveness to seek approval from academic peers and supervisors (Clance & Imes, 1978). Clance and Imes (1978) explained that these women would use their charming interpersonal skills to become well-liked by an admired, professional mentor. In this, she will search for recognition and validation of intellectual abilities from her mentor (Clance & Imes, 1978). The final group of behaviours is categorized by the negative consequences of displaying confidence as a woman (Clance & Imes, 1978). There is a conflicting disconnect between autonomous competency and femininity (Meyers, 1987). Clance and Imes (1978) argued that independent, successful women are portrayed as hostile and destructive. They explained that a woman might be rejected or considered less feminine due to her achievements, stating that “as long as she maintains the notion that she is not bright, she imagines that she can avoid societal rejection” (Clance & Imes, 1978, p.6).

Undergraduate STEM Programs

To understand STEM programs, they must be evaluated and defined in addition to the stereotypes and societal standards associated with these programs. According to many scholars, there is a lack of a standard definition for what is considered a STEM job or program (Beede et al., 2011). Typically, STEM fields are comprised of programs with a strong focus on physical sciences, technology, engineering, or mathematics (Beede et al., 2011). There is a debate as to whether fields relating to healthcare, education, and social sciences are to be included in the STEM field (Beede et al., 2011).

Currently, STEM is the fastest-growing field among different levels of professionalism; however, this field still faces issues, such as inconsistency and a significant lack of representation among female-identifying individuals (Cadaret et al., 2017). It is possible that the severe lack of representation and inconsistency of women in STEM programs is related to the general decline of interest in STEM programs in recent years (García-Holgado et al., 2020). Individuals from all groups are beginning to turn their attention away from jobs in the STEM field and focus more on jobs and programs in various fields (García-Holgado et al., 2020). Scholars and researchers claim that young female-identifying individuals in their high school years do not often see or consider STEM-based undergraduate programs as an option for their future. This, in turn, creates a significant gender gap in STEM programs globally (García-Holgado et al., 2020).

This gender gap is also heavily influenced by the stigmatization of female-identifying individuals in STEM fields, which will be discussed further. STEM programs globally are heavily male dominated. Female-identifying individuals are severely underrepresented within the population of STEM-related positions globally; however, female-identifying individuals make up most of the population enrolled in undergraduate and graduate programs (García-Holgado et al., 2020).

The Stigmatization of Women in STEM

A common theme seen throughout much of the research collected on female-identifying individuals in STEM undergraduate programs is that these individuals often face stigma and harsh stereotypes, which in turn prevents them from going into these STEM-related fields (García-Holgado et al., 2020). As of 2011, female-identifying individuals held less than 25 percent of STEM-related jobs due to the stigmatization these individuals felt in their workplace (Beede et al., 2011). Gender stereotypes play a prominent role in how individuals plan for their future and choose the path they want to explore further. According to many scholars, children can identify gender stereotypes by the second grade and typically begin associating mathematics with male-identifying persons (Kahn & Ginther, 2017).

School-aged boys typically assume themselves to be associated with mathematics and science, whereas school-aged girls will begin associating themselves with reading and writing skills (Kahn & Ginther, 2017). These strong stereotypes, as they grow, will begin to prevent young girls and female-identifying individuals from pursuing STEM-related careers and education in fear of going against societal values and expectations (Beede et al., 2011). Preferences heavily influenced by societal gender norms and gender stereotypes are a major driving force in individuals' life choices and the underrepresentation of female-identifying individuals in many fields of study (Kahn & Ginther, 2017). Gender stereotypes, preferences, and stigmatizing forces are behind the underrepresentation of female-identifying individuals in STEM-related fields worldwide (Reilly et al., 2019). Female-identifying individuals are highly underrepresented in STEM fields for various reasons (Beede et al., 2011).

According to Reilly et al. (2019), the predominant reason for the underrepresentation of female-identifying individuals within STEM programs is due to stigma consciousness (Reilly et al., 2019). Typically, this underrepresentation level is associated with male-identifying individuals and female-identifying individuals' choices regarding their careers through incentives and education (Beede et al., 2011). STEM career paths are highly associated with and are highly populated by male-identifying individuals; therefore, these job placements are made to be more accommodating to that group of people (Beede et al., 2011). Due to this lack of accommodation, female-identifying individuals feel pressure to switch careers and turn to a position in a field unrelated to science, technology, engineering or mathematics (Cadaret et al., 2017).

These female-identifying STEM employees often claim that this pressure will cause them to give in to societal norms and leave their STEM field mid-career (Reilly et al., 2019). The previously mentioned awareness of stigmatization will create an internalized awareness of stigmatization for female-identifying individuals in STEM-related fields, which is another reason for this group to leave their positions in STEM-related jobs (Reilly et al., 2019). A familiar feeling shared by this group is that they do not feel as though they belong in STEM-related fields and are often told how STEM-related fields are much better suited for male-identifying individuals (Reilly et al., 2019). These are just a few of the reasons female-identifying individuals feel they do not belong in a specific field that researchers have touched upon.

Imposter Syndrome Among Women in STEM

The barriers faced by female-identifying individuals in STEM programs create biases that adversely affect female-identifying individuals in male-dominated environments. Stereotypes and biases about female-identifying individuals' ability to engage with STEM programs reflect the male orientation of the field (O'Connell & McKinnon, 2021). The 'lack of fit' model explains the perceived incongruity between the requirements for a job and the individual's attributes and skills (Crawford, 2021). Due to the societally constructed expectations of STEM fields, female-identifying individuals are less likely to be considered a good fit within masculine jobs. There is a predisposition toward negative perceptions and judgements of female-identifying individuals in STEM (Crawford, 2021).

The gendered evaluations of female-identifying individuals as warm and nurturing effect academic perceptions, in which female-identifying people are more likely to be judged on appearance and personality rather than acknowledge their professional abilities (O'Connell & McKinnon, 2021). These create biased perceptions of female-identifying individuals in STEM fields, including the tightrope bias and the prove-it-again bias (Crawford, 2021). The tightrope bias pertains to gendered stereotypes of how female-identifying individuals should present in male-dominated spaces. In this, female-identifying individuals struggle to conform to societal expectations of feminine qualities while fitting into the necessary masculine qualities of the job, such as being assertive, direct, and competitive (Crawford, 2021).

Similarly, the prove-it-again bias refers to individuals who do not exemplify the traditional characteristics of the career position they hold, resulting in feeling as though they must continuously prove their competence and abilities over and over again (Crawford, 2021). Crawford (2021) explained that female-identifying individuals are punished when they do not conform to gendered expectations of behaviour, forcing them to act in ways that do not advance their careers. These double standards produce microaggressions creating societal and institutional disadvantages for female-identifying individuals in STEM programs (O'Connell, 2021).

The biases in male-dominated fields reinforce gender stereotypes in STEM fields. This encourages female-identifying individuals to internalize gender discrimination about who participates in STEM fields, contributing to the prevalence of imposter syndrome (O'Connell, 2021). In concurrence with these barriers, the experience of the imposter phenomenon for female-identifying individuals in STEM programs can produce negative psychological effects on the human psyche, including anxiety, depression, low self-esteem, and self-handicapping behaviours (Crawford, 2021).

Limitations of Research

The limitations within the literature surrounding imposter syndrome exist in the structure of the study and data collection. Firstly, much of the research consisted of studies mainly focusing on the experiences of White women (Cadaret et al., 2017, Reilly et al., 2019). Much of the data presented in these studies faced an underrepresentation of individuals who identify as part of Black, Indigenous, and People of Colour groups. It is important to recognize the intersectionality of multiple identities and the ways in which they create unique experiences based on the combination of race and gender (Crenshaw, 1989). Female-identifying individuals of racial minorities have lived experiences that differ from White female-identifying individuals. As such, gender identity, in combination with racial identity, creates unique intersections of systems of oppression. This can effect the interpretation of the results and the generalizability of experiences of imposter syndrome for female-identifying individuals.

Second, the results of the experiences of imposter syndrome for women in STEM may not be generalizable within each individual STEM program (Reilly et al., 2019). Much research focuses on STEM programs as an entire category rather than evaluating experiences of imposter syndrome within each program. As such, it is not known which programs experience the highest rates of imposter syndrome; rather, STEM programs have a higher prevalence as compared to non-STEM programs. Additional research would need to be conducted on the individual programs and how they compare to one another.

Finally, most data collections utilize cross-sectional, self-reported data (Reilly et al., 2019). This type of research evaluates individual experiences at one point in time. Longitudinal observational designs would strengthen the validation and robustness of the findings, as individuals' attitudes and behaviours could be measured over time. This would allow the researcher to investigate the interaction between intrapersonal and social factors, as well as the ways in which these factors affect feelings of fraudulence. Additionally, the researcher can evaluate the correlation between attitudes and behaviours exemplifying the traits associated with imposter syndrome over longer periods of time.

Theoretical Framework

Imposter Syndrome

Throughout our research, we drew upon two theoretical frameworks: imposter syndrome and intersectionality. Imposter syndrome is a term used to define individuals who distrust their abilities and fear being discovered as a fraud (Mullangi & Jagsi, 2019). This phenomenon is especially apparent in women (Clance & Imes, 1978). Individuals who suffer from imposter syndrome do not exhibit specific diagnostic criteria; however, they typically show symptoms relating to generalized anxiety, an absence of self-confidence, depression, and frustration at being unable to fulfill standards set by themselves (Clance & Imes, 1978). This can have detrimental effects on the individual, such as issues with identity as a student, scholar, and professional.

The founders of this theory were Paulene Clance and Suzanne Imes, who worked together and coined the term ‘imposter phenomenon’ in 1978; however, in academic literature and casual conversations, it is more commonly known as ‘imposter syndrome’ (Clance & Imes, 1978; Bravata et al., 2020). Before their study, Clance and Imes felt that imposter syndrome mainly affected women (Rohrmann et al., 2016). This was seemingly confirmed in their study. Their study sought to investigate this phenomenon, showing that highly successful women feared failing. Even when faced with success, they attributed this to external qualities and situational factors such as luck (Clance & Imes, 1978). In comparison, men are likely to accredit their successes to internal and dispositional factors.

There are three core characteristics of imposter syndrome (Rohrmann et al., 2016). The first core feature is that the individual must feel as if they have fooled those around them into overestimating their ability. The second characteristic is attributing one’s success to external factors rather than intelligence or ability (Rohrmann et al., 2016). This is a protective mechanism from imposter syndrome itself, and it does not allow the individual to feel a sense of pride or relief but rather feelings of being a fraud. The last element is an intense fear of one day being exposed as a fraud (Rohrmann et al., 2016). This is more apparent when the individual is faced with a new task or challenge.

The use of this theoretical framework was crucial for the implementation and analysis of our research. This theory allowed us to define and utilize the research topic of our study. Additionally, the definition of imposter syndrome was utilized to create the questions within the survey to investigate the prevalence within undergraduate students at McMaster. As this concept was the main focus of our study, it provided us with the foundation for analyzing survey responses pertaining to feelings of academic inadequacy and fraudulence.

Intersectionality

Intersectionality allows us to observe the interconnections and interdependencies of varying social systems and categories (Atewologun, 2018). Utilizing this theory in research has become the prevailing method of visualizing the relationship between systems of oppression and social hierarchies of power (Carastathis, 2014). It offers researchers the understanding that a single process does not create the studied issues, but rather multiple systems. While this framework began exclusively in an anti-racial context and feminist movements, it has widely spread across many domains (Cho et al., 2013).

The term ‘intersectionality’ was coined by Kimberle Crenshaw in 1989 (Crenshaw, 1989). It was initially created as a metaphor but later elaborated as a provisional notion to conceptualize the relation between systems of oppression and the construction of multiple identities (Carastathis, 2014). Crenshaw observed how numerous systems exist in society that overlap and are often oppressive in nature. When these systems interact with one another, those in vulnerable positions are oppressed, forgotten, and abandoned (Crenshaw, 1989). Observing society through a single-axis framework ultimately diminishes the struggles these people face (Cho et al., 2013). Before Crenshaw coined the term, academic writings published during the political movement of Black women in the early 1980s used the term ‘intersections’ (Carastathis, 2014). This political movement drove Crenshaw to create this theoretical framework. Since then, it has spread across other domains such as history, sociology, philosophy, queer studies, and legal studies (Crenshaw, 1989).

This framework has four main principles: simultaneity, complexity, irreducibility, and inclusivity (Carastathis, 2014). Simultaneity argues all aspects of a person must be simultaneously evaluated rather than independent factors (Carastathis, 2014). Secondly, complexity describes the ways in which intersectionality can account for structural and experiential complexities that a monistic approach cannot describe. Irreducibility is derived from simultaneity and complexity (Carastathis, 2014). It states oppression comes from interactions between numerous factors. The final principle of inclusivity claims to bring visibility to possible elitism, ableism, heteronormativity, or other issues that may have been hidden with the monistic approaches of the past (Carastathis, 2014). These principles bring forth the intertwined categories of social institutions and lived experiences depicting intersectionality.

In our research project, intersectionality aided in analyzing the connections between gender identity and programs concerning imposter syndrome. It allowed us to observe other explanations for rates of imposter syndrome that we may not have thought of previously. Intersectionality was relevant to our research as it offered insight into the ways in which specific groups experience social institutions differently depending on intersections of identities. For the purpose of our research, we focused on how female-identifying individuals experience the educational institution of university based on the intersectionality of their gender identity and program. This framework was utilized in the analysis of our findings.

Methodology

Participants

To evaluate levels of imposter syndrome among STEM McMaster University students, we conducted an anonymous online survey through the MREB-approved program LimeSurvey. The research was approved by the McMaster Research Ethics Board (MREB#: 0327). Our questionnaire focused on female-identifying individuals and whether their experiences with the imposter phenomenon differ from non-female-identifying students. A purposive sampling technique was used to study a small subset of the larger population, undergraduate students at McMaster University. Our ideal sample size was a minimum of 75 participants across all faculties so that we could generalize our results to the McMaster student population. However, we were only able to recruit 44 survey participants. More specifically, we recruited female-identifying individuals in STEM, non-female-identifying individuals in STEM, and female-identifying and non-female-identifying individuals not in STEM from all levels through various platforms. Our team primarily recruited through social media by contacting McMaster student groups, program societies, and class Facebook groups. Upon receiving approval, our participant recruitment started on November 14, 2022, and ended on February 17, 2023, with data analysis following.

Lana Abdul Raheem emailed the following groups to post our recruitment poster on their social media pages: McMaster Humanities Society, DeGroote Commerce Society, McMaster Engineering Society, McMaster Science Society, McMaster Life Science Society, Health Sciences Society, McMaster Social Sciences Society, McMaster Kinesiology Society, McMaster Social Psychology Society, McMaster Anthropology Society, McMaster Economics Society, Health and Aging Society, McMaster Sociology Society, Psychology Neuroscience and Behaviour Society, The School of Earth Environment and Society Student Association, Labour Studies Student Association, McMaster Political Science Student Association, Social Work Student Collective, Society Culture and Religion Society, The Cooperative of Indigenous Students Studies and Alumni.

Materials

The materials within our survey consisted of 12 close-ended and 3-open ended questions. The survey was made accessible via LimeSurvey and was distributed to McMaster undergraduate students through recruitment over social media platforms to increase outreach. Our survey also included questions concerning demographic information, ethnography, and gender identity. Additionally, our survey featured a Likert scale system specific to our research to measure levels of imposter syndrome among students.

Procedure

Once the participants agreed to participate in the survey, they were directed to a questionnaire via the online LimeSurvey platform. First, the participants were presented with a Letter of Information specifying the research and data collection process and their rights to withdraw from the survey. The survey was accessible online through any technological device with internet access. Participants were then asked to sign a consent form detailing the confidentiality and anonymity agreement, stating that all participation is voluntary and that all collected information will remain anonymous before, during, and after data collection, giving participants the right to withdraw at any time before the survey submission. Upon reading the consent form, participants provided consent by clicking "Yes/I consent," confirming that they had read the consent form and were aware of the process, risks, and benefits of participating in the research. This survey posed no risks greater than those found in everyday life. Since the surveys were to remain anonymous, participants were informed that they could not withdraw after submission as it is impossible to trace the survey back to the correct participant. Participants were also informed that there are no penalties for withdrawal. The survey was estimated to take approximately 15 minutes to complete.

Data Analysis

The quantitative data was collected using a Likert scale and a frequency scale collected through the online platform LimeSurvey. The analysis of our results was conducted using the statistical software Jamovi. Responses were exported from LimeSurvey into an OMV file and imported into Jamovi. Our qualitative results were coded using a descriptive coding approach. Participants answered our survey questions, indicating whether they agreed or disagreed with the statements presented in the research survey. They also expressed how frequently they feel they have experienced a feeling or situation. We also included 3 open-ended questions that further detailed the participants' experiences with imposter syndrome. Furthermore, the demographic scale used in our survey was more specific and gave participants the option to describe their characteristics while maintaining anonymity.

Reflexivity and Positionality

Throughout our research process, we aimed to acknowledge our reflexivity by understanding our own social identities, recognizing how it impacts our lives, and acknowledging how our experiences differ from each other and the participants. Engaging in self-reflexivity allowed us to have varying viewpoints and perceptions of the world, which aided us when it came to analyzing the results of our research. As a group, we acknowledge our positionality. As university students of varying backgrounds, we may understand and relate to the experiences described by participants; however, we will not have experienced each element that participants have described, which can influence our choice of questions. We recognize the diverse backgrounds of our group members and our participant population and the varying ways in which gender identity can be perceived and identified. We understand that while we will be using our academic knowledge to communicate our questions and perceive our data accurately, we may not fully comprehend the different experiences of our participants as we all engage with gender identity in unique ways.

Ethical Considerations

Throughout our research process, we made sure to mitigate risks and concerns by implementing protocols every step of the way. However, while we have attempted to lower the number of risks that participants can encounter during our study, we recognize that most research studies still carry risks to those involved, despite protocols in place. A potential risk that participants may have encountered during the study is psychological harm. Some of our questions may be perceived as personal as individuals are asked to recount experiences of imposter syndrome and evaluate their justifications for their beliefs and actions. In asking questions that pertain to participants' lived experiences of imposter syndrome, it cannot be known what psychological impact this may have on them. Some questions may direct participants to recall moments when they felt anxious, unworthy, or unintelligent.

Questions regarding gender identity may cause feelings of distress as it questions the participant's relationship to their gender identity. As such, these questions may potentially cause negative emotions to resurface, causing them to feel embarrassed, ashamed, or judged. To mitigate these psychological risks, our researchers have created a survey with 12 close-ended questions and 3 open-ended questions. In this, there is a majority of close-ended questions to reduce anxiety about creating an answer but rather can select from several options. Psychological risks were further mitigated by allowing participants to skip any question and/or withdraw at any time before the survey submission.

In addition, there was also a possibility of social risks to privacy involved in participating in the survey. These social risks can be identified through participants' responses, which evoke personal identifiers. This can have negative social consequences, such as fear of exposure, as an individual experiences imposter syndrome. To combat this, we advised participants to complete the survey in a private, comfortable, and safe space. Additionally, participants were reminded and reassured of complete anonymity and confidentiality in their survey responses. The only possible scenario in which a participant may be identified through their responses is in answering open-ended questions wherein participants could include specific details from their personal life, such as a name or other identifiers. In this case scenario, our team would have addressed this by removing the submission from the data to protect their identity.

Challenges

As our research question examines the differences in experiences of imposter syndrome between female-identifying individuals in STEM compared to non-female-identifying individuals and those not in STEM, we required a diverse population that may be difficult to meet. Preferably, our population required the participation of female-identifying individuals in STEM, female-identifying individuals outside of STEM, non-female-identifying individuals in STEM, and non-female-identifying individuals outside of STEM, all of which come from diverse demographics. Given the inherent need for diversity in our research, it was difficult to predict the recruitment process. A great deal of the challenges we faced arose from difficulty in gathering participants who are female-identifying individuals in STEM, female-identifying outside of STEM, female-identifying individuals in STEM, and female-identifying individuals outside of STEM.

Another challenge we faced was student engagement and recruiting individuals who were willing to participate in our study. Our primary method of promoting the survey was reaching out to student groups, university societies, and posting on LimeSurvey. This was a challenge, as we found difficulty in having student groups and societies advertise our study. Navigating recruitment was a challenge; however, we took preventative measures to ensure the proper protocols were in place to maintain the integrity of the research.

Another challenge we faced was the possibility of response bias from the participants. Despite the anonymity of the survey, respondents may engage in a social desirability bias to present themselves to be viewed favourably by others. Participants may also have answered in accordance with their interpretation of the desired outcomes of the research, for example, exaggerating their responses to exemplify imposter syndrome.

Apart from data collection challenges, data analysis introduced its own set of challenges. The primary challenge during the data analysis phase was internal biases affecting how we interpreted the data. To combat this, we added open-ended questions to our survey to ensure respondents had a sense of control over the ways in which their narratives were interpreted within the analysis.

Summary of Methodology

In summation, we developed a survey including quantitative and qualitative portions to answer our main research question. Our sample size was 44 undergraduate McMaster students recruited mainly through student groups. Our results were analyzed using the statistical software Jamovi, and our qualitative data were coded using a descriptive coding method.

Results

Sociodemographics

Our research study had a sample size of 45 McMaster undergraduate students. One of the responses was deleted as their answers were submitted with malintent, which may have skewed our results. Our final sample size consisted of 44 McMaster undergraduate students over 18 years of age (n=44). The demographic questions pertained to their study year, faculty, age, gender identity, and ethnicity.

Year of Study

The first demographic question asked respondents what year of University they were in. Responses included undergraduate year one, undergraduate year two, undergraduate year three, undergraduate year four, and undergraduate year five. Figure 1 shows that the majority of our participants were in their fourth year (58.1%). 16.3% of participants stated they were in their second year, 11.6% in their third year, 9.3% in their fifth year, and 4.7% in their first year.

Figure 1

Frequencies of Year

Levels	Counts	% of Total
Undergraduate Year One	2	4.7%%
Undergraduate Year Two	7	16.3%
Undergraduate Year Three	5	11.6%
Undergraduate Year Four	25	58.1%
Undergraduate Year Five	4	9.3%

Faculty

The second demographic question inquired about which faculty they studied in at McMaster University. As seen in figure 2, the Faculty of Social Sciences is where most of our participants study (40.9%). The second highest was the Faculty of Science (27.3%), followed by Faculty of Engineering (18.2%), Faculty of Humanities (4.5%), DeGroote School of Business (4.5%), and lastly, the Faculty of Health Sciences (2.3%).

For the purpose of this research, we have categorized the Faculty of Health Sciences, the Faculty of Science, and the Faculty of Engineering as STEM programs, and have categorized the Faculty of Humanities, the Faculty of Social Sciences and the DeGroote School of Business as non-STEM programs. Figure 3 demonstrates that 47.7% of participants were in STEM, and 52.3% of participants were not in STEM.

Figure 2
Frequencies of Faculties

Levels	Counts	% of Total
DeGroote School of Business	2	4.5%%
Faculty of Engineering	8	18.2%
Faculty of Health Sciences	1	2.3%
Faculty of Humanities	3	6.8%
Faculty of Science	12	27.3%
Faculty of Social Sciences	18	40.9%

Figure 3
Frequencies of STEM versus Non-STEM

Levels	Count	% of Total
STEM	21	47.7%
Non-STEM	23	52.3%

Age

Our next demographic question had participants state their age from a range of 18-24, or 25+. Figure 4 shows that almost half of our participants were 21 years old (45.5%). The next being 20 years old (15.9%) and 22 years old (15.9%). Followed by 19 years old (13.6%), 18 years old (4.5%), 23 years old (2.3%) 25+ (2.3%), and lastly, no participant stated they were 24 years old.

Figure 4
Frequencies of Age

Levels	Counts	% of Total
18	2	4.5%
19	6	13.6%
20	7	15.9%
21	20	45.5%
22	7	15.9%
23	1	2.3%
24	0	0.0%
25+	1	2.3%

Gender Identity

Participants were asked in an open-ended question which gender they identified with, including an option to skip it if they were uncomfortable answering. Answers included responses such as 'biological female', 'female', and 'woman'. These were grouped into one category titled "female". As demonstrated in Figure 5, 81.8% of participants self-identified as female, 11.4% self-identified as male, 2.3% self-identified as nonbinary/demigender, 2.3% responded cisgender, and 2.3% of participants did not respond.

Figure 5
Frequencies of Gender

Levels	Counts	% of Total
Female	36	81.8%
Male	5	11.4%
Non-Binary/Demigender	1	2.3%
Cisgender	1	2.3%
No Response	1	2.3%

For the purpose of our research, we have grouped everyone into 'female-identifying individuals' and 'non-female-identifying individuals'. Female-identifying individuals include those that responded 'biological female', 'female', and 'woman'. Non-female-identifying individuals included those that responded 'male', 'nonbinary/demigender', and 'cisgender'. As shown in Figure 6, 81.8% of participants will be analyzed as female-identifying individuals, and 15.9% of participants will be analyzed as non-female-identifying individuals.

Figure 6
Frequencies of Female-Identifying versus non-female-identifying

Levels	Count	% of Total
Female-Identifying	36	81.8%
Non-Female-Identifying	7	15.9%
No Response	1	2.3%

Ethnicity

In the last demographic question, we asked participants to write in the ethnicity they identify with most. Any answer that is a variation of 'white' or 'Caucasian' is grouped into the category 'Caucasian'. Answers including 'Chinese', 'Filipino', 'Taiwanese', and 'HongKongese' are grouped into the category 'East Asian'. Responses including 'Mixed' and 'White/Asian' were placed into the category 'Other'. As seen in Figure 7, the majority of our participants identify as Caucasian (63.6%). This was followed by South Asian (13.6%), East Asian (6.8%), Middle Eastern (4.5%), Other (4.5%), and lastly, Latin America (2.2%). 4.5% of participants chose not to answer this question.

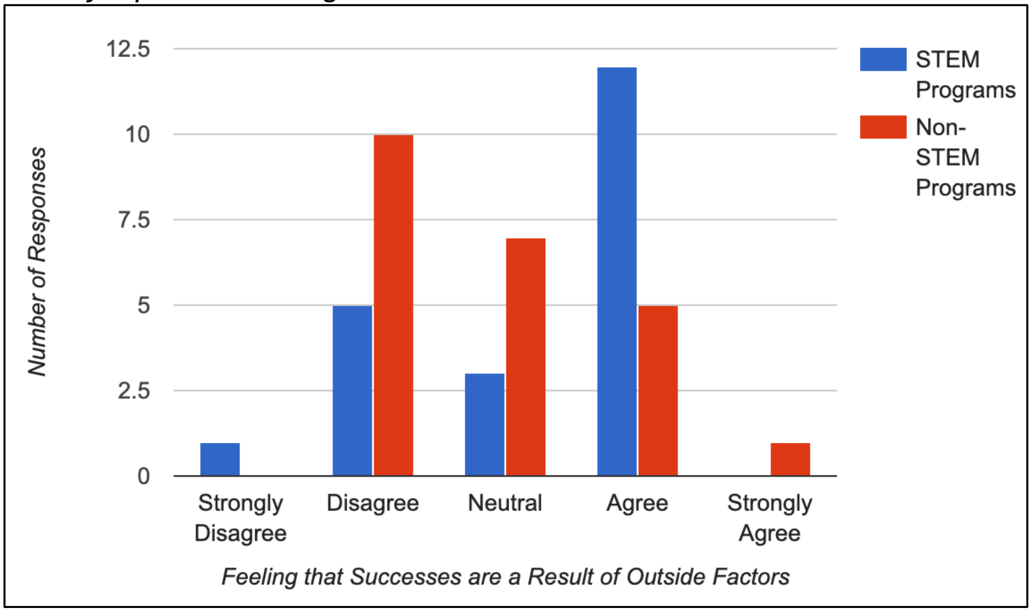
Figure 7
Frequencies of Ethnicity

Levels	Counts	% of Total
Caucasian	28	63.6%
Latin America	1	2.2%
East Asian	3	6.8%
Middle Eastern	2	4.5%
South Asian	6	13.6%
Other	2	4.5%
No Response	2	4.5%

Quantitative Results

This section outlines the results of our 12 close-ended questions, showing results categorized by STEM versus non-STEM programs, as well as for female-identifying versus non-female-identifying. The main purpose of these questions was to observe feelings of inadequacy and fraudulence within our two selected demographics. Responses to our questions included a 5-point Likert scale where 'strongly disagree' or

Figure 8a
Faculty-Specific Feelings that Successes are a Result of Outside Factors

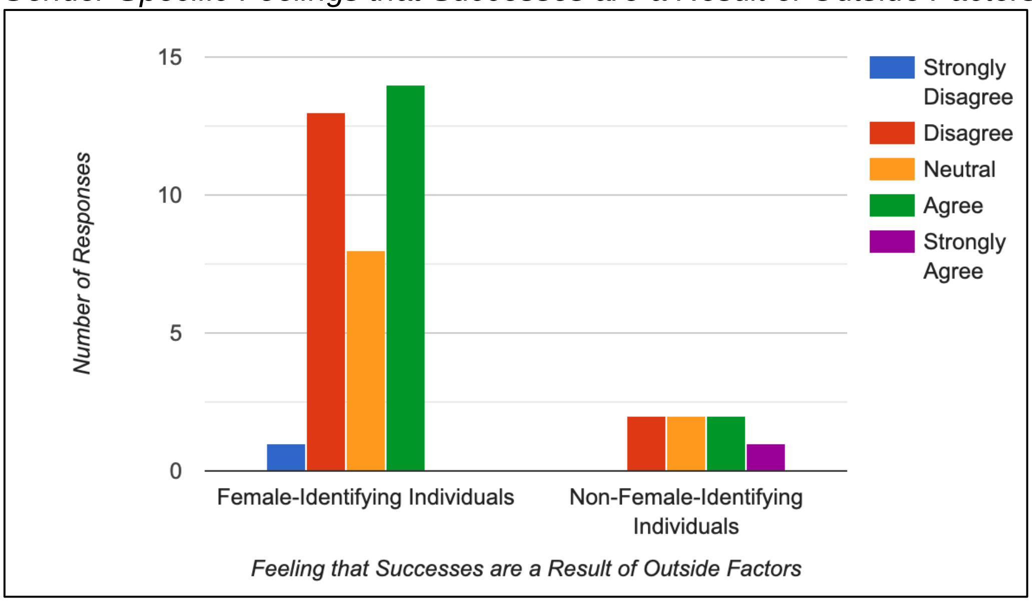


'never' indicated lower rates of imposter syndrome, and 'strongly agree' and 'always' indicated higher rates of imposter syndrome. Our sample size showed a fairly even distribution for STEM versus non-STEM programs; however, the majority of our participants were female-identifying which may skew the results in relation to gender. The following figures will show responses split by the two categories for each question, followed by the means, and lastly, t-tests and a correlation matrix to test for statistical significance.

Figures 8a and 8b indicate participants' feelings that their successes and accomplishments were a result of outside factors, such as luck. When observing faculty, results show that STEM programs are more likely to attribute successes to external factors. As for gender, non-female-identifying individuals showed a higher likelihood of attributing successes to external factors, but this is only slightly observed.

Figure 8b

Gender-Specific Feelings that Successes are a Result of Outside Factors

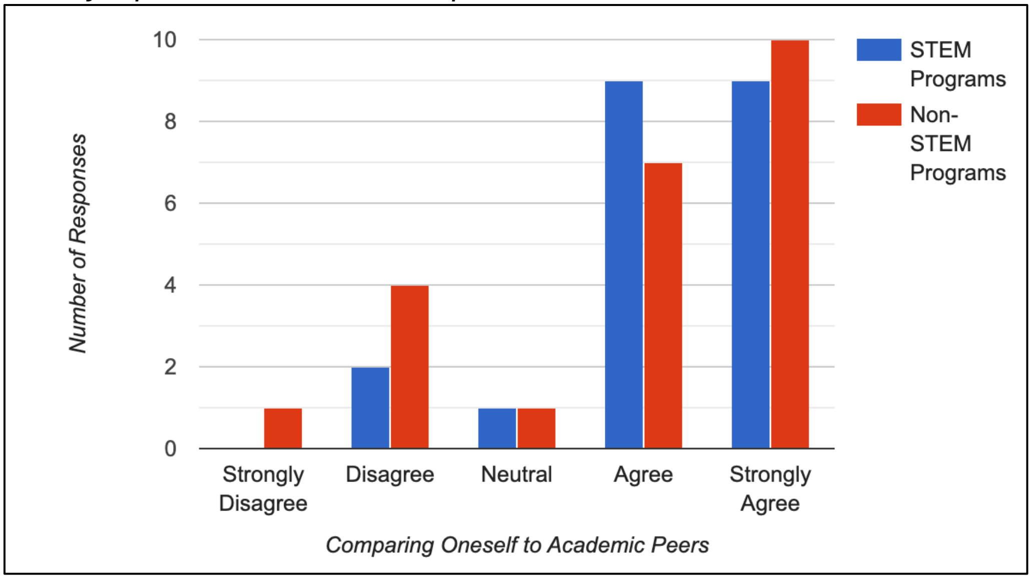


Figures 9a and 9b show results of academic comparison amongst peers and thoughts that others are more capable and more intelligent than they are. For faculty, results are similarly high for both STEM and non-STEM programs, with STEM portraying slightly higher rates of academic comparison. For gender, both female-identifying individuals and non-female-identifying individuals show a similar trend of higher academic comparison.

Figures 10a and 10b portray participants' thoughts that they could always work harder and devote more time to their work, despite their work ethic and past successes. Both STEM and non-STEM had a majority answer 'strongly agree', with non-STEM answering slightly higher with 69.5% of participants compared to STEM's 61.9%. Gender showed a similar trend with 71.4% of non-female-identifying individuals and 66.6% of female-identifying individuals answering, 'strongly agree'.

In Figures 11a and 11b, we observe responses based on how strongly participants agree with the statement 'I am rarely satisfied with my accomplishments and often believe I could have performed better'. Non-STEM participants showed higher rates of this, with

Figure 9a
Faculty-Specific Academic Comparison



more answering ‘agree’ or ‘strongly agree’ than STEM programs. For gender, non-female-identifying individuals displayed a higher likelihood of being dissatisfied with their accomplishments.

This question sought to find out if participants avoided tasks and assignments out of fear of failure. Figure 12a shows that both STEM and non-STEM programs have relatively similar responses. There is approximately an even number of responses of ‘disagree’ and ‘strongly agree’, indicating a discrepancy in attitudes. Figure 12b shows that non-female-

Figure 9b
Gender-Specific Academic Comparison

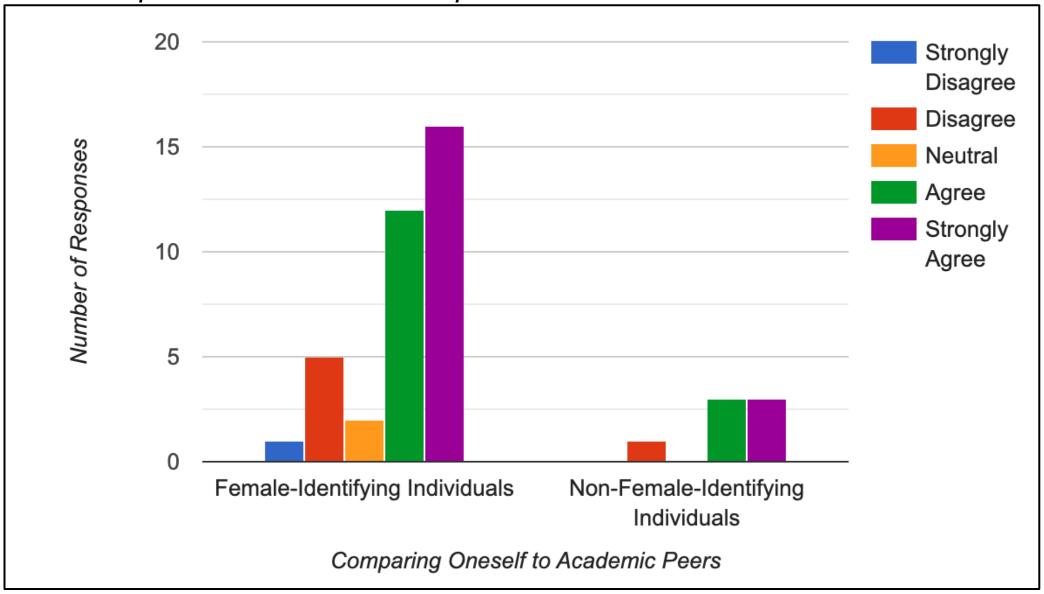
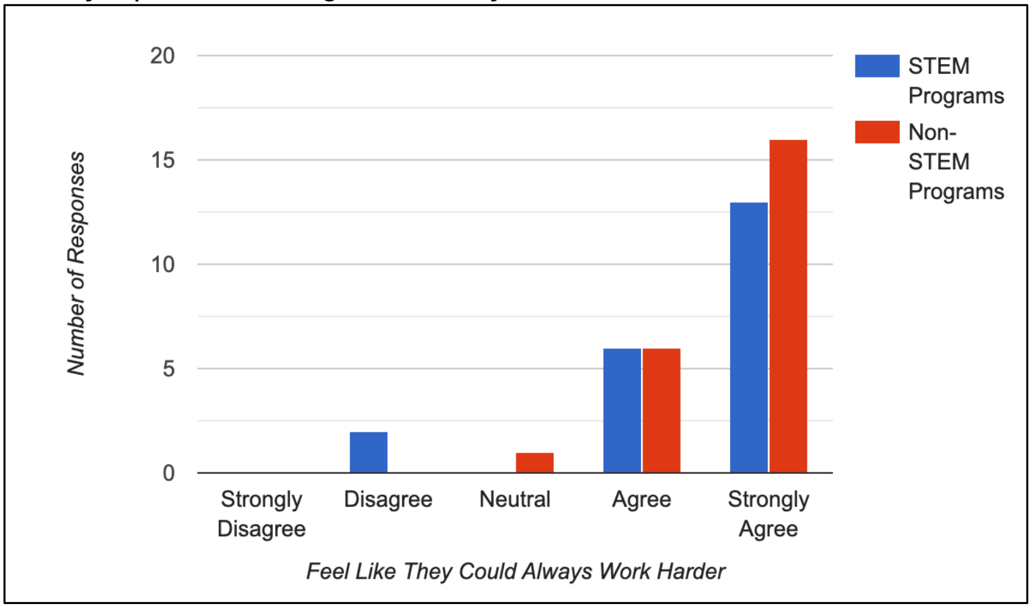


Figure 10a
Faculty-Specific Feelings That They Could Work Harder



identifying individuals rate higher task avoidance, whereas almost half of female-identifying individuals rate lower on task avoidance.

Figures 13a and 13b portray whether participants worry that their peers may discover that they are not intelligent and do not deserve a place as a student at McMaster University. STEM programs responded at significantly higher rates, with 71.4% of participants answering 'agree' or 'strongly agree', compared to 47.8% of non-STEM programs. Female-identifying individuals and non-female-identifying individuals showed similar results, with 'agree' being the most chosen response.

Figure 10b
Gender-Specific Feelings That They Could Work Harder

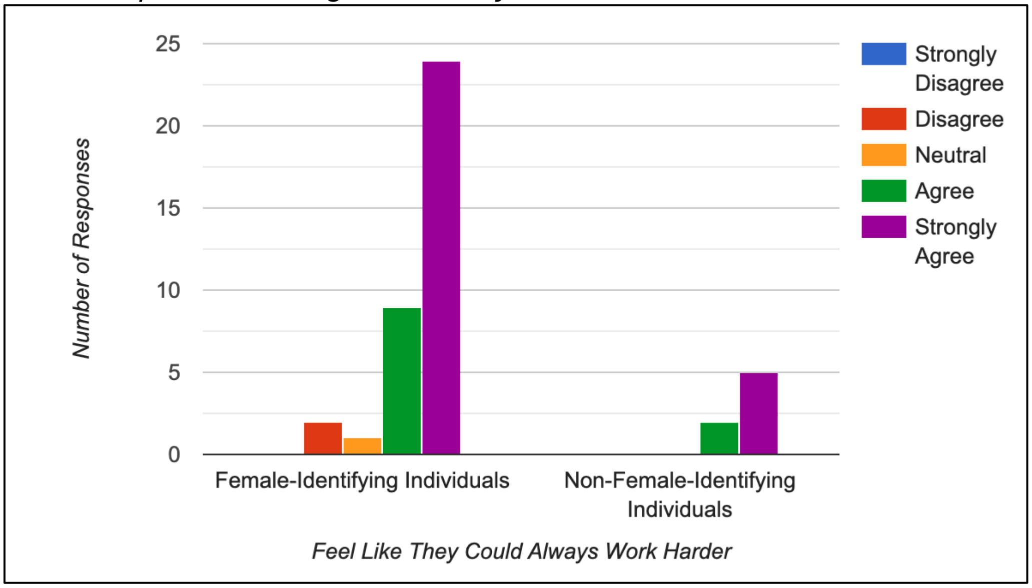
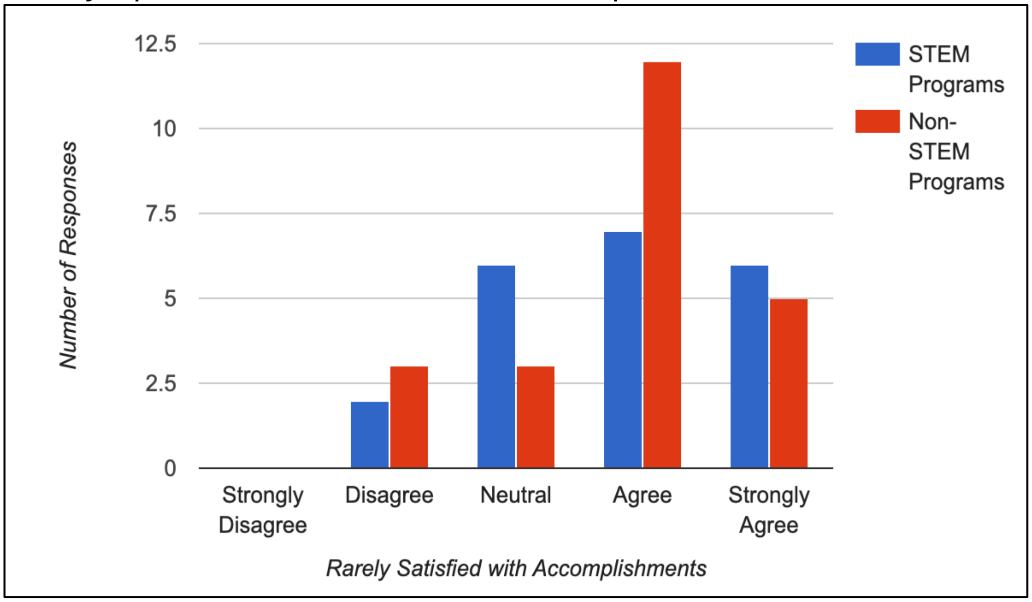


Figure 11a

Faculty-Specific Dissatisfaction with Accomplishments



Figures 14a and 14b represent how often participants do not feel worthy of praise or recognition when they receive acknowledgement for their accomplishments. Almost half of the participants for STEM and non-STEM programs answered ‘sometimes’, indicating that they are neutral to these feelings. Gender showed similar results as faculty, with almost half of female-identifying individuals and non-female-identifying individuals responding, ‘sometimes’.

Figure 11b

Gender-Specific Dissatisfaction with Accomplishments

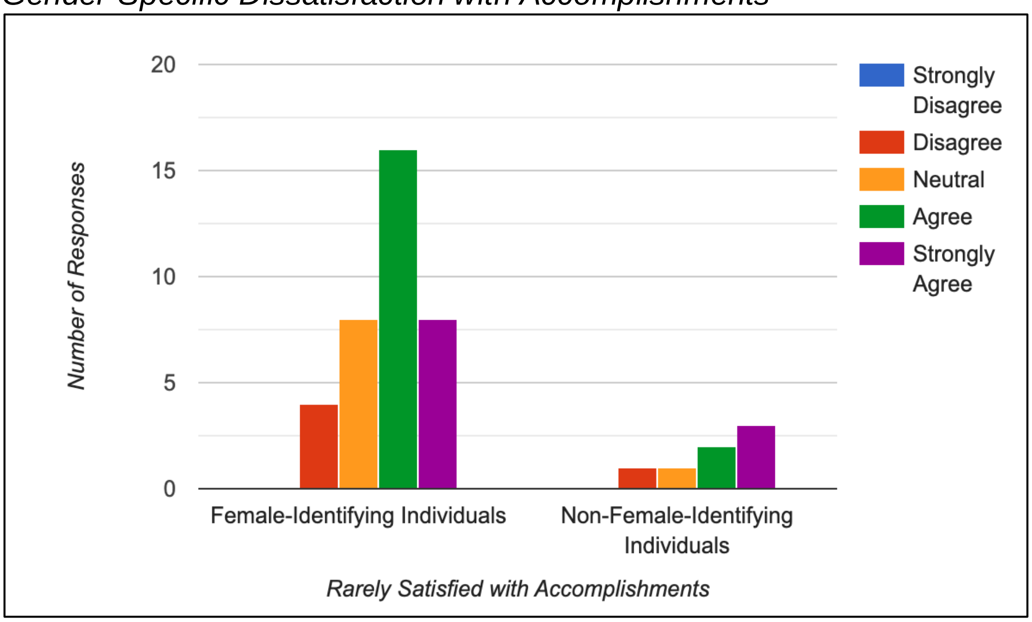
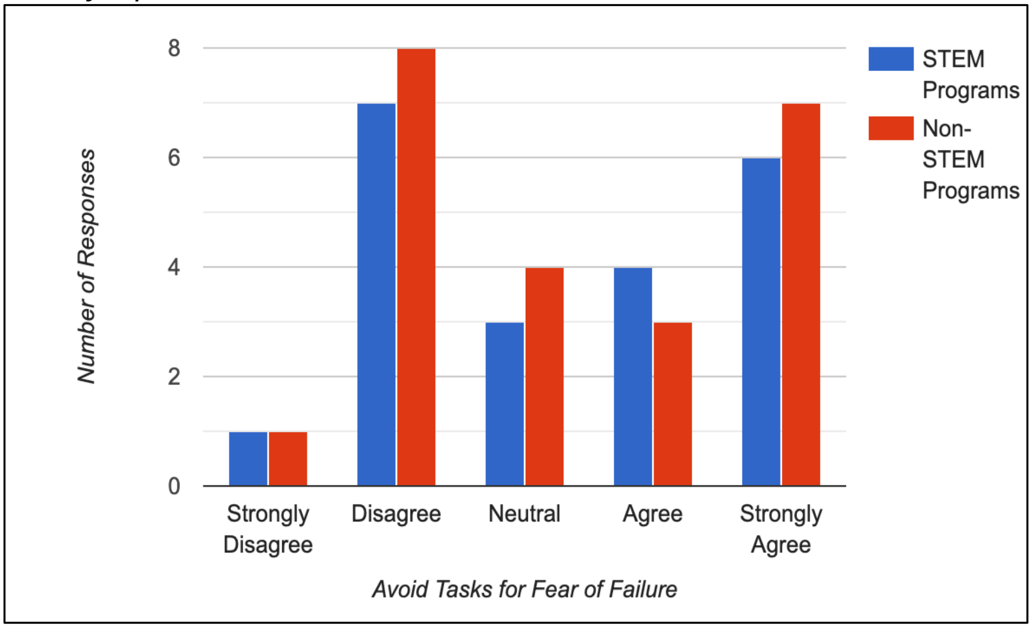


Figure 12a
Faculty-Specific Rates of Task Avoidance



The next question in our survey asked participants if they worry about maintaining their level of success once they succeed at a task. Figure 15a demonstrates that non-STEM programs worry about maintaining their levels of success more often than STEM programs; however, this is minimal as both STEM and non-STEM answered ‘often’ or ‘always’ at a relatively high frequency. Figure 15b illustrates that non-female-identifying individuals record a higher rate of worrying about maintaining their success.

Figure 12b
Gender-Specific Rates of Task Avoidance

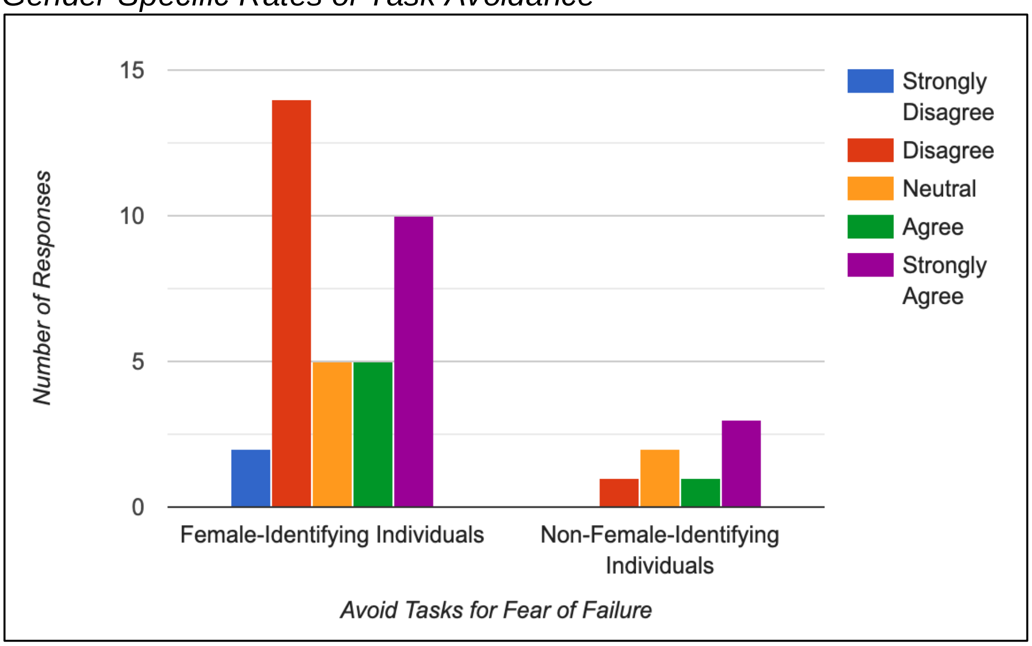
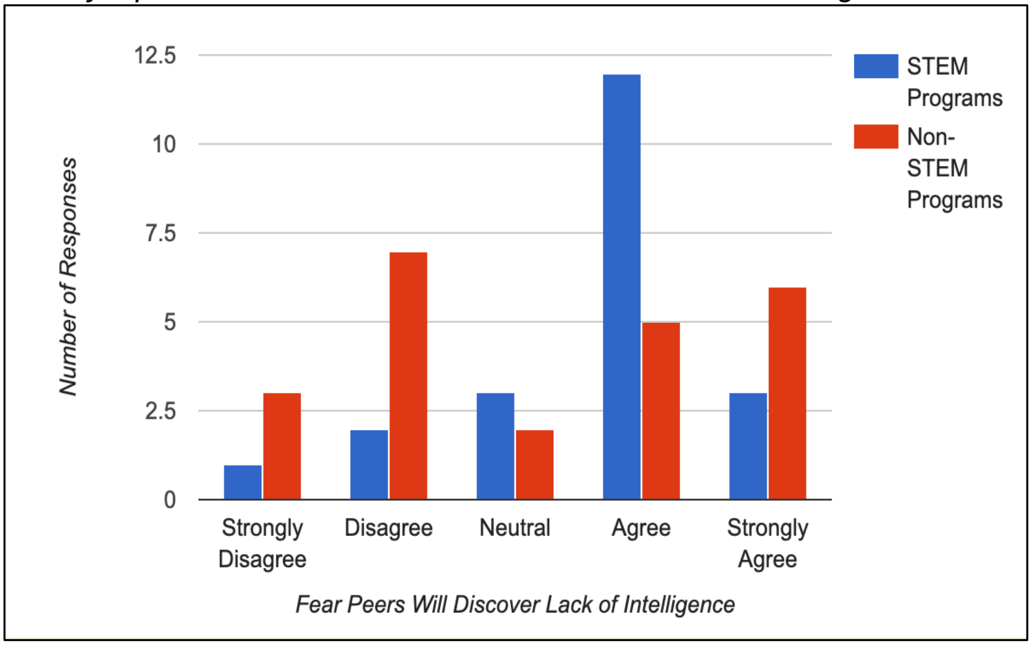


Figure 13a

Faculty-Specific Fear that Peers will Discover Lack of Intelligence



Figures 16a and 16b exhibit how often participants recall their failures more often than their successes. Figure 16a represents that STEM programs recall failures more often than not. Non-STEM programs were the only participants to answer ‘never’ and ‘rarely’ for this question. Figure 16b shows that the majority of female-identifying individuals and non-female-identifying individuals recall their failures.

Figure 13b

Gender-Specific Fear that Peers will Discover Lack of Intelligence

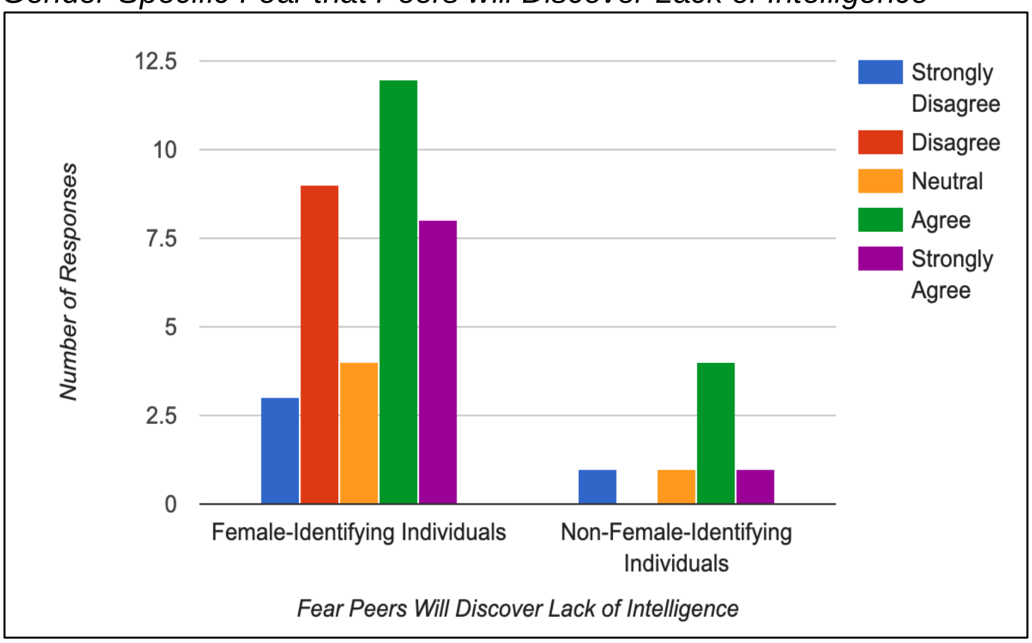
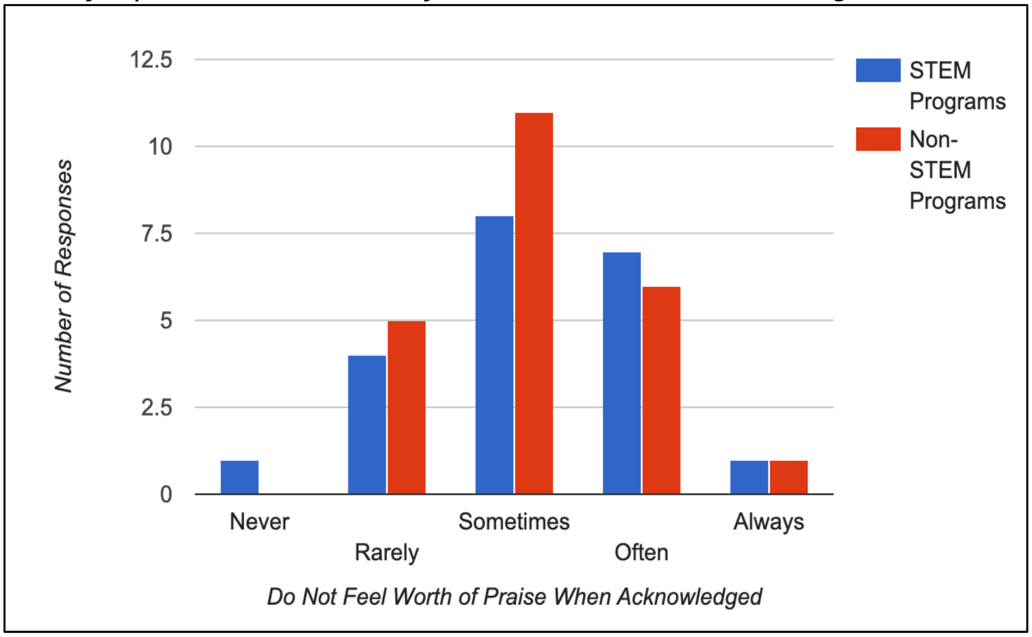


Figure 14a

Faculty-Specific Feel Unworthy of Praise When Acknowledged for Accomplishments



Our next question asked participants if they focus more on the praise and recognition they obtain for their successes, rather than the importance of the task. Figure 17a presents the result that non-STEM programs rank higher than STEM programs in their focus on praise. Figure 17b presents the result that female-identifying individuals score higher than non-female-identifying individuals in their focus on praise.

Figure 14b

Gender-Specific Feel Unworthy of Praise When Acknowledged for Accomplishments

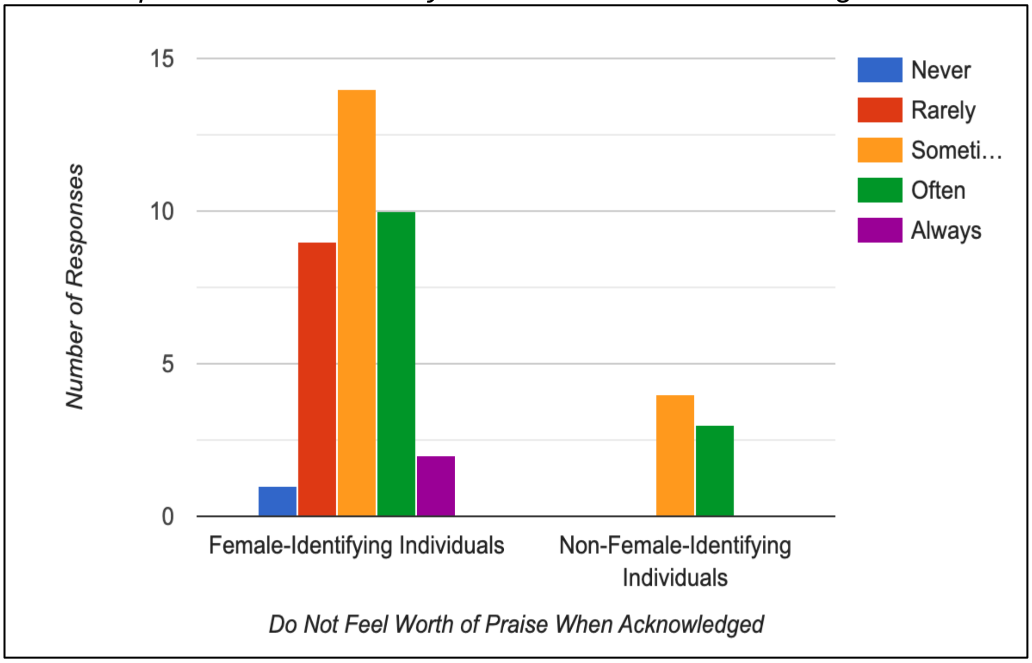
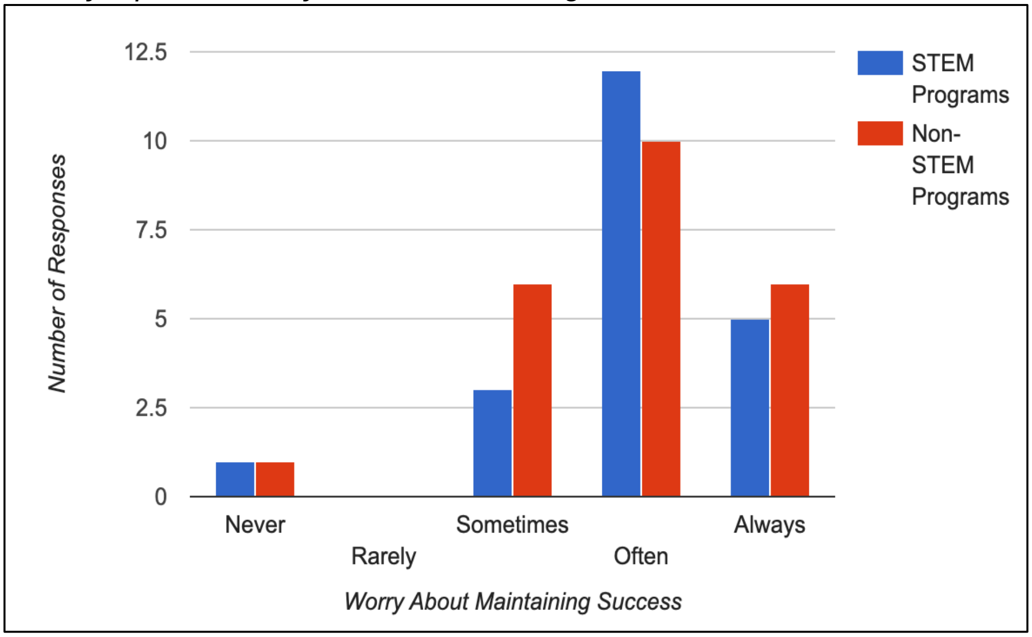


Figure 15a

Faculty-Specific Worry about Maintaining their Success



Figures 18a and 18b portray how often participants search for academic validation from their mentors, such as Teaching Assistants and Professors. Non-STEM programs state that they seek academic validation more often, with 5 participants answering ‘always’, and 1 participant answering ‘always’ for STEM programs. Female-identifying individuals were more likely to seek academic validation, with 6 participants responding ‘always’, and no participants answering ‘always’ for non-female-identifying individuals.

Figure 15b

Gender-Specific Worry about Maintaining Success

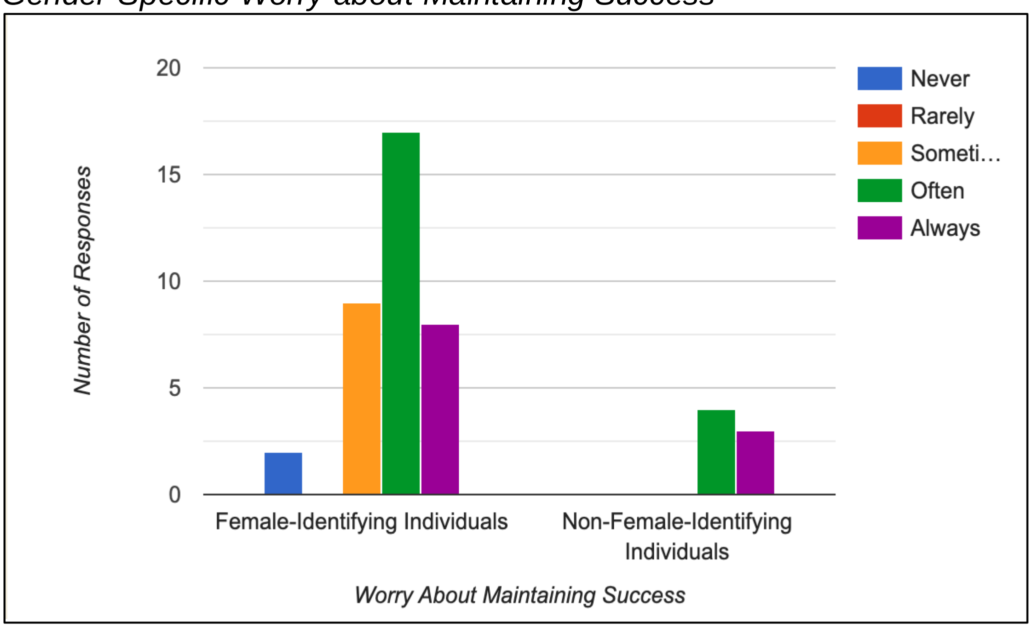
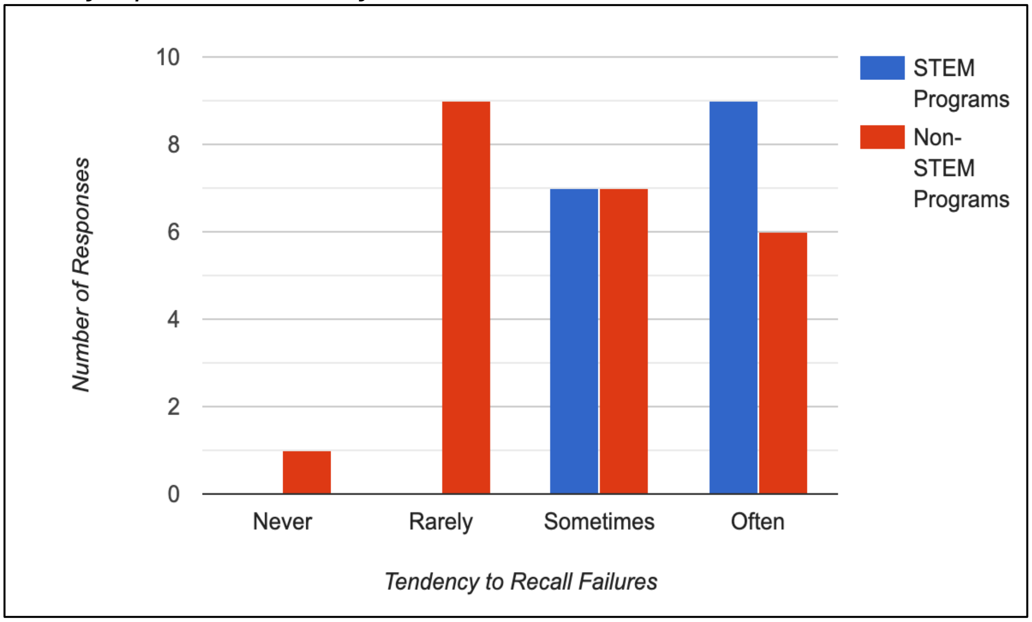


Figure 16a

Faculty-Specific Tendency to Recall Failures More than Successes



Our last close-ended question asked participants if they feel stressed, worried, or overwhelmed about being able to complete and succeed at a task when a new assignment is presented. Figure 19a shows that both STEM and non-STEM programs do this often; however, non-STEM programs report these feelings more often. Figure 19b shows that female-identifying individuals feel overwhelmed at the thought of being able to succeed at a new task more often than non-female-identifying individuals.

Figure 16b

Gender-Specific Tendency to Recall Failures More than Successes

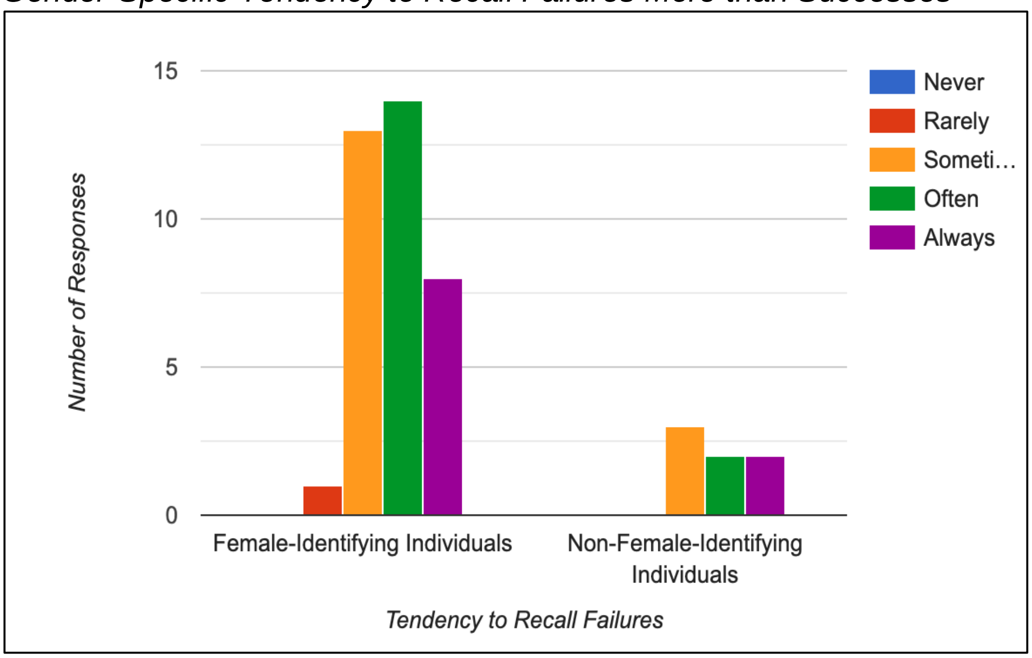
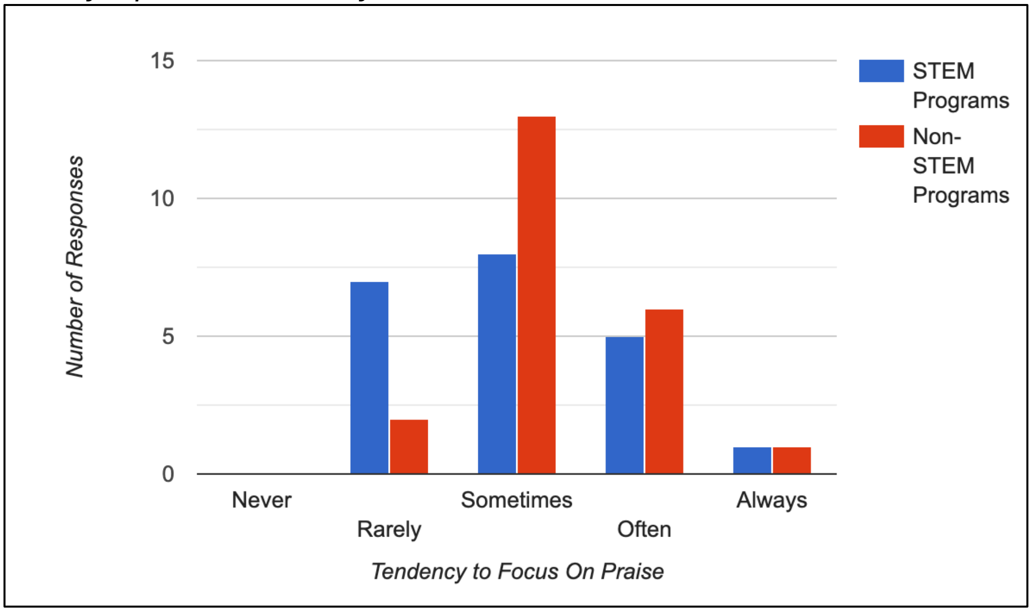


Figure 17a
Faculty-Specific Tendency to Focus on Praise



To determine the rates of Imposter Syndrome across McMaster University faculties, as well as within female-identifying individuals and non-female-identifying individuals across McMaster University, we calculated the mean of responses for the close-ended questions. A lower value (1) indicates lower rates of imposter syndrome, and a higher value (5) indicates higher rates of imposter syndrome. Figure 20a shows the rates of imposter syndrome across faculty. The Faculty of Health Sciences exhibits the highest rates of imposter syndrome, with an average of 3.92. DeGroote School of Business

Figure 17b
Gender-Specific Tendency to Focus on Praise

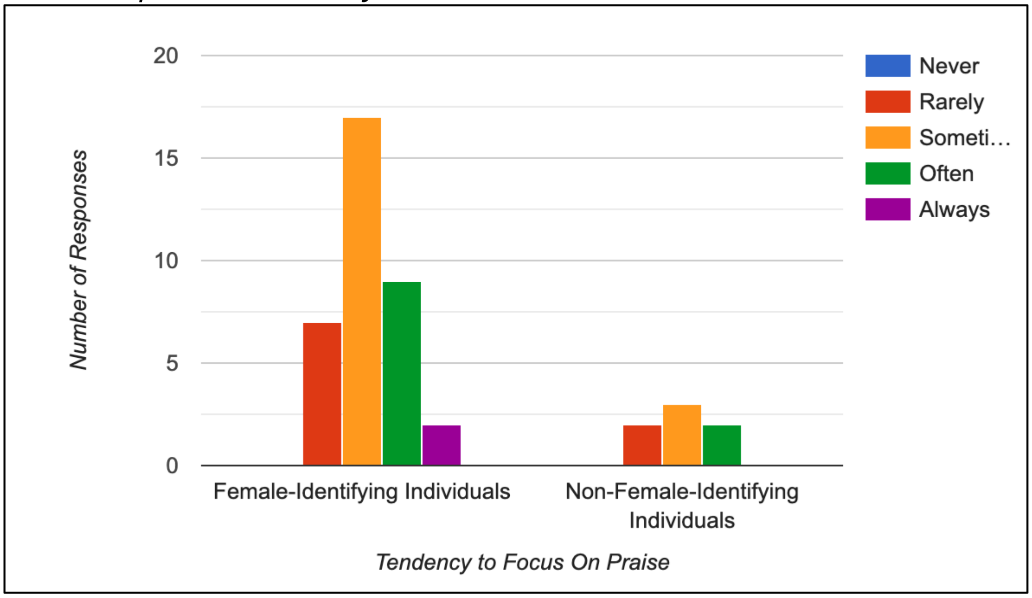
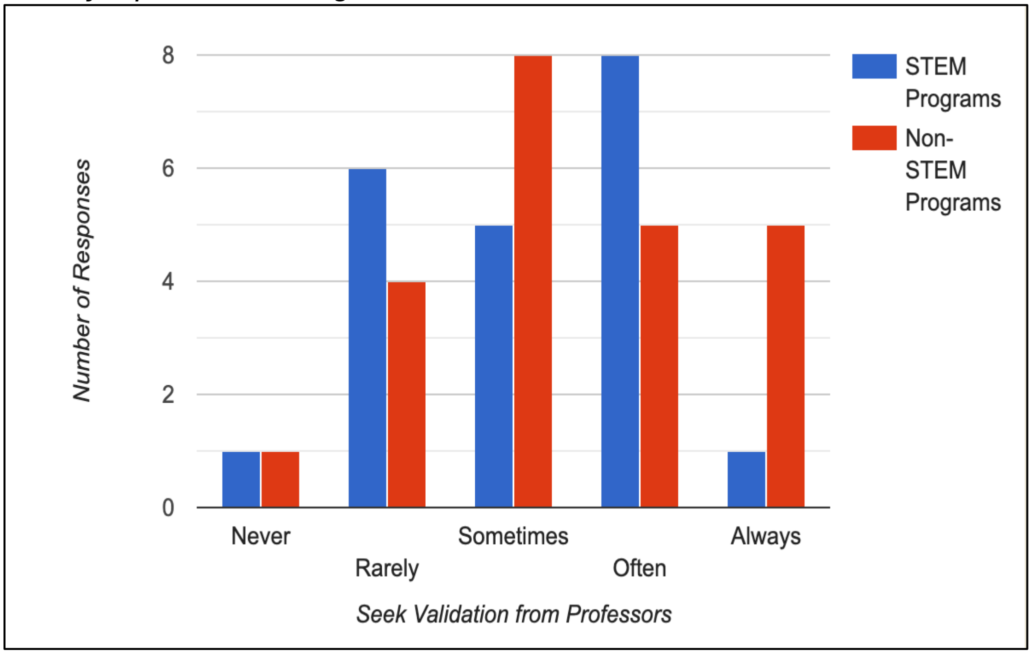


Figure 18a

Faculty-Specific Seeking Validation from Mentors



exhibits the lowest rates of imposter syndrome, with an average of 3.42. Figure 20b shows the rates of imposter syndrome, comparing STEM and non-STEM programs specifically. STEM portrays higher rates of imposter syndrome, but only slightly. This indicates that every faculty has similarly high rates of imposter syndrome.

Figure 18b

Gender-Specific Seeking Validation from Others

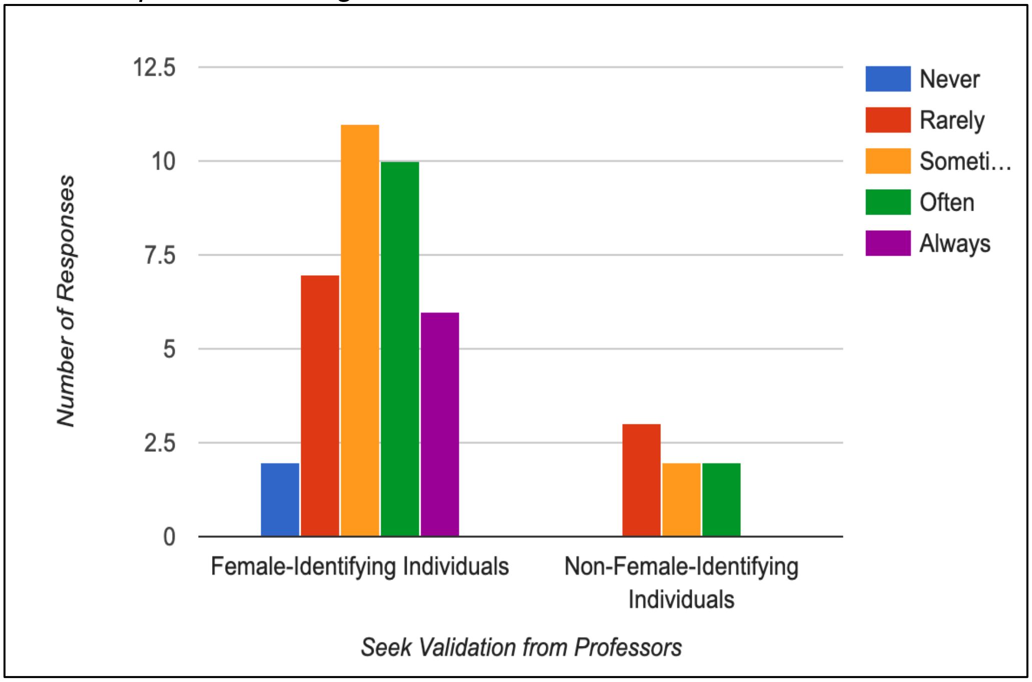


Figure 19a

Faculty-Specific Feeling Overwhelmed When Given a New Task

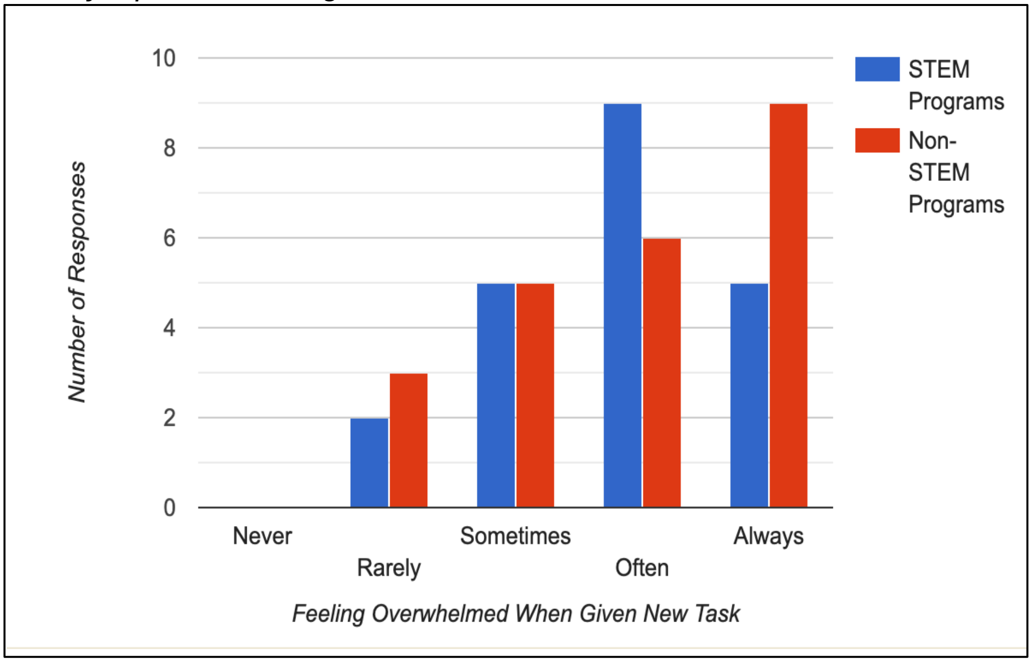


Figure 21 portrays the rates of imposter syndrome, comparing female-identifying individuals and non-female-identifying individuals. This figure shows that non-female-identifying individuals exhibit higher rates of imposter syndrome with a mean of 3.77, compared to 3.57 exhibited by female-identifying individuals. Although they are rated higher, these differences are minimal.

Figure 19b

Gender-Specific Feeling Overwhelmed When Given a New Task

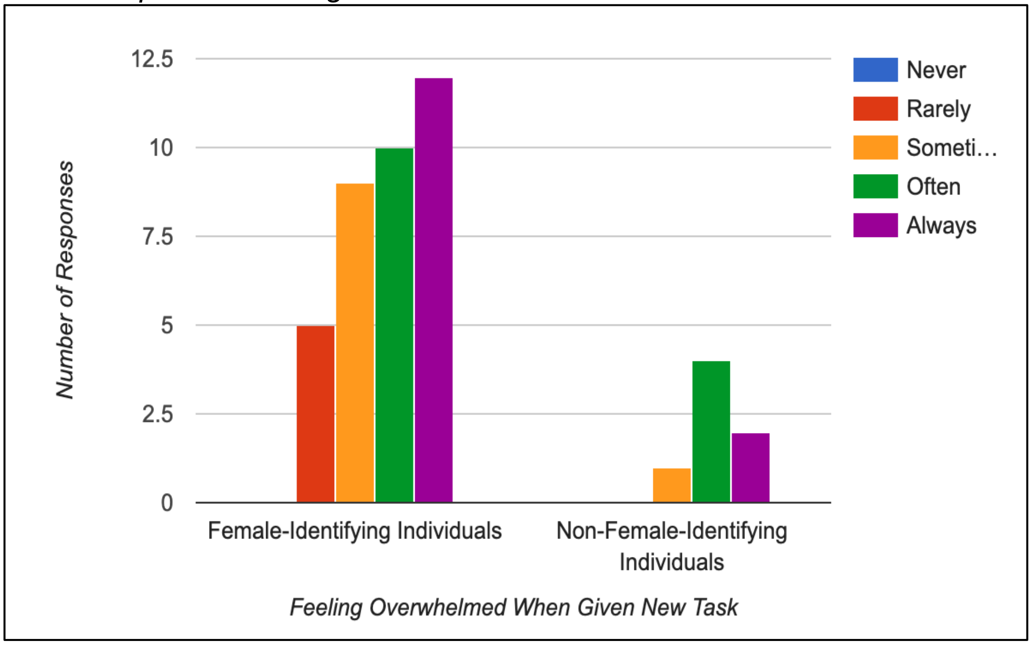


Figure 20a

Rates of Imposter Syndrome across McMaster University Faculties

	Faculty	Rate of Imposter Syndrome
Mean	DeGroote School of Business	3.42
	Faculty of Engineering	3.61
	Faculty of Health Sciences	3.92
	Faculty of Humanities	3.89
	Faculty of Science	3.60
	Faculty of Social Sciences	3.58

To test if there is a correlation between imposter syndrome and faculty, as well as for gender, we conducted a correlation analysis. Additionally, we tested for statistical significance using an independent sample t-test. Figure 22 shows the results of the correlation tests, and the results of the t-test for faculty combined into one table. The Pearson correlation coefficient (r) shows that there is almost no correlation between imposter syndrome and STEM programs. The Pearson's r value 0.008 is a positive value, indicating a positive correlation; however, the value is relatively close to zero, so this correlation is insignificant. The results of the independent sample t-test show that the p-value is 0.957. Since this value is greater than 0.05, this is not statistically significant, indicating no relationship between imposter syndrome and STEM programs.

Figure 20b

Rates of Imposter Syndrome across McMaster University Faculties Categorized by STEM and Non-STEM

	Faculty	Rate of Imposter Syndrome
Mean	STEM Programs	3.71
	Non-STEM Programs	3.63

Figure 21

Rates of Imposter Syndrome within Female-Identifying and Non-Female-Identifying Individuals across McMaster University

	Female VS Non-Female	Rate of Imposter Syndrome
Mean	Female-Identifying	3.57
	Non-Female-Identifying	3.77

Figure 22

Faculty-Specific Results of the Correlation Matrix and T-Tests

	Pearson's r	df	p-value	Faculty	Mean	SD	SE
Rates of Imposter Syndrome	0.008	41.0	0.957	-	-	-	-
				STEM Programs	3.71	0.545	0.119
				Non-STEM Programs	3.63	0.564	0.120

Figure 23 shows the results of the correlation analysis and the results of the t-test for gender combined into one table. The Pearson correlation coefficient (r) for gender shows a slight negative correlation between imposter syndrome and female-identifying individuals, with a Pearson's r value of -0.136. The results of the independent sample t-test show that the p-value is 0.389. Since this value is greater than 0.05, this is not statistically significant, indicating no relationship between imposter syndrome and female-identifying individuals.

Figure 23

Gender-Specific Results of the Correlation Matrix and T-Tests

	Pearson's r	df	p-value	Gender	Mean	SD	SE
Rates of Imposter Syndrome	-0.136	40.0	0.389	-	-	-	-
				Female-Identifying	3.57	0.561	0.0948
				Non-Female-Identifying	3.77	0.515	0.195

Qualitative Results

To gain a better understanding of how students at McMaster University feel about their academic achievement, we used an open-ended question model and a descriptive coding method to examine the specific feelings these individuals may have. Our qualitative analysis used three open-ended questions to understand students' feelings about their academic achievement and to see if students attributed their success to internal or external factors. Those who associate their success with their own personal work or internal factors are less likely to experience imposter syndrome (Clance & Imes, 1978). Using 44 responses, we categorized students into four different groups, female-identifying individuals in STEM, female-identifying individuals not in STEM, non-female-identifying individuals in STEM, and non-female-identifying individuals not in STEM.

Receiving Grades

Question one asked students to explain how they feel when they receive a good grade on an assignment. We categorized the responses into three categories, feeling positive emotions, feeling negative emotions, and feeling a mix of both positive and negative emotions. Out of 44 students who completed this survey, 41 responded to this question. The majority of female-identifying individuals in STEM claimed to feel positive emotions only, and few female-identifying individuals in STEM claimed to feel a mix of both positive and negative emotions.

There were no responses from female-identifying individuals in STEM that were strictly negative emotions. The question which was asked on the survey is as follows: in the space provided below, please explain how you feel when you receive a good grade on an assignment. Examples of the positive only responses we received are as follows:

- “I feel excited as my hard work paid off!”
- “I feel as if I am a valuable and worthy person. It makes me feel as if I deserve my place at McMaster and that I am succeeding as a university student.”

Furthermore, examples of the mix of both positive and negative responses we received are as follows:

- “I feel proud of myself for getting a good mark but I always have a voice in the back of my head that tells me I don't deserve the grade for different reasons…”
- “First I feel relieved and proud and then I wonder where I went wrong and how I could’ve done better.”

In comparison to female-identifying individuals in STEM, the majority of student participants in other groups resulted in similar feelings and responses. Most female-identifying individuals not in STEM programs felt positive emotions only when answering this question, and few felt a mix of both positive and negative emotions. However, within this category, very few responses showed only negative emotions. Examples of the negative only responses we received are as follows:

- “I’ve noticed that I don’t feel proud like I used to feel in high school. Sometimes I think it’s just because of luck but when I do get a ‘bad’ mark I always say negative things about myself.”
- "Overwhelmed because I feel as though I have to up my standards and replicate that grade, so the pressure is higher.”

Each of these responses provides us with a clear understanding of how individuals believe their grades are distributed and where they believe can be improved. Overall, many individuals feel proud of their grades and a sense of accomplishment in their academics.

Acceptance into Undergrad

The second question asked students to identify the factors they believe played a significant role in their acceptance into McMaster University for their undergraduate program. Each response was categorized into four different themes. These themes were then further categorized into two groups: internal and external factors. The initial themes were grades, academic motivation, grade inflation due to the Covid-19 pandemic, and luck. We categorized academic motivation as the internal factor and categorized grades, grade inflation and luck as external factors. Out of 44 students, there were only 41 responses to this question. The question which was asked stated: What do you think your acceptance into McMaster was based on?

The submitted responses to this question show that the majority of female-identifying individuals in STEM attribute their acceptance into McMaster University to external factors such as their grades, grade inflation, and luck. This shows that most female-identifying individuals experience feelings of imposter syndrome in relation to their sense of belonging at McMaster University. Similar results were found with all other groups. Most of the female-identifying individuals not in STEM and non-female-identifying individuals in STEM experienced similar feelings of acceptance based on mainly external factors. There were few responses from both female-identifying individuals in STEM and female-identifying individuals not in STEM that expressed solely internal factors and a mix of both internal and external factors. Examples of external based factor responses include:

- “I know it was based on grades. I was an overachiever in high school.”
- “I feel as though my acceptance into Mac was based on my high secondary school GPA but I could not have gotten such a high GPA if it wasn't for online school (due to COVID lockdown) and the easy marks that come with unsupervised tests.”

Likewise, examples of external based factor responses include:

- “My hard work and dedication in grade 12.”
- “My work ethic in high school…”

These responses elicit the idea that McMaster University’s undergraduate students feel as though they have earned their spot in their programs through external factors alone. This introduces the idea that students may feel high rates of imposter syndrome, however, this is not specific to only female-identifying individuals in STEM as other groups studied have exhibited similar results.

Academic Validation

The last question participants were asked to respond to was based on discovering what makes students at McMaster University feel validated in their academics. The question read: In the space provided below, please explain what makes you feel most validated as a student. The responses varied among answers and were categorized into four groups. These groups were grades, positive feedback and recognition, understanding of academic content, and comparison to peers. These four groups were then categorized further into two categories: internal factors and external factors. Out of 44 participants, there were only 40 submitted responses to this question.

The responses to this question show that the majority of female-identifying individuals in STEM validate their academic achievement through external factors. Alongside female-identifying individuals in STEM, many other groups looked at experienced very similar results. In total, there were very few responses which claimed feelings of solely internal factors or a mix of both internal and external. Responses which were deemed to be considered external factors included those which displayed validation through grades, positive feedback, and comparisons to others. Answers included in our analysis of external factors include:

- “I feel most validated when people tell me I'm doing well. Grades are good but having someone give a nice comment or let me know they enjoyed having me in class is much more satisfying.”
- “As a student, receiving a good grade is a validating feeling. Even more so, positive feedback from professors and teaching assistants is very validating, as well as winning awards and scholarships.”

Responses to this question which were considered to be validated through a combination of both internal factors and external factors include:

- “What makes me feel most validated as a student is getting good grades depending on the class average. So, if the class average is low and I get a grade the same as the average I wouldn't feel as bad compared to getting an under-average grade. In a way, I feel validated if my level of intelligence is the same or higher than everyone around me.”

Through examining the ways in which students feel validated in their academic success, we can assume that female-identifying individuals experience high rates of imposter syndrome as they seek external sources for academic validation, which remain out of their control.

Discussion

Literary Findings

Concepts surrounding the literature on the persistence of imposter syndrome and the behaviours associated with these cognitive distortions were evident in the results of our study. This includes affective and doxastic features (Gadsby, 2022), as well as the cycles of worrying (Clance & Imes, 1978). These concepts are applicable to the entirety of our study, within all faculties and genders, as the majority of undergraduate students at McMaster University experience imposter syndrome. In regard to the literature surrounding imposter syndrome for female-identifying individuals within STEM programs, only one participant's answers resembled the literature. This student's answers can be evaluated through the prove-it-again bias (Crawford, 2021), a phenomenon commonly experienced by female-identifying individuals in STEM programs. The connections to the literature assist in evaluating the phenomenon of imposter syndrome for students. However, our survey did not provide results that can be related to other sections within the literature review, such as the origins of imposter syndrome, undergraduate STEM programs, as well as the stigmatization of female-identifying individuals in STEM programs.

In regard to affective features of imposter syndrome, about one-third of participants answered that they strongly agree to avoid tasks and assignments out of fear of failure. This can be inferred as a fear of exposure as an imposter through failing to maintain their level of success. Reviewing doxastic features, almost 40% of participants stated they agree that their accomplishments are a result of external factors. This reflects cognitive processes in which the student feels they are inadequate and lack abilities leading to success. When these features are combined, individuals experiencing imposter syndrome develop a biased perception in which they focus on supporting evidence of their beliefs, while avoiding contradicting evidence. This is evident in the question evaluating a tendency to recall failures more than past successes, as 36% answered sometimes, 36% answered often, and 25% answered always.

The literature states imposters continue to maintain these cognitive distortions through a cycle of worrying. This is evident within the results of our survey throughout 3 questions. The first question evaluates the idea that the student could work harder, regardless of work ethic and past successes, in which approximately two-thirds of participants answered they strongly agree. The second question investigates a lack of satisfaction with accomplishments and feelings as if they could have performed better, in which 43% agreed, and 25% strongly agreed. The third question pertains to worrying about maintaining the level of success after an accomplishment, in which 50% stated often, and 25% answered always. These results indicate a cycle of diligence associated with imposter syndrome, in which the student is motivated to work hard through fear of exposure as an imposter. In this, the student worries about intelligence, works hard, and attempts cover-up strategies, all of which reinforce temporary feelings of approval. These connections to the literature describe the ways in which individuals experiencing imposter syndrome maintain their cognitive distortions.

In regard to the literature surrounding female-identifying individuals in STEM programs, only one of our survey participants resembled the concepts within the literature. The singular female-identifying individual STEM participant resembled a prove-it-again bias. In their response to how they feel after receiving a good grade on an assignment, the student answered they feel positive emotions for a short period of time, but soon begin to worry about upkeep their level of success. As such, this is related to the prove-it-again bias, a common trend in which female-identifying individuals in male-dominated spaces feel the need to prove their competence multiple times throughout their career. However, these distortions representing the imposter phenomenon within the literature are only applicable to one female-identifying STEM participant within our study, out of the fourteen female-identifying individuals in STEM who participated in our survey.

Research Findings

Based on our qualitative and quantitative data, we can conclude that female-identifying individuals in STEM programs at McMaster University experience high rates of imposter syndrome. However, it was discovered that all faculties at McMaster University experience a similar, high rate of imposter syndrome. The discovery made within our research has allowed us to understand the reasons why students may feel these rates of imposter syndrome, which we have determined to be external factors and negative emotions.

When analyzing our qualitative data, it is evident the majority of students within McMaster University's undergraduate programs are confident in their academic abilities when they experience validation through external factors such as their grades or recognition from their professors. The lack of internal confidence leads these students to experience the imposter phenomenon as they refuse to acknowledge their own hard work and motivation, which plays a significant role in academics.

Looking deeper into the specific questions asked in this section, we observe that students exhibit high rates of imposter syndrome in two of the three questions. External factors, specifically grades, were among the highest recorded responses leading us to infer that these students feel high rates of imposter syndrome as they attribute their success to elements outside their inherent abilities. These results show these students feel as though their position at McMaster University was not earned through effort and intelligence, but that their acceptance was based on luck. While this is usually not the case, these feelings can leave students feeling like they have to overwork themselves in order to compete with their peers. Using this understanding of imposter syndrome and our survey results, it is evident that the majority of McMaster University students experience imposter syndrome, regardless of program, or gender.

The quantitative data provides us with a much clearer understanding as the results of these questions suggested that the rate of imposter syndrome among all McMaster University programs is significant across all groups studied. As seen in Figure 20a, each McMaster University program feels a high rate of imposter syndrome which was concluded using many close-ended questions.

We used a multifaceted view for this research by evaluating gender and faculty as a way to observe the interconnections of various categories and how this may relate to imposter syndrome. Lastly, further research must be conducted to fully develop an analysis of the rates of imposter syndrome among female-identifying individuals in male-dominated fields, such as STEM.

Conclusion

Limitations

Our limitations include several factors including sample size, generalizability, lack of diversity, and misrepresentations of the collected data. Through varying methods of recruitment, our team of researchers managed to recruit 44 participants, with the majority being female-identifying individuals and only 7 participants being non-female-identifying. This further limited our sample representation as we only looked at McMaster undergraduate students. Therefore, our low number of non-female-identifying participants provided additional difficulty to explore gender differences in imposter phenomenon.

However, the main limitation of our research included a lack of generalizability and diversity of population. A crucial part of our research was to examine the influence of the participants' diverse backgrounds on their experiences with imposter syndrome and if gender identity influences their chances of experiencing the imposter phenomenon. As our sample population was strictly composed of McMaster University undergraduate students (n=44), it presented a challenging limitation for providing a diverse and representative sample group.

Furthermore, our research required the comparison of female-identifying persons (81.8% of our sample population) and non-female-identifying persons (15.9% of our sample population) from varying academic, ethnic, and cultural backgrounds, which required enough participants to be recruited. Evidently, our sample population lacked enough participation from non-female individuals which skewed our results in properly identifying the significance between rates of imposter syndrome and gender identity. During our data analysis phase, we interpreted our results and saw little to no significance in the relationship between rates of imposter syndrome and gender identity as our sample group was not representative enough. In the future, a larger population and increased participation from non-female-identifying individuals are required to effectively observe a correlation between rates of imposter syndrome and gender identity.

Another limitation we discovered during our research is the possible misrepresentation of qualitative data. This research seeks to identify the prevalence of the imposter phenomenon among female-identifying undergraduate students at McMaster University. As such, this study does not intend, nor qualify, to diagnose or label participants as an individual with imposter syndrome. Understanding the lived experiences of participants from varying backgrounds and reflecting them accurately through data collection and analysis presented the risk of possible misrepresentation of qualitative data. During the data analysis phase, specifically during the interpretation of the qualitative results, our team coded keywords associated with positive feelings and negative feelings in order to measure rates of imposter syndrome.

As qualitative research is interpretive, it was more likely for misrepresentation to occur when reviewing lived experiences of imposter syndrome. The conciseness of our survey may have encouraged participants to feel as if their views, opinions, and lived experiences may be misrepresented and/or taken out of context. Due to qualitative questions' susceptibility to misinterpretation, each researcher within our team analyzed the data to assess interobserver agreements. This was to confirm solidarity among the researchers during the analysis of the answers to avoid misinterpretation. In addition to the possibility of misinterpreting qualitative results based on subjectivity, participants could have also been under-reporting feelings of imposter syndrome due to numerous reasons such as feelings of embarrassment and/or fear of exposure.

Future Directions

Though our hypothesis was not correct, our research still showed significant findings in regard to the topic of imposter syndrome. From a theory that originated from female-identifying individuals experiencing significant levels of imposter syndrome, our research shows progress in how the phenomenon is no longer isolated to certain groups (i.e., women) and is now something that everyone experiences regardless of their gender and/or field of study. Our research showed no significance for higher rates of imposter syndrome among female-identifying individuals and those in STEM, and that the phenomenon was consistently high across faculty and gender. The aim of this study was for the results to spotlight the effects a male-dominated field has on younger female-identifying individuals entering into adulthood. Our findings should serve as a starting point for future researchers to further explore this topic.

From our own research, future researchers should first take into account the importance of sample sizes. Our small sample size made it more difficult to find trends, relationships, and measuring significance in syndrome rates, especially since the majority of our participants were female-identifying. Future research might also consider extending this topic to other Ontario universities to examine if the choice of academic institution and social hierarchy plays a role in undergraduate students experiencing imposter syndrome. For example, comparing academic institutions that are known to be “STEM forward” to those that are not and seeing if there is a relationship that exists between students experiencing higher rates of imposter syndrome due to their school’s prestige and reputation.

As our research focused on comparing female-identifying individuals in STEM programs to which there was no established significance, future researchers can broaden their scope by looking at individual programs across faculties and programs as our data concludes that imposter syndrome is not isolated to one, but rather experienced by all regardless of academic background. From our results, the non-STEM Faculty of Humanities was the second highest faculty to experience higher rates of imposter syndrome. It may be interesting to explore individual programs within other faculties to see if higher rates of imposter syndrome are occurring within the faculty and across different specializations.

Lastly, future researchers can also look at the relationship between the prevalence of imposter syndrome and the status one holds in the academic hierarchy. Exploring the varying levels of academia, such as undergraduate and postgraduate endeavours, and comparing them with one another may highlight the prevalence of imposter syndrome and reasons as to why individuals may experience the phenomenon when continuing with higher education. It would also be interesting to look at any cultural differences regarding imposter syndrome across societies beyond the Western world. If future researchers sought to expand their scope, they can explore the way individualistic versus collective societies influence female-identifying individuals in STEM and their rates of imposter syndrome, and whether there are any significant differences in their experiences in academia.

Summary and Concluding Thoughts

As a final takeaway for our research, our original hypothesis was not correct as we found no correlation between higher rates of imposter syndrome and female-identifying individuals as well as those in STEM programs. What our results did show is that imposter syndrome is prevalent among students, however, the rates were essentially equal across faculty and gender. This leads to an interesting discussion on how society treats people in academia in general and this may lead to further research on how we can change this mindset and reduce feelings of inadequacy. More research needs to be conducted on this topic with a larger sample size to confirm our results. Though our original hypothesis was incorrect, our research still contributed significant insights on this topic, posed further questions, and can serve as a stepping stone for future researchers to consider when exploring the topic.

Acknowledgements

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The Association Between Birth Order & Attachment Style

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Abstract

This study explores the potential influence of birth order on individuals' attachment styles, situated within the framework of attachment theory. The research investigates the correlation between attachment styles and sibling birth order, focusing on attachment orientations that develop during childhood. Attachment is defined as an individual's relationship orientation and response to relationship aspects, categorized as secure, avoidant, anxious-ambivalent, and disorganized-disoriented (Ainsworth et al., 1978; Bowlby, 1959; Miller, 2022). Sibling birth order is considered in relation to an individual's birth position (e.g., first-born, second-born, etc.). The paper comprises sections such as a literature review, outlining previous research, a theoretical foundation discussing attachment theory and its styles, and a research methodology detailing the research question, data analysis, and project management plan. The study aims to provide insights into the connection between birth order and attachment styles, contributing to the understanding of attachment theory's applicability in Western contexts.

The Association Between Birth Order & Attachment Style

The topic of study for this paper is how birth order can influence an individual’s attachment style. Our research aims to uncover a potential correlation between these two variables. Attachment theory is quite prevalent in the realm of social psychology, and we hope to provide more research that can be applicable to the use of this framework within a Western context.

Variable Definitions

To develop our research and understand current literature, it is important to define the two main variables: attachment and sibling birth order. Attachment refers to the style of attachment an individual has in regard to others, which is typically developed during childhood, but not always stable (Miller, 2022). It describes relationship orientation and how an individual responds to aspects of their relationships, such as intimacy or proximity (Miller, 2022). Individuals can be categorized into one of four styles, which will be further described in the theory section: secure, avoidant, anxious-ambivalent, and disorganized-disoriented (Bowlby, 1959; Ainsworth et al., 1978). For the purposes of this research, we considered attachment development in childhood to determine the influence of caregiver treatment and how this differs between siblings. This introduces the second variable, sibling birth order. This refers to the order of an individual’s birth (e.g., first-born, second-

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born, etc.). For the purposes of this research, we also examined the number of siblings an individual has (e.g., single child, one sibling, twin set, etc.) in relation to birth order.

Paper Outline

The following paper is divided into various sections to best describe what our research will entail. Firstly, there is a literature review that analyzes previous research conducted on birth order and attachment theory, as well as other topics such as caregiver behaviour and sensitivity, and outcomes of certain attachment styles. This section situates the context of our research and provides an understanding of the limitations of past research. To continue, we describe the guiding theory of our research, outlining John Bowlby and Mary Ainsworth's contributions to attachment theory, providing an overview of the different attachment styles (Bowlby, 1958; 1959; Ainsworth et al., 1978).

Additionally, in the research methods section, we outline our research question, which is: how does one's birth order affect their attachment style? This section communicates our research process, as well as any ethical issues or other challenges that arose during our research. It also outlines our data analysis process, followed by our project management plan, including the division of tasks amongst group members. The results section will include the participant demographics and statistical results about attachment, and the discussion section will interpret these results. Finally, we will conclude by providing an overall summary of our research, and an outline of the limitations and significant insights within our research.

Theoretical Basis

It is important to recognize the basis for attachment theory and the main attachment styles to understand how they are related to sibling birth order. This section references the key theorists' John Bowlby and Mary Ainsworth and their framework of the main attachment styles: secure, avoidant, and anxious-ambivalent (Bowlby, 1958; 1959; Ainsworth et al., 1978). A newer category of attachment proposed by Mary Main and Judith Solomon, disorganized-disoriented, is also examined (Main & Solomon, 1990).

Key Theoreticians: John Bowlby & Mary Ainsworth

The most complete explanation of attachment is John Bowlby and Mary Ainsworth's ethological theory. The first important feature of this theory is the emphasis that is placed on the active role played by the infant's early social signalling system (Bowlby, 1958). Examples of signalling behaviours in infants' attachment are smiling, crying, sucking, vocalizing, and clinging. These signalling behaviours elicit the care and protection that the baby needs from their caregiver as well as promote contact between infant and caregiver (Bowlby, 1958).

The second notable aspect of ethological theory is the stress on the development of mutual attachments. There are evolutionary biases at play that make it likely that the child will use the caregiver as a secure base or as an attachment figure. This means that the caregiver is a safe zone for the infant to retreat to for comfort and reassurance when stressed or frightened while they are exploring their environment (Bowlby, 1958).

There are three conditions that must be met in order to be an attachment figure (Bowlby, 1958). The first is that they must be someone that the individual seeks in times of need or stress and that loss or separation from them causes distress. The second condition is that the person is a potential safe haven; they can provide hope or comfort when needed. The final condition is that the individual must be a secure base, which means that they allow the person to explore and take risks without being excessively worried (Bowlby, 1958). When children are in a situation that triggers both attachment as well as escape behaviours, such as wanting to leave or avoiding facing the situation, Bowlby (1959) stated that they will experience separation anxiety if they do not have an attachment figure to go to.

Building off of this, the third key principle of ethological theory emphasizes that attachment is a dyadic relationship; it is not simply a behaviour of either the child or the caregiver (Bowlby, 1958; 1959). Bowlby (1959) argued that pseudo-affection from maternal figures could be a result of them overcompensating for (un)conscious hostility. He claimed that excessive separation anxiety is a result of negative familial experiences such as being repeatedly rejected or threatened. Moreover, he then stated that while this may be the case in particular situations, separation anxiety can be excessively low or even absent in other cases, which gives the false impression of maturity. This pseudo-independence is a defensive process (Bowlby, 1959). In contrast, an appropriately nurtured child will not actively want to be separated from their caregiver(s) but will, in time, develop self-reliance (Bowlby, 1959). These ideas helped form Ainsworth's attachment style types: ambivalent, avoidant, and secure (Bowlby, 1959; Ainsworth et al., 1978).

Categories of Attachment Styles

There are four categories of widely accepted attachment styles: (1) secure, (2) insecure - avoidant, (3) insecure anxious - ambivalent, and (4) disorganized - disoriented (Ainsworth et al., 1978; Bowlby et al., 1956).

Secure Attachment. The infant is confident about the caregiver's availability, responsiveness, and reliability. The caregiver simultaneously serves as a secure base of exploration and a safe haven when they are distressed. Both the exploration away from the caregiver and the type of contact after they return are important considerations (Ainsworth et al., 1978; Bowlby et al., 1956).

Insecure-Avoidant Attachment. The infant is not confident in their caregiver's availability, responsiveness, and reliability due to the caregiver often ignoring the distressed child. They are less likely to see their caregiver as a secure base (Ainsworth et al., 1978; Bowlby et al., 1956).

Insecure-Anxious-Ambivalent Attachment. This attachment style is a result of the caregiver ignoring or negatively reacting when the infant is distressed at times but responding with comfort in other scenarios. As a result, the child's behaviour is as inconsistent as their caregiver's (Ainsworth et al., 1978; Bowlby et al., 1956).

Disorganized-Disoriented Attachment. The infant avoids interactions with most people, including caregivers, as their parental figure neglected them. Caregiver presence or absence does not impact the infant's behaviour (Main & Solomon, 1990).

Theory Conclusions

In summary, to help understand the theoretical basis of attachment styles, looking at the main theorists who contributed to this field was vital. Two key theorists, John Bowlby and Mary Ainsworth, conceptualized the main attachment styles of secure, anxious-ambivalent and insecure-avoidant (Bowlby, 1958; 1959; Ainsworth et al., 1978). Additionally, Mary Main and Judith Solomon extended the work of Bowlby and Ainsworth by proposing a new category of attachment style known as disorganized-disoriented

(Main & Solomon, 1990). These four attachment style categories were utilized to construct our study.

These theories were relevant to our research as they provided the background information required to compare our collected data with existing information, in order to conduct a deeper analysis of the results. For example, data showed that female-identified participants had a higher likelihood of anxious and avoidant attachment style. Drawing upon the theoretical knowledge gathered, we know that this implies they are more likely to view others as unreliable, unavailable, and inconsistent (Ainsworth et al., 1978; Bowlby et al., 1956).

Literature Review

The following section of the paper examines significant research regarding attachment styles and birth order from the past two decades. There are six subcategories of research, including: (a) stability of attachment over time, (b) differences in caregiver behaviour over time, (c) caregiver sensitivity, (d) social success, (e) employment, and (f) romantic relationships. Finally, there is a section dedicated to the limitations of such research, which focuses mainly on the lack of research supporting the continuity of attachment over time and the mixed results about the factors that influence attachment style development.

Stability of Attachment Styles Over Time

The stability of attachment has been observed over time. Attachment classifications at age one predicted 90% of secure attachments and 75% of insecure classifications at age six (Iwaniec & Sneddon, 2001). 72% of the children classified as secure in infancy were secure 20 years later (Iwaniec & Sneddon, 2001). These findings are highly correlated with secure attachment, and less correlated with insecure attachment styles (Iwaniec & Sneddon, 2001). However, there is evidence from both higher-risk and normative-risk samples that infant attachment on its own is only weakly associated with attachment in early adulthood. Quality of early caregiving is a relatively robust predictor of security in adulthood, as expected by attachment theory. The quality of attachment is relatively stable across time but can change if the environment improves or deteriorates. Change can go either way, but it is more common for insecure children to become secure (Hallers-Haalboom et al., 2017; Iwaniec & Sneddon, 2001).

Differences in Caregiver Behaviour Over Time in Relation to Birth Order

Lehmann et al., (2016) examined how the presence of siblings can affect the behaviour of parental figures and the treatment of the children. It has been found that parents spend less quality time with later-born children at any age and are less strict with grades. As a result, there are strong effects on cognitive ability when comparing first-born children with later-born children (Lehmann et al., 2016). This is for a few different reasons. One is that parents are unable to provide the same level of cognitive support or stimulation for later-born children in the same way that they did for their first-borns (Lehmann et al., 2016). Additionally, parents tend to revise their parenting methods as times change and new ideas and research are discovered. Finally, parents are more likely to be at ease with their younger children as they have gained more confidence in their own parenting style and experience from their first-born (Lehmann et al., 2016; Isgor, 2017). Thus, there is a negative correlation between higher birth order (e.g., second- or third-born) and IQ, educational attainment, and wages (Lehmann et al., 2016).

Furthermore, İsgor's (2017) study showed how university-aged students' secure attachment style and compassion scores are influenced by the participant's birth order and perceived parental attitudes. On average, when compared to single children and siblings, middle children had higher levels of secure attachment. Even more, middle children were also higher in compassion when compared to single children. In contrast, secure attachment styles and compassion scores were lower in participants whose parents had an authoritative parenting style (İsgor, 2017). Mediated by birth order, these cognitive differences and changes in parental behaviour can possibly affect a child's attachment style.

Finally, a longitudinal study on parental treatment, which used participants aged 12 to 14, explored the parent-child relationship through the lens of the child's perceptions of fairness and differential parental treatment. They also looked at parental empathy, and the child's psychosocial well-being, level of trust, as well as their personality (Ng et al., 2020). This study considers many different aspects that can affect attachment along with birth order, providing a well needed holistic approach to the study of attachment styles and birth order.

Parental Sensitivity

Hallers-Haalboom et al., (2017) explored sensitivity in parenting styles which is defined as "appropriate adjustment to the needs and responses of children" (p. 860). Their study employed a longitudinal design in three waves in order to fully appreciate the "differences in parental sensitivity for first-born and second-born children" (p. 867) in the Netherlands (Hallers-Haalboom et al., 2017). Single parent families were excluded, and emotional availability scales (EAS) were used to measure parents' sensitivity during the children's playtime. They found that sensitivity toward the first-born decreased over time, however, sensitivity toward the second-born increased from the first to second wave and continued to remain stable until the third wave (Hallers-Haalboom et al., 2017). This may be because the older children attended school in later waves (Hallers-Haalboom et al., 2017; Kennedy et al., 2014).

However, when both children were compared at three years old, the parental sensitivity level was the same, so it is possible to infer that sensitivity plateaus eventually (Hallers-Haalboom et al., 2017). Since there is no correlation between the decreased sensitivity toward first-borns and the increased sensitivity to second-borns (when compared at the same age), Hallers-Haalboom et al., (2017) concluded that birth order likely does not influence the level of parental sensitivity, but rather the development of each child.

Aligning with these results, another study on toddler-aged sibling pairs showed that birth order is not associated with the quality of parental attachment even though mothers presented more positive emotions when interacting with later-born children and higher maternal sensitivity with older siblings (Kennedy et al., 2014). Finally, the sensitivity of both parents tend to influence each other, especially in regard to the older sibling(s) (Hallers-Haalboom et al., 2017; Kennedy et al., 2014). Despite the insignificant correlation between birth order and parental sensitivity, these studies reflect the complexity of developing parental techniques and attachment styles.

Social Success

As mentioned earlier, there is a negative correlation between higher birth order and IQ, educational attainment, and wages (Lehmann et al., 2016). However, birth order and attachment style do influence the success of all types of relationships. Abol Maali et al., (2014) found that individuals with avoidant and anxious attachment styles have "significantly negative relationships with functional social problem solving" (p. 17). As expected, these same individuals have significantly positive relationships with dysfunctional social problem solving.

Abol Maali et al., (2014) claimed that birth order significantly predicts dysfunctional social problem-solving in university-aged students. According to their research, older siblings are more likely to use dysfunctional social problem solving. On the other hand, younger siblings reported higher levels of avoidant attachment styles. They also found that children who have insecure attachment styles are more likely to have weak communication skills (Abol Maali et al., 2014). Problem-solving and communication are extremely important skills to have in order to maintain a healthy, positive relationship.

In addition, Alhusen et al., (2013) found that the avoidant attachment style is positively correlated with decreased levels of maternal-fetal attachment (MFA) throughout pregnancy. MFA can track the significance of a mother's connection with her child while she is pregnant and how this connection will continue to develop after birth (Alhusen et al., 2013). Mothers with avoidant attachment styles are more likely to be resistant to forming bonds with their children which, in turn, causes them to have trouble bonding with not only their mother, but also other individuals in their lives. For example, if she has depressive symptoms throughout the pregnancy, then MFA levels will be lower as depression decreases mothers' confidence in their ability to care for and nurture their child(ren). Therefore, it is not surprising to discover that anxious-ambivalent attachment styles are positively correlated with postpartum depression (Alhusen et al., 2013).

Iwaniec & Sneddon's (2001) longitudinal study on attachment styles throughout the life course found that relationships and attachment become more healthy and secure over time for a variety of reasons. The second measurement of attachment style took place 20 years after the first measure when the participants were between ages one and eight. When support for families with a low socio-economic status is provided, it is found that their children usually display age-appropriate development and that their relationships and attachments become stronger (Iwaniec & Sneddon, 2001).

In addition, it was found that when individuals become parents, they develop a new understanding and appreciation for their own parents, helping their attachment to become more secure. Iwaniec & Sneddon (2001) also discovered that it is possible for children who had been abused to change their attachment from anxious to secure if positive changes are made to their environment. This research shows that attachment styles are not static; they can change over time, especially when helpful resources are provided for families (Iwaniec & Sneddon, 2001).

Employment

A study undertaken by Leenders et al., (2019) aimed to investigate the relationship between attachment avoidance, attachment anxiety, and various factors related to job searching, including job search intention, job search self-efficacy, job search self-esteem, and job search attitude. The sample comprised 180 employees from an international industrial organization in the Netherlands (Leenders et al., 2019). This study found a strong, positive correlation ($r = 0.38$, $p = 0.01$) between anxious and avoidant attachment, so the researchers had to control for one style when analyzing the other (Leenders et al., 2019).

The results indicated that attachment avoidance had a greater impact on the job search process than attachment anxiety, with more avoidantly attached individuals reporting, “lower job search intentions, lower job search self-efficacy, and more negative job search attitudes” (Leenders et al., 2019, p. 487). Attachment avoidance affected job search intentions “through job search self-efficacy and job search attitude but not through job search self-esteem” (Leenders et al., 2019, p. 487). On the other hand, attachment anxiety did not have any effect on “job search intention through job search self-efficacy, job search self-esteem, and job search attitude” (Leenders et al., 2019, p. 495). Overall, attachment style was found to be an important individual characteristic that can impact the job search process.

Romantic Relationships

McGuirk & Pettijohn II (2008) conducted a study in which 100 college students took an attitude towards love scale, attachment style questionnaire, and the multidimensional jealousy scale. The multidimensional scale revealed greater jealousy for middle siblings, followed by the youngest sibling group, only children, and older siblings. Notably, there was a significant gap in the levels of jealousy between the middle and older siblings. The attitudes towards love scale, on the other hand, showed that older siblings tend to be the most realistic, followed by the middle sibling, only child, and finally, the youngest sibling. These results suggest a stronger inclination for the younger siblings to be more romantic (McGuirk & Pettijohn II, 2008). The attachment style questionnaire revealed that middle siblings had the highest percentage of insecure attachment (57.14%), and only children had the highest percentage of secure attachment (66.66%) (McGuirk & Pettijohn II, 2008). The results are statistically significant; jealousy and attachment styles are related, therefore as sibling birth order plays a part in determining attachment styles, it later affects jealousy in romantic relationships which in turn affects the success of the relationship (McGuirk & Pettijohn II, 2008).

Furthermore, Robertson et al., (2014) studied birth order and its impacts on romantic relationship satisfaction and attachment style. They looked at sibling and romantic relationships among university students who had at least one sibling and were currently in a romantic relationship. Overall, younger siblings were perceived as being more favoured by parents. It was also found that younger siblings rated romantic relationships as more satisfying (Robertson et al., 2014). The older sibling group perceived themselves as having more status and power than their younger sibling while the younger siblings perceived themselves as having less power. However, the relationship between siblings did not correlate with relationship satisfaction.

Another factor that affects relationship satisfaction is the length of the relationship. For romantic relationships shorter than 24 months, there was no distinguishable difference between the satisfaction of older or younger siblings (Robertson et al., 2014). However, for romantic relationships that lasted longer than 24 months, younger siblings rated their relationships as more satisfying than the older siblings. Although statistically insignificant, the relationship with an older sibling who is perceived to have more power and authority may act as an additional parental attachment figure (Robertson et al., 2014). This may lead to a more secure attachment style for the younger sibling and thus a better relationship with their significant other (Robertson et al., 2014).

Limitations of Previous Research

Nature vs. Nurture

One limitation of the existing research on attachment styles is that there are mixed findings on the continuity of attachment over time (Pasco Fearon & Roisman, 2017; Hallers-Haalboom et al., 2017). Twin studies have additionally shown that there is little genetic influence on attachment while there is a large influence from the environment. Previous findings of genetic influence are not being replicated in current data and experiments (e.g., DRD4 gene, 5-HTT gene) or have had false positives due to measurement error and extraneous variables (Pasco Fearon & Roisman, 2017). However, genetic effects should still be investigated as twin studies have failed to fully identify the genetic effects on specific styles of attachment. Furthermore, caregiver sensitivity is still a weak predictor of attachment, and more research needs to be conducted in order to learn more about environmental determinants (Pasco Fearon & Roisman, 2017).

Age & Gender Demographics

Most studies focus more on young children, so more research on adolescents or young adults is needed, as the age of the participants might affect the results. Research into the association between attachment and the socio-emotional adjustment of children is also lacking. This is an important factor that needs to be studied more, as early attachment experiences can predict how children might respond to social situations in adolescence, and even as far as adulthood (Pasco Fearon & Roisman, 2017; Hallers-Haalboom et al., 2017).

Similarly, a limitation within the study done by Robertson et al., (2014) is regarding the fact that there were 154 female participants and only 35 male participants. This does not allow for the assessment of gender differences and the role they play in the development of attachment style. Furthermore, we found no studies examining attachment among non-binary or genderqueer participants, reflecting a major gap in gender studies regarding attachment. Clearly, a more diverse participant population is needed to determine the full extent of attachment differences and the influence of various forms of sibling dynamics.

Longitudinal and Cross-Sectional Studies

A final limitation of existing research is that there are quite a few longitudinal and cross-sectional studies on attachment style in general. However, there are not many studying the relationship between birth order and attachment. Within the scope of birth order and attachment research, participant populations mainly include caregivers, young children, or adults reflecting on their adolescence. Further longitudinal or cross-sectional research is necessary to gain a better understanding of how familial relationships and attachment styles change or remain stable over time.

Literature Review Conclusions

To summarize, the current available literature demonstrates that there are some inconsistencies when it comes to the effects of birth order and attachment styles. Some studies have shown that birth order does have effects on attachment style, while others have demonstrated the opposite. The current research also highlights how birth order can impact various aspects of development, such as education, job attainment, and caregiver relationships, indicating that birth order is of some salience throughout development. Moreover, much of the research is also focused on young children or young adolescents, leaving a gap in the research regarding older adolescents and young adults. Based on the existing literature, our objective is to address these inconsistencies by conducting research that includes older adolescents and young adults, while also providing a comprehensive understanding of the relationship between birth order and attachment style.

Methodology

To restate, our research question is: how does one's birth order affect their own attachment style? The following section will explain how the research was conducted in order to answer this question.

The research was approved by the McMaster Research Ethics Board (MREB#: 0327). The method of data collection we used was an anonymous, online, quantitative survey through the McMaster Research Ethics Board (MREB) approved platform LimeSurvey. The survey consisted of 18 questions, nine of which were on a seven-point Likert scale ranging from strongly disagree to strongly agree and included a "prefer not to answer" option. The next four questions were multiple choice or written answers pertaining to number of siblings, position of birth order amongst siblings, as well as birth years of siblings. Finally, the last five questions involved general demographic information pertaining to the participant's year of undergraduate study, gender, age, and race/ethnicity, which were inspired by McMaster University's (n.d. a) guide to demographics. Some of the questions involved in the survey may have been sensitive and participants were not required to answer every question if they did not feel comfortable doing so. Examples of questions participants were asked include rating on a scale of one to seven the extent to which the following statements apply to them: "I am uncomfortable opening up to people, I fear that other people will reject me, I frequently worry people do not genuinely care about me."

Researchers

The collection, analysis, and write-up of the results was conducted by six fourth-year students in the Social Psychology program as part of their thesis requirement. The research project was supervised by Dr. Sarah Clancy, professor of the SOCPSY 4ZZ6 A/B course.

Research Process

The research process first entailed gathering existing data on the topic of attachment styles which included the definition of attachment and its different styles. We also collected existing data on birth order and its effect on attachment style to further our knowledge of the research topic. Our group then crafted a survey to specifically determine the participants' attachment style, birth order, and demographics such as year of study, age, gender, and ethnicity.

In order to determine attachment style, we took inspiration from the freely available Experiences in Close Relationships Scale - Relationship Structures (ECR-RS) questionnaire (Fraley et al., 2011). As opposed to focusing on a specific type of close relationship (such as mother-child, father-child, friendship, or romantic), we chose to use the adapted ECR-RS aimed at global attachment to determine one's attachment style for close relationships in general. The survey involved six questions aimed at scoring attachment-related avoidance and three questions aimed at scoring attachment-related anxiety. Therefore, participants could score high in both avoidance and anxiety. If they scored low in both avoidant and anxious attachment, then it was assumed that they had a secure attachment style.

Recruitment

After we received ethics approval, we started student recruitment on November 11, 2022, and concluded on February 17, 2023. The sampling methods used were snowball and convenience sampling. The link to the letter of information and the survey were distributed through email and social media amongst the general McMaster undergraduate student body, as well as specific clubs, for anonymous completion. All of the participants were McMaster undergraduate students who are 18 years of age or older.

Data Analysis

After inputting all the results from the responses to our survey into an Excel spreadsheet, the data was uploaded into Jamovi. Using version 2.2 of the Jamovi software to conduct our statistical analysis, we calculated descriptive statistics (mean and standard deviation), frequency analysis, correlation matrix, linear regression, and the reliability of our measures using Cronbach's alpha. Moreover, the level for statistical significance was set at $p \leq 0.05$ when analyzing our data.

Data Privacy

During the research collecting and analyzing process, only members of the research team had access to the data. As an additional measure of security, the data was stored on password-protected computers and, where possible, password-protected files.

Ethical Issues: Survey Completion

Researcher Conflicts of Interest

There were minimal ethical concerns regarding researcher conflict of interest, as the researchers did not receive personal compensation for the research. Furthermore, the only link between the researchers and the participants was that they are all undergraduate students at McMaster University. Lastly, third party recruitment methods were used so there was no direct contact between the researchers and participants.

Social & Psychological Risks

There may have been potential social and psychological risks from participating in this research study. In terms of social consequences, participants may not have remained anonymous, depending on the location they filled out the survey and/or if they liked or forwarded social media posts in relation to our research. To combat this, participants were encouraged to complete the survey in their own time and space so they could be alone. The following statement was included in the recruitment script, "please do not like or forward this post if you wish to remain anonymous."

In terms of psychological risks, participants may have felt worried, embarrassed, or uncomfortable during or after participating in the survey. To mitigate these potential consequences, students could have skipped any questions they did not wish to answer (except for the consent question) and could close the survey at any point before submission. Participants did not face any consequences for failing to complete any or all the survey questions. In addition, the survey was anonymous, so any potentially identifying information cannot be traced back to them. Finally, the survey included below minimal risk questions. Nonetheless, prior to and after taking the survey, wellness resources were made available to the participants as a precautionary measure, acknowledging that everyone's experiences may differ. Overall, the research posed no greater risk to participants than those faced in daily life.

Summary of Methodology

As previously mentioned, the research was conducted by six undergraduate students at McMaster University. The sampling methods used for this study were snowball and convenience sampling. The survey was anonymous and distributed digitally to the McMaster student body and various McMaster Student Union (MSU) clubs through email and social media platforms. Participants had from November 10th, 2022, to February 17th, 2023, to respond.

In total, the research process included gathering existing information on the topic of attachment styles, birth order, and their potential relationship. We then created a survey on the MREB approved platform, LimeSurvey, with questions that pertained to our chosen topic of attachment style and birth order. To determine attachment style, we utilized the Experiences in Close Relationships Scale - Relationship Structures (ECR-RS) questionnaire on global attachment as a starting point for the construction of our survey (Fraley et al., 2011). As for data privacy, only the research team had access to the survey responses, and it was password-protected to ensure the privacy of participants. Finally, the data was analyzed using version 2.2 of the Jamovi statistical software program.

Overall, there are minimal ethical concerns with this study. The only link between the researchers and participants is that they are all undergraduate students at McMaster University. While the survey was entirely anonymous, participants were also encouraged to complete the study alone in order to ensure that their identities were kept private. Additionally, participants could skip any questions they did not wish to answer, aside from the consent question, and were given wellness resources at multiple points throughout the survey.

Results

Population Demographics

The respondents to our survey included 100 McMaster undergraduate students between the ages of 18 to 22 years old, with 43% of participants being 21 years old. The majority of respondents identified as female (76%), with 17% identifying as male and 6% identifying as non-binary. Six faculties were repeated across all 100 respondents: Social Science (29%), Science (29%), Engineering (18%), Health Science (10%), Business (7%), and Humanities (5%). There was also some variability among the ethnic make-up of respondents. Answers for the self-identified ethnicities of respondents were sorted into the following broad categories: 49% White, 22% South Asian, 11% multiethnic, 9% East Asian, 3% South-East Asian, 2% Middle Eastern, 1% Eastern European, 1% Hispanic/Latino, and 1% African. For our purposes, the multiethnic category included any response that indicated two or more of the previous broader ethnic categories.

Attachment Style Statistics

Avoidant attachment was assessed in questions one through six, with questions one to four reverse scored. The mean score (out of seven) for attachment-related avoidance among our 100 participants was 3.57, with a standard deviation of 1.16, a minimum of 1.50, and a maximum of 6.00. Anxious attachment was assessed among respondents by averaging the scores of their responses for questions seven through nine. The mean score (out of seven) for attachment-related anxiety among our 100 participants was 4.85, with a standard deviation of 1.72, a minimum of 1.00, and a maximum of 7.00. Using Cronbach's alpha, the reliability analysis revealed that our attachment questionnaire had good internal consistency (α = 0.795). Please see Table 1 below for a summary of these results.

Table 1
Average Attachment-Related Avoidance & Anxiety Descriptives

	Average Avoidance	Average Anxiety
N	100	100
Missing	0	0
Mean	3.57	4.85
Median	3.67	5.33
Standard Deviation	1.16	1.72
Minimum	1.50	1.00
Maximum	6.00	7.00

Birth Order

The correlation between average avoidance, average anxiety, and birth order was also determined. Through a correlation matrix (Table 2), it was found that there is a very weak negative correlation between birth order and attachment-related avoidance (r = -0.094), but it was insignificant (*p* = 0.351). It was also determined that there is a weak negative correlation between birth order and attachment-related anxiety (r = -0.015) but, again, it was insignificant (*p* = 0.883). Surprisingly, there was a weak positive correlation between anxious and avoidant attachments (r = 0.224) with significant results (*p* = 0.025).

The data depicts little to no correlation between birth order and avoidant or anxious attachment, with the *p*-values suggesting insignificant results. There is a weak, positive correlation (0.224, *p* = 0.025) between anxious and avoidant attachment, suggesting that those with dimensions of an anxious attachment are more likely to also have dimensions of an avoidant attachment, and vice versa. This correlation is significant.

Gender Differences

Through linear regressions, it was also illustrated that there is a gender difference. For the correlation between birth order and attachment-related avoidance, it was found that

Table 2

Correlation Matrix Between Attachment-Related Avoidance, Average Anxiety, and Birth Order

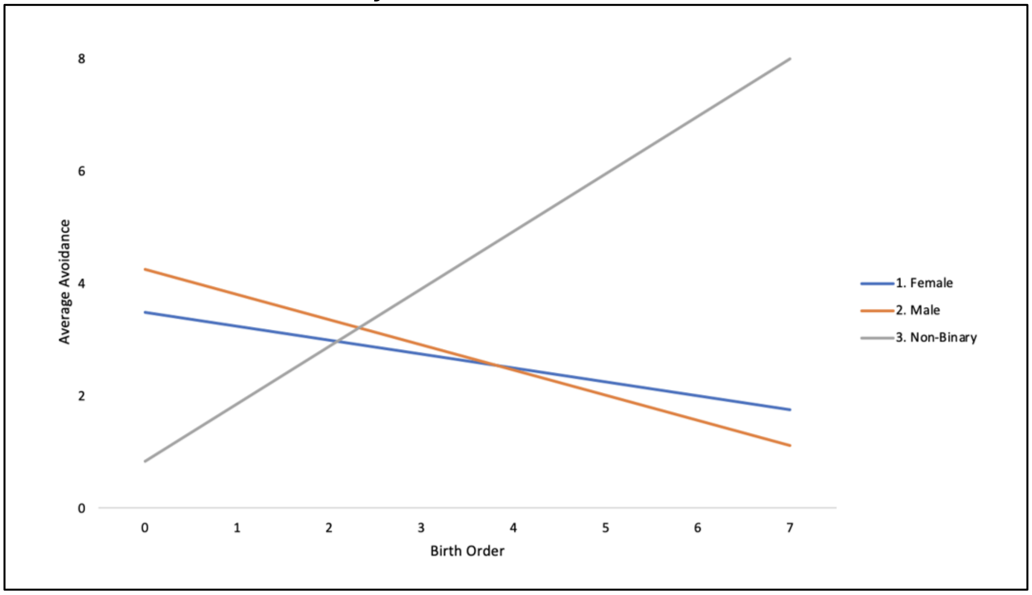
		Average Avoidance	Average Anxiety	Birth Order
Average Avoidance	Pearson's r	–		
	p-value	–		
Average Anxiety	Pearson's r	0.224*	–	
	p-value	0.025	–	
Birth Order	Pearson's r	-0.094	-0.015	–
	p-value	0.351	0.883	–

Note. * *p* < .05, ** *p* < .01, *** *p* < .001

both males and females had a negative correlation, while non-binary participants showed a positive correlation. Although, the correlation between the variables is very weak (r = 0.293). See Figure 1 below for the graphical display of this finding. The *p*-value for the correlation between attachment-related avoidance and birth order, as mediated by gender, was *p* = 0.886, and therefore, was insignificant.

Figure 1

Birth Order x Avoidance: by Gender

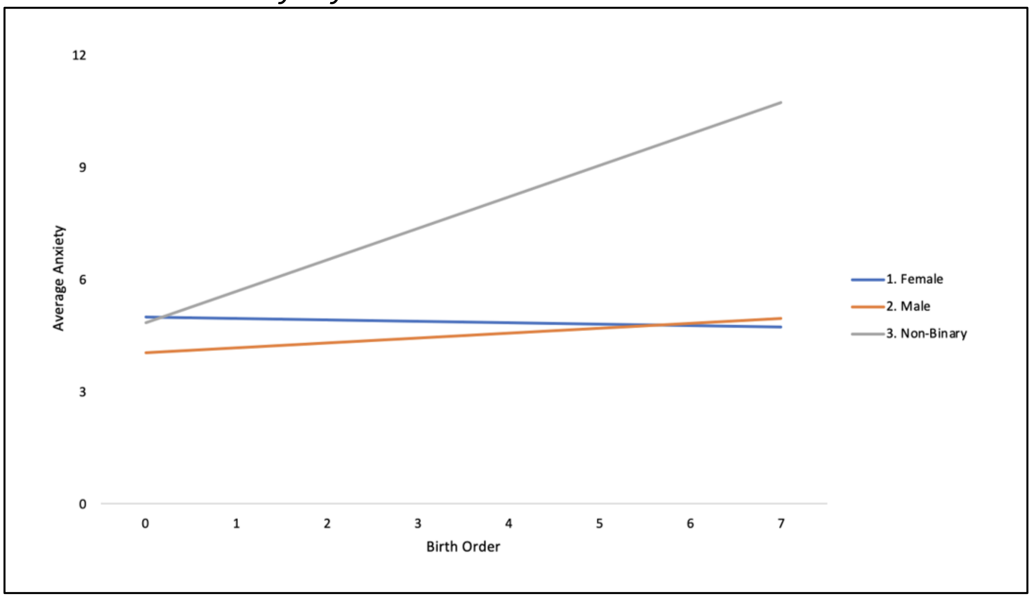


The linear regression illustrates the relationship between the average means of attachment-related avoidance and birth order, separated by gender variables. Male and female identifying participants had a negative correlation with attachment-related avoidance, meaning younger siblings scored lower on avoidant attachment than older siblings. Non-binary identifying participants had the opposite trend, meaning younger siblings scored higher on avoidant attachment than older siblings.

For the correlation between birth order and attachment-related anxiety, it was found that only females showed a negative correlation while both male and non-binary participants showed a positive correlation. Although, the correlation between these variables is very weak (r = 0.262). See Figure 2 below for the graphical display of this finding. The *p*-value for the correlation between attachment-related anxiety and birth order, as mediated by gender, was *p* = 0.835, and therefore, was also insignificant.

Figure 2

Birth Order x Anxiety: by Gender



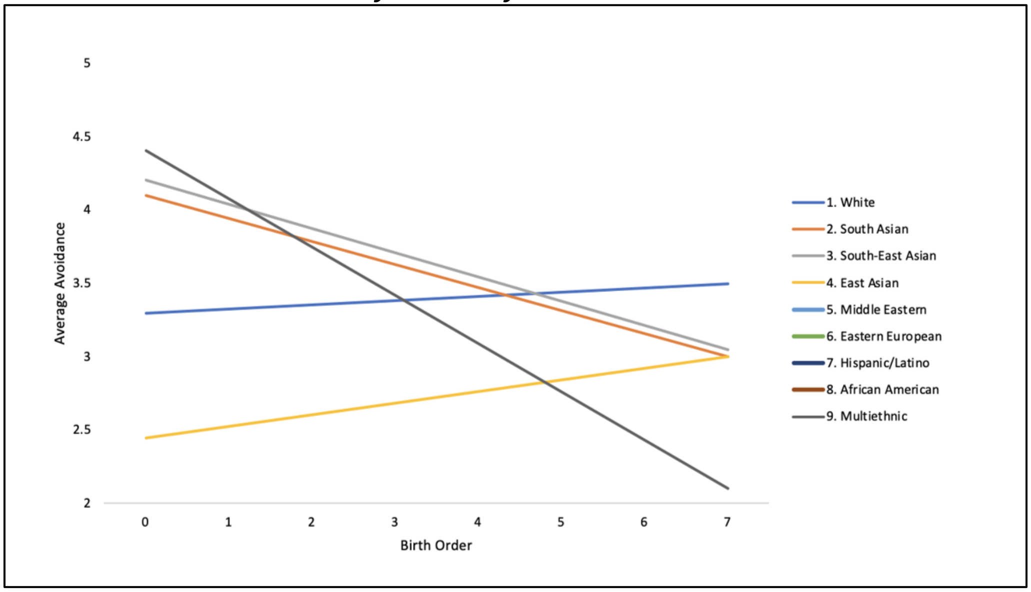
The linear regression illustrates the relationship between the average, centred means of attachment-related anxiety and birth order, separated by gender variables. Male and non-binary identifying participants displayed a positive correlation with anxious attachment, meaning younger siblings scored higher on attachment-related anxiety than older siblings. However, non-binary participants displayed a much stronger positive correlation between attachment-related anxiety and birth order than their male counterparts. Female identifying participants displayed a negative correlation, meaning that younger siblings scored lower on attachment-related anxiety than older siblings.

Ethnicity Differences

Through linear regressions, it was illustrated that there are some differences based on ethnicity. See Figure 3 below for the graphical display of this finding. The correlation coefficient for these variables was r = 0.402, making the correlation weak. Multi-ethnic participants depicted the strongest negative correlation between an avoidant attachment style and birth order, while those who identified as White or South-East Asian represented a positive correlation between avoidant attachment style and birth order. The *p*-value for these results is *p* = < 0.001, and therefore were significant.

Figure 3

Birth Order x Avoidance: by Ethnicity



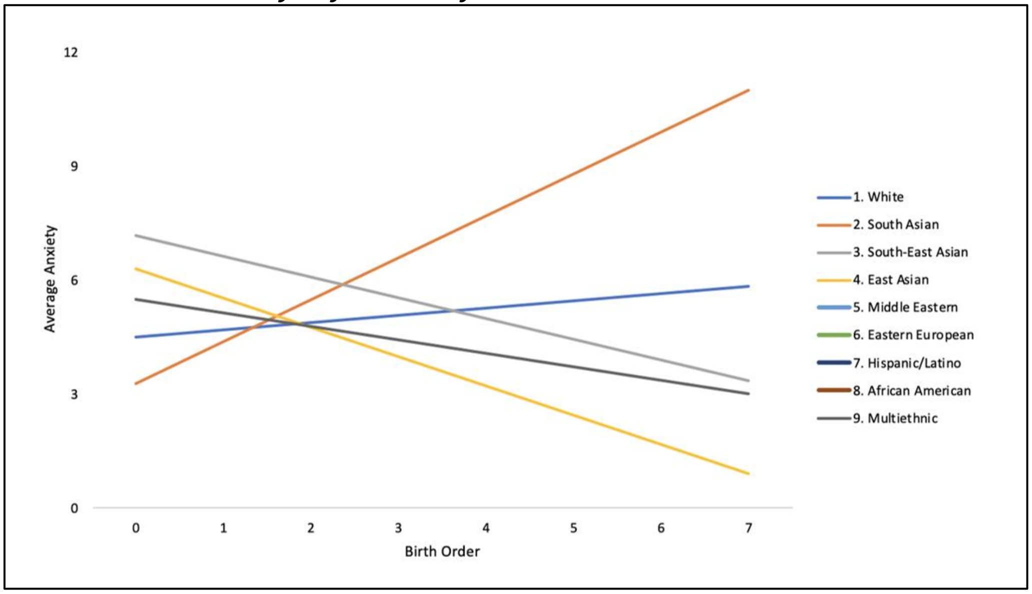
The linear regression portrays the correlation between the average means of avoidance, for each variable of ethnicity, and birth order. White and East Asian participants reported a positive correlation between avoidance and birth order meaning younger siblings scored higher on the scale of avoidance in comparison to older siblings who scored lower. South Asian, South-East Asian, and multiethnic participants reported a negative correlation between the average means of avoidance and birth order meaning older siblings scored higher on the scale of avoidance while younger siblings score lower. Figure 3 only includes five out of nine ethnic variables because the Middle Eastern, Eastern European, Hispanic/Latino, and African American variables have only one participant each, not making their results representative of the population.

As per the correlation between attachment-related anxiety and birth order pertaining to ethnicity, it was found that there was a weak positive correlation ($r = 0.410$). See Figure 4 below for the graphical display of this finding. Nonetheless, participants who identified as either White or South Asian, on average, portrayed a positive correlation between attachment-related anxiety and their birth order, while South-East Asians, East Asians, and multi-ethnic participants depicted a negative correlation. These results were significant ($p = < 0.001$).

The linear regression illustrates the correlation between the means of anxiety, per ethnic groups, in relation to birth order. White and South Asian participants depicted a positive correlation meaning younger siblings scored higher on the scale of anxious attachment while older siblings score lower. South-East Asian, East Asian, and multiethnic participants portrayed a negative correlation meaning younger siblings scored lower on the scale of anxious attachment while older siblings scored higher. Only five out of nine ethnicity variables are shown in Figure 4 because Middle Eastern, Eastern European, Hispanic/Latino, and African American categories only included one participant each, not making their results representative of the population.

Figure 4

Birth Order x Anxiety: by Ethnicity



Discussion

In summary of our results, we came across four main findings. The first finding is that there were no significant correlations between anxious attachment and birth order or between avoidant attachment and birth order. In conjunction, the second finding is that there were gender differences found for these correlations, albeit insignificant. Next, there were both significant and insignificant differences regarding participants' ethnicity. The final finding is that there was a weak, positive correlation between avoidant and anxious attachment, which was statistically significant. These findings are outlined and explained in connection to the current literature in the following sections.

Birth Order & Attachment

Firstly, we found no significant correlations between birth order and attachment style. In other words, whether an individual was first-born, second-born, etc., had little to no effect on their general attachment style. Our results contrast with previous findings from Isgor (2017), as their research articulated that middle-born children showed higher levels of secure attachment than their older or younger siblings, but our research showed no significant data to support this notion. The results of our research do align with findings from Kennedy et al., (2014), as they similarly discovered that birth order is not associated with the attachment style a child shares with their parent(s).

Gender Differences

Next, we found that there were some gender differences when it came to attachment styles. Individuals who identified as non-binary and were higher in birth order were more likely to adopt both an anxious and avoidant attachment style, which suggests that non-binary individuals who were amongst the younger of their siblings may view others as unreliable and unavailable according to theory of attachment (Ainsworth et al., 1978; Bowlby et al., 1956). Those who identified as male were more likely to have an anxious attachment style if they were a younger sibling, while those who were an older sibling were more likely to adopt an avoidant attachment style. This correlation alludes to the fact that men have the potential to view their relationships with others as unreliable and unavailable while also viewing others as inconsistent (Ainsworth et al., 1978; Bowlby et al., 1956). Lastly, female-identified participants were more likely to have an anxious and avoidant attachment style if they were an older sibling, meaning that they may view others as unreliable, unavailable, and inconsistent (Ainsworth et al., 1978; Bowlby et al., 1956).

Ethnic Differences

In addition, there were various findings regarding the correlation between ethnic identities, birth order, and attachment style. In regard to the avoidant attachment style, multi-ethnic participants who were amongst the oldest of their siblings were more likely to adopt this attachment style, which was insignificant. To contrast, White or Southeast Asian participants who were the younger of their siblings were likely to have an avoidant attachment, which was significant. Additional significant findings suggested that younger siblings who identified as White or South Asian and older siblings who identified as South-East Asian, East Asian or multi-ethnic were more likely to adopt an anxious attachment style.

Avoidance & Anxiety

Finally, our research revealed a minor yet statistically significant positive correlation between anxious and avoidant attachment. This aligns with the findings of Leenders et al., (2019) regarding the impact of attachment styles during job search. They reported a strong and significant correlation ($r = 0.38$, $p < 0.01$) between anxious and avoidant attachment (Leenders et al., 2019). Future studies involving larger sample sizes could benefit from controlling one variable when analyzing the other to minimize any potential confounding effects.

How Do These Results Contribute to Current Research?

One of the purposes for our research was to provide more information regarding attachment theory and we believe that our results show that there needs to be more research and experimenting done to determine if birth order does or does not have an influence on attachment styles. Our findings contribute support for the recent research that exhibits how attachment style and birth order are unrelated but continues to contradict other recent research that does display a correlation between the two variables. It is indicative of the implication that attachment can be the product of more than just birth order and the genetic or environmental factors that come with it. Thus, it is salient that more research should be conducted, and suggestions for future studies are outlined in the following sections.

Summary & Conclusions

To summarize, our research project was inspired by the prevalence of attachment theory in the field of social psychology which led us to develop our topic of researching the potential correlation between birth order and attachment style. The current available research is limited regarding the populations that have been studied and the lack of consistency and information regarding the effects of birth order on attachment style. The results of our research generally support the research negating the relationship between these variables, as well as the difference between the gender and ethnic demographics.

However, more research is needed to make definitive correlations or potentially even causal conclusions. The following sections will outline the limitations of our study as well as suggest areas for future research.

Limitations of Present Study

Participant Bias

While much precaution was taken to ensure the least number of limitations, there were certain variables and factors that could not fully be controlled. A limitation that exists within our study is the influence of personal bias regarding survey answers. There is a possibility that while answering questions relating to attachment style, students may respond according to how they perceive themselves to think and behave in certain scenarios, or based on what they think researchers are expecting of them. In reality, their behavioural and cognitive response may be different, thus, hindering the study's accuracy. For example, if a student responds to question 1 prompt (c), "I discuss my thoughts and feelings with others," with "(1) strongly agree," but in reality, they are unconsciously sharing or suppressing selective thoughts and feelings, this is the type of personal bias that alters the reliability and accuracy of the research results.

Attachment Survey Questions

Another main limitation of this study is that although there are four prominent styles of attachment, we only collected survey data for two styles, excluding secure and disorganized-disoriented attachment. While we can assume that those low in both avoidance and anxiety are generally more secure, we cannot make any correlation conclusions without quantitative data. Due to time and population restrictions, we chose to include two styles in our survey to ensure the survey was short and concise, while still collecting comprehensive data about attachment.

Sample Demographics

A third limitation of the study would be our limited sample size of 100 McMaster undergraduate students, which was due to time restrictions and external affairs. It is worth noting that due to the limited size and diversity of the sample, the results may not be generalizable or representative of a larger population. To illustrate, it is unlikely that the 6 participants (out of 100) who identified as non-binary are representative of the larger non-binary student population at McMaster. Similarly, it is unlikely that our overall conclusions can represent the general McMaster population when 76% of the participants identified as female.

Interpreting the Data

The nature of the research and participants involved posed some challenges with interpreting and generalizing the data. Since the research was not experimental, there was no random assignment of participants. Therefore, there is no guarantee of the representation of McMaster's undergraduate population, and we cannot infer any causal relationships. Additionally, the research is quantitative and not cross-sectional or longitudinal, making it difficult to obtain a deeper understanding of participants' family dynamics and style of attachment over time.

Western Perspective

A final limitation of the current study is that it takes a primarily Western perspective, from the theoretical foundations and literature review to the analyses of our survey data. Attachment theory is rooted in the work of British and North American researchers, and the articles examined were all conducted from the same cultural perspective. Our survey was created based on this research and although we did analyze differences based on ethnicity, no major conclusions or interpretations can be made without further analysis of attachment in different cultures. A literature review of any research indicating cultural differences in attachment and sibling studies is needed, not just within North America, but within Eastern countries as well.

Significant Insights & Future Research

Parenting Style & Birth Order

After thoroughly researching and analyzing attachment and birth order, it can be concluded that there is still a lot that is unknown. Many studies have consistently shown that there is some sort of correlation between attachment styles with parenting and that parenting styles are prone to change throughout the course of parenthood. However, these studies fail to explain if there is a direct correlation between birth order and attachment.

Furthermore, research is needed to gain insight into why there are outliers. While parenting styles will inevitably change, there are cases where subjectively “perfect” parenting leads to negative attachment styles, regardless of an individual’s birth order or vice versa. Therefore, it is important to gain an understanding regarding how much effect parenting styles really have on attachment styles and how much of it is just the influence of other genetic, social, and environmental influences.

Future studies can conduct more quantitative research in conjunction with qualitative research to better understand and interpret the quantitative results. More specifically, researchers can inquire about the differences or similarities in a caregiver’s parenting style and the home environment the participants come from. Furthermore, experiments can also be conducted in a controlled environment to determine any potential causal relationships. Then, we can begin to understand the relationship between these variables and identify ways to ensure consistent parenting among siblings, if necessary.

Twin Studies

There is limited research supporting the influence of genetic composition on attachment styles, with the majority of literature highlighting external environmental factors. Research by Pasco Fearon & Roisman (2017) highlights the potential influence of certain genes to influence attachment in twin studies, however, these results are generally not being replicated in current studies. Our study included only two individuals who had a twin sibling, so we did not calculate any correlations specifically for twins. Overall, more research is needed to determine the potential genetic influence on attachment by studying both monozygotic and dizygotic twins (or triplets, quadruplets, etc.) and comparing them with non-twin sibling research.

Gender Differences

The results of this research indicate some gender differences, although they were not statistically significant. Research specifically analyzing the difference in attachment based on gender identification is necessary, as it may point to greater structural influences on attachment style, or variables that may influence the relationship between attachment and birth order. For example, it seems plausible that men would be higher in attachment avoidance because they are not expected to show emotional vulnerability, which is a key trait of avoidant individuals (Miller, 2022). Our results displayed a trend for males to be more anxiously attached if they have a higher birth order and more avoidantly attached if they have a lower birth order, but this is likely due to the limited sample size and demographics. In addition, it would be significant for more research to include non-binary participants, as previous research only collected results from male and female participants. Our results suggested that non-binary individuals are more likely to have an anxious and avoidant attachment style, which could be due to the limited sample, but also extraneous variables influencing them as a marginalized group. Overall, more research is needed to reduce the gap in research regarding such gender differences.

Adolescent Research

There is limited research with adolescent participants, particularly older adolescents. Many studies include adult participants reflecting on their childhood experiences, which may not provide an accurate depiction of their experiences or attachment in childhood, nor how their attachment has changed since then. Cross-sectional and longitudinal studies are needed to determine how attachment is influenced in childhood by birth order and how it develops over time, especially within different demographics.

Concluding Thoughts

Overall, this research supports the finding that attachment is not significantly related to birth order, however, more research is needed to lessen the disparities in research findings on this topic. Our analysis of literature from the 21st century and our current data illustrate the need for further research in the following areas: (a) the influence of parenting styles on children, (b) twin studies to determine a potential biological influence on attachment, (c) gender differences among attachment development, and (d) more research generally involving adolescents, especially in cross-sectional or longitudinal research. These research topics will guide us toward a better understanding of attachment and its relationship to birth order and family dynamics.

Acknowledgments

We would like to acknowledge that McMaster University is located within the traditional territories of the Mississauga and Haudenosaunee nations. It is within the lands protected by the “Dish with One Spoon” wampum agreement, which binds the nations of the Haudenosaunee Confederacy to the Great Law of Peace. The “Dish” represents the shared land, and the “One Spoon” represents the idea of sharing and peace (McMaster University, n.d. b). It is with these philosophies in mind that we planned our research and had the privilege of conducting it.

We would also like to thank Dr. Sarah Clancy for supporting and guiding us through our research process. Furthermore, we would like to thank our fellow undergraduate students who shared and participated in our research survey.

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A Reflection on Contemporary Sexuality

Leila Cottin[1]

Abstract

A greater diversity can be observed in Western citizens' sexuality. The development of serial monogamy, polyamorous relationships and other practices have considerably expanded under what we can call a mass media age. Sexuality — or rather sexualities, as many sociologists and activists argue (Macionis et al, 2021.) — include three components: sexual identity/orientation, sexual behavior and sexual attraction. (Macionis et al, 2021.). Diversification of sexualities triggers a response from society that reciprocates this influence, making sexuality a social construct largely studied and reflected by sociologists. This paper delves into the idea that sexuality in the 21st century is a social construct influenced by our social environment including new technologies and media. Secondary sources were thoroughly used and analyzed to confirm the crucial influence of these media in constructing individual's sexuality, especially for the younger generation. It also put forward the dangers of this excessive merge of sexuality with the media.

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Comparing the Psychological Well-being of International and Domestic Students

Laurie Baker[1], Shaza Zahir Hassan[1], Christine Huang[1], Karolina Kalashnikova[1], Monserrat Ramirez Ruvalcaba[1]

Abstract

Post-secondary students are an at-risk category in need of immediate assistance as previous research indicates that they experience high levels of both stress and negative emotions in addition to having poor physical and mental well-being. As such, many institutions now focus on addressing the needs of their students to better assist, support and improve their psychological well-being. Considering that international students make up a significant and growing portion of the McMaster community, it is crucial to provide adequate support to better address the needs of this student population. Thus, the intention of this paper is to explore and compare the psychological well-being of international students and domestic students. We focused on three different dimensions of psychological well-being as they pertain to each participant: help-seeking behaviour, social support, and relatedness. Domestic and international students have different lived experiences which may influence these dimensions, consequently impacting their psychological well-being in distinct ways.

Gaining a more comprehensive understanding of this comparison allows for greater acknowledgement and a wider range of perspectives to be considered when analyzing the psychological well-being of university-level students. This may help influence or shape university policies to improve the support it provides to both international and domestic students along the three dimensions discussed. Our primary research is still in progress, however, we hope to identify the level of psychological well-being experienced by international and domestic students and analyze the different factors that may have an effect on discrepancies or similarities that may arise.

We used the quantitative research methodological approach of an anonymous online survey on the MREB-approved platform, LimeSurvey. The survey was made up of 30 questions in different formats – open-ended and close-ended. We recruited our target population for this research - international and domestic undergraduate students studying at McMaster University who are 18 years of age or older - via social media posts and physical flyers. A pre-approved list of MSU student-led clubs was contacted about sharing our research with the members.

Additionally, physical flyers were posted on pre-approved areas around McMaster University buildings to attempt to attract those individuals who may not have any club involvement as well.

While both domestic and international students have unique lived experiences and circumstances that might impact their life satisfaction and psychological well-being differently, international students tend to experience additional stressors such as increased barriers in accessing mental health resources related to cultural differences and stigma. By examining undergraduate students' well-being on three dimensions, we expect to be able to identify the role that social support systems and a sense of connectedness to the

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McMaster community play in the psychological well-being of international and domestic students.

Grateful Students: An Intervention to Increase Satisfaction with Life

Yumna Qaisar[1]

Abstract

This study employs the use of secondary research to inform its theory, methodology and results. Gratitude has become a popular positive concept that many wish to engage with to increase their life satisfaction. One method of showing gratitude is through the act of praying (Lambert et al., 2009). Performing acts of gratitude has been seen as a popular activity amongst undergraduate students. Praying has been identified as a salient activity amongst self-identified spiritual-but-not-religious (SBNR) students (Schnitker & Richardson, 2019). Currently, the common limitation amongst research studies is that they have neglected to investigate SBNR undergraduate students to examine a gratitude intervention that involves the frequency of vocal praying to enhance life satisfaction. Past and present research currently assess this relationship concerning monotheistic religions, mainly Muslim and Christian students (Schnitker & Richardson, 2019; Gabana et al, 2020; Kraus et al., 2015). Thus, this gap in the area of research begs the question of: Does framing gratitude as a vocal praying intervention increase life satisfaction amongst self-identified spiritual-but-not-religious undergraduate students? It is designed to recruit 150 undergraduate students from a first-year psychology course and employ snowball sampling technique (Schnitker & Richardson, 2019). The participants were to fulfill three requirements to participate which included that the student must self-identify as spiritual-but-not-religious, must reside in the Greater Toronto Area and must have an undergraduate status. Participants were to complete a pre-test online scale using the Satisfaction with Life Scale (SWLS) (Diener et al., 1985). Afterwards, participants were randomly assigned to one of three conditions which ranged from engaging in vocal prayer once daily for four weeks to engage in vocal prayer once a week for four weeks. Participants were tasked to write down 3 things they were grateful for in that day or week and record themselves reciting what they wrote. Lastly after the four weeks, all participants were instructed to re-engage with the online Satisfaction with Life scale. The overall predicted results suggest that those prior to the intervention scored moderate to low on the SWLS. However, post-intervention would suggest that those who engaged with the intervention more often than those who did once a week would score moderate to high on the SWLS. The implications for this intervention suggest that it can be a protective factor against self-injurious behaviors, demonstrate wellness behaviors, and allow one to have a clear outlook on their goals (Kress et al., 2015; Green et al., 2020; Van Dyke et al., 2009).

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Hate Truly is the Virus: A Major Research Paper on Anti-Asian Hate Incidents During the COVID-19 Pandemic

Christina Doan[1]

Abstract

This article focuses on past and current anti-Asian hate occurrences in North America. The COVID-19 pandemic has resulted in a surge of cases; however, it has also brought forth a new and disturbing trend: racially motivated hate crimes against Asian-Americans and Canadians. Despite the virus affecting individuals of all races, ethnicities, and nationalities, the Asian community has become a target of blame and discrimination. This research examines anti-Asian events that took place prior to the pandemic, such as the Pacific Coast Race Riots of 1907 and documented instances of anti-Asian hate crimes, as well as the harmful perceptions of Asian individuals that persist in Western societies. Analyzing the reports from national-level grassroots organizations reveals a steady increase in anti-Asian hate crimes each year. This study also shows that Asian women in both the U.S. and Canada were disproportionately targeted. This research may be used to acknowledge the urgency of addressing and combating this issue in order to protect and support the safety and well-being of the Asian community.

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How Romantic Relationships Influence the Subjective Well-Being of McMaster University Undergraduate Students

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Abstract

It is evident that the time of adolescence and young adulthood is crucial to our social development. Particularly, past research has found that the romantic relationships we form with others throughout our adolescence are an important part of our social interaction (Roberson et al., 2018). The fields of positive and social psychology are interested in the idea of social relationships and their effects on subjective well-being. Introduced by Ed Diener in 1984, subjective well-being was coined to conceptualize the way people understand their own well-being (Diener, 1984). Researchers in this field explore three components: frequent positive affect, infrequent negative affect, and a cognitive evaluation such as life satisfaction (Tov & Diener, 2013). In past research, there has been minimal evidence that explains how subjective well-being and romantic relationships intersect. Therefore, our area of research focuses on romantic relationships and their influence on the subjective well-being of McMaster Undergraduate Students. This is a group-based thesis for the Honours Social Psychology Program at McMaster University (Social Psychology 4ZZ6, supervised by Dr. Sarah Clancy). We believe this is important as romantic relationships among university students are identifiably one of the most impactful social relationships they will establish within the duration of their educational career. Our approach to this topic will differ from previous studies as we will look at social comparisons, resilience, and loneliness/Covid-19 as mitigating factors to determine the results of our research.

We are currently in the process of collecting quantitative data to conduct primary research. This is being done through an anonymous online survey on the MERB approved platform LimeSurvey. It is important to note that non-probability and convenience sampling will be used throughout our recruitment of participants. We have reached out to various clubs and communities at McMaster with approval of the Ethics board as we aim to collect data from McMaster undergraduate students who are 18 years of age and older. Overall, the survey consists of approximately 30 questions, that are both close and open ended.

Once we have completed data collection, we aim to find results that should be able to provide insight into the personal experiences of McMaster undergraduate students. We hope to find if factors such as indulging in social comparisons, characteristics of resilience, and feelings of loneliness directly or indirectly impact romantic relationships and subjective well-being. In other words, there should be a significant correlation between the two variables: romantic relationships and subjective well-being.

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Implications of Access to Education for the Underprivileged: A Secondary Study of Intersectionality

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Abstract

In this literature review, I examine and analyze the effects of intersectionality on the lived experience of minorities in post-secondary education, specifically focusing on the impact of race, class, and gender. I review the actual experiences of those who have had their post-secondary careers influenced by their intersectionality, and how they have overcome their struggles to ensure they complete their studies to the best of their abilities. This review allows for further work to be done to improve the conditions which the underprivileged experience. This analysis acknowledges the excess amount of hardships that people with multiple social categories face by drawing on evaluations of Patricia Hill Collins' Matrix of Domination (2000) and Kimberle Crenshaw's Intersectionality Theory (1991). The investigation of how these theories are interdependent with people's lived experiences can aid in changing the fundamental and systematic processes of the current education system. The research shows that there is a strong relationship between race, class, gender, and success rates in post-secondary education, thus establishing a firm foundation for the creation of an intersectional approach in universities and colleges.

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Prayer's Ability to Combat a Decrease in Subjective Well-Being

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Abstract

Subjective well-being (SWB) plays an extremely valuable role in an individual's life by laying the foundation for assessing their overall life satisfaction. Due to its significance, it has become a heavily researched topic in the field of Social Psychology. Unfortunately, a lot of this research has suggested that SWB seems to decline in adolescence for many people. The aim of this paper is to research the act of praying as an intervention that may help combat this decline through typically accessible means. To do this, the Conservation of Resources theory (COR) is used to take a theoretical approach to how the act of praying has shown improvements in SWB. COR claims that individuals' desire to secure different resources will benefit their lives and promote higher levels of well-being; in this case, practicing prayer is seen as resource gain (Bickerton & Miner, 2021). The research was conducted by seeking out published research that examined how praying may or may not have led to an increase in SWB within their samples.

Examining empirical studies that each focused on different demographics and different forms of SWB was intentional so that the conclusion drawn from this examination may be more applicable to the general population. After examining three separate empirical studies, a thorough analysis was conducted to determine whether the results indicated that praying is truly an effective intervention to combat a decrease in SWB. These studies include a longitudinal study that examines the effect of praying on kindergarten students' general SWB (Pandya, 2018), a cross-sectional study that examines participants with past traumas and how praying has led to posttraumatic growth (PTG) (Harris et al., 2010), and a second longitudinal study that examines self-identifying Christians and how certain types of prayer and identification leads to greater life satisfaction (Krause & Hayward, 2013). Ultimately, while noting the study's limitations, it seems that there is indeed a correlation between prayer and an increase in SWB. The analysis of the studies showed that praying led kindergarten students to experience a heightened SWB, trauma survivors to experience greater PTG, and higher levels of general life satisfaction in adults who prayed often. Because the concept of SWB can be generalized to many aspects of one's life, examining studies that cover different demographics, different areas of improvement in SWB, and the comparison of non-religious and religious individuals using prayer as an intervention allowed the drawn conclusion to account for a large proportion of people.

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Rates of Imposter Syndrome Among Female-Identifying Individuals in Undergraduate STEM Programs at McMaster University

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Abstract

Many academic professionals lack internal validation for their successes and fear exposure as an intellectual fraud, despite high academic excellence and achievement. This phenomenon is known as imposter syndrome, characterized by an individual lacking an internal sense of success, regardless of achievements, resulting in feelings of ‘intellectual phoniness’ (Clance & Imes, 1978). This research was conducted as part of a group-based thesis for SOCPSY 4ZZ6 and had received MREB ethics approval. Our research will be analyzed using an intersectional approach as it offers an understanding that multiple systems are at play. The origins of imposter syndrome focus on female-identifying individuals in academics, and the social psychological experiences associated with the contributing factors (Clance & Imes, 1978). Imposter syndrome can be understood as cognitive distortions arising from a combination of family dynamics, gendered social expectations, and historical representations of scholars (Clance & Imes, 1987; Meyers, 1978; Edwards; 2019). This produces an agent of socialization informing female-identifying individuals about the roles related to being a scholar. Imposter syndrome is maintained through these cognitive distortions and the associated behaviours. These behaviours include individual interpretations of capabilities, accomplishments, and behaviours to avoid exposure (Gadsby, 2022; Clance & Imes, 1978).

Previous research shows that female-identifying individuals in STEM programs experience gendered expectations, biases, and stereotypes within male-dominated fields, creating barriers as a result of gender discrimination (O’Connell & McKinnon, 2021; Crawford, 2021). This includes the ‘lack of fit’ model, tightrope bias, and prove-it-again bias, all of which can produce negative psychological effects (O’Connell & McKinnon, 2021; Crawford, 2021).

This research aims to determine if rates of imposter syndrome are higher for female-identifying individuals in male-dominated fields. Additionally, we aim to observe the factors contributing to the persistence of imposter syndrome. We are currently recruiting Undergraduate McMaster students and are collecting data using an online, anonymous application, Lime Survey, to collect both qualitative and quantitative results to evaluate the levels of imposter phenomenon among undergraduate students at McMaster. We hope the quantitative data will provide insight into the prevalence of imposter syndrome, and the qualitative results will show specific factors contributing to this phenomenon. Once data collection is over, we believe our analysis will show that women-identifying individuals will show higher rates of imposter syndrome and higher rates for those in STEM programs. Our aim is for the results of this study to spotlight the effects a male-dominated field has on younger women-identifying individuals entering into adulthood. We hope these findings will allow us to apply it to our own lives as students and future students entering STEM fields.

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Working *in* the Kinks: Exploring the Use of Kink to Empower Queer People

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Abstract

As the debate about kink's place within the LGBTQ+ community, particularly at pride, continues to rise, the divide between kinky and 'vanilla' queer people seems more prominent than ever. While the leather body suits, black stiletto boots, and ball gags may look intimidating initially, kink's relationship with the LGBTQ+ community has been enduring, positive, and meaningful. In fact, sexual and gender minorities have long played a foundational role in the development of the kink community and vice-versa.

This paper uses both qualitative and quantitative secondary research to synthesize three benefits of the presence of kink in queer spaces. These include increased involvement with the LGBTQ+ community and its history, the processing of trauma resulting from living as a marginalized individual and using kink as a method to reclaim societally ascribed labels of deviance. Through the exploration of these topics, it has become clear that the participation of sexual and gender minorities within the kink community is an effective means of empowering LGBTQ+ people and increasing pride in one's queer identity. Furthermore, this paper intends to prompt further nuance in the discussion about kink's place at pride and the LGBTQ+ community at large.

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