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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.

Acknowledgments

The MUJSP team would like to convey our heartfelt gratitude to everyone that made this year's issue possible. This includes faculty members, the editorial team, and the authors of the featured articles and abstracts.

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Dr. Sarah Clancy

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Graphic Designer
Julia Duguid

Celebrating the fifth year of publication of the McMaster Undergraduate Journal of Social Psychology

A warm welcome and happy reading of the fifth issue of the McMaster Undergraduate Journal of Social Psychology (MUJSP)! It is incredible to celebrate the fifth publication of the MUJSP. This would not be possible without the inspiring idea of creating an outlet for undergraduate research of then fourth-year Honours Social Psychology undergraduate student, Namya Tandon, back in the Fall of 2019. The first edition of the MUJSP was published in Summer 2020. Since that time, Namya has inspired and encouraged countless social psychology student peers to share their important undergraduate research work through the journal, reaching a wider audience well beyond the 4ZZ6 capstone classroom walls. As part of celebrating the fifth publication of the MUJSP, I want to recognize all the students involved in the MUSJP editorial team since 2020 who have made this publication possible every year. A huge thanks also goes out to all published students – thesis students and students with published abstracts from the Social Psychology Undergraduate Conference.

The list of amazing student editorial members from 2020-2024 include:

2020

- Namya Tandon, Editor-in-Chief
- Ranuli DeSilva, Assistant Editor
- Jordan Graber, Graphic Designer

2021

- Namya Tandon, Editor-in-Chief
- Raisa Jadavji, Co-Assistant Editor
- Angelo Marmolejo, Co-Assistant Editor
- Christina Doan, Layout Editor
- Jordan Graber, Graphic Designer

2022

- Raisa Jadavji, Editor-in-Chief
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- Christina Doan, Layout Editor
- Sarah McBride, Graphic Designer

2023

- Linette Sapper, Editor-in-Chief
- Angelo Marmolejo, Co-Assistant Editor
- Ayma Iqbal, Co-Assistant Editor

- Christina Doan, Layout Editor
- Sarah McBride, Graphic Designer

2024

- Ayma Iqbal, Editor-in-Chief
- Christina Doan, Co-Assistant Editor
- Paula Sheron Quieroz, Co-Assistant Editor
- Chelsea Zhang, Layout Editor
- Julia Duguid, Graphic Designer

THANK YOU TO AN AMAZING GROUP OF MUJSP EDITORIAL MEMBERS FOR YOUR DEDICATION, PASSION, COMMITMENT, HARD-WORK, PROFESSIONALISM AND TIRELESS WORK! YOU ARE INCREDIBLE, FANTASTIC, AND AMAZING INDIVIDUALS – THE JOURNAL WOULD NOT HAVE BEEN POSSIBLE WITHOUT YOU!

There have been several transitions in the editorial team of the McMaster Undergraduate Journal of Social Psychology for 2024. Linette Sapper, who graduated in 2023 from the Social Psychology Program, has stepped down as Editor-in-Chief. Linette has been an excellent leader for the editorial team during her tenure as Editor-in-Chief. The entire MUSJP team thanks Linette for her many contributions over the years in positions such as Editor-in-Chief and Co-Assistant Editor. Linette – thank you for your contributions to the McMaster Undergraduate Journal of Social Psychology over the years – you are awesome, and your hard work has not gone unnoticed! You will be greatly missed, but the entire team wishes you success in all your future endeavours.

I am pleased to welcome Ayma Iqbal to the role of Editor-in-Chief. Ayma recently graduated from the Social Psychology Program in June 2024. I had the pleasure of supervising Ayma's group thesis in 2023/2024, as well as teaching Ayma in undergraduate courses. Like many Editors-in-Chiefs of the past, Ayma is not new to the MUJSP. In 2023, Ayma served as Co-Assistant Editor. Ayma has taken on the new position of Editor-in-Chief with an impressive level of dedication, passion, and interest in seeing the work of fellow peers showcased in the MUJSP. Ayma – thank you for your many valuable contributions over the years to the MUJSP and for taking on the role of Editor-in-Chief in 2024 – you are wonderful, and your hard work and dedication are much appreciated! The journal is so lucky to have Ayma in the role of Editor-in-Chief this year!

There have been several other transitions at the McMaster Undergraduate Journal of Social Psychology over the past year. Angelo Marmolejo has left the role of Co-Assistant Editor, along with Sarah McBride who served as Graphic Designer. We thank Angelo and Sarah for their many contributions and dedication to the MUJSP over the years. Christian Doan has transitioned from Layout Editor to Co-Assistant Editor, along with Paula Sheron Quieroz who is joining the journal for the first time in this role. We also want to welcome Chelsea Zhang as Layout Editor, and Julia Duguid as Graphic Designer, both

joining the MUJSP for the first time. A very warm welcome to Paula, Chelsea, and Julia! The entire MUJSP team sends best wishes and thanks to Linette 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 2023-2024 Social Psychology capstone class consisted of 18 thesis project groups with 101 enrolled students. This year, there were six 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 2024 published papers highlight the socially relevant, interesting, and informative topics under investigation, including (ordered alphabetically by study title): **Behind the Screens: Investigating the Influence of Social Media on Self-Presentation, Self-Perceptions, and Perceptions of Others** by Sandra Erceg, Sydney Hunking, Harleen Pannu, Zunaira Babar, Amatul Rauf, and Romaisa Shah; **Climate Change and Student Stress: The Impact of Climate Change on the Mental Health of University Students** by Carly Black, Konstantina Dimogerontas, Sarah Ordean, Abby Pomeroy, Ava Shepherd, and Vishmini Jayatunge; **Examining the Relationship Between Attachment Styles, Academic Performance, and Mental Well-Being in McMaster University Undergraduate Students** by Sara Hossein, Ayma Iqbal, Alisa Karban, and Duygu Turkmen; **Exploring the Impact of Parenting Styles on the Well-Being of McMaster University Undergraduate Students** by Mia Dimovski, Madeline Facey, Kyla Guerriero, Sierra Marques, Madeline Rawlings, and Sofia Sousa; **Families Behind the Filter: How Social Media Influences Undergraduate Students Perceptions of Parenthood** by Valentia Ademi, Rachel Helling, Kayla Lewis, Alexandria McIntosh, Saira Uthayamukar, and Phoebe Wang; and, **Social media, social comparison, and its impact on mental health and well-being of McMaster University undergraduate students** by Maxima Chu, Rachel Humeniuk, Sarah Ierulli, Jessica Langton, Zara Malik, and Christy Tenn.

Since the very first publication of the MUJSP in 2020, the student papers have delved into the social worlds and pertinent issues of concern and interest among the undergraduate student population at McMaster University. The collection of papers in this year's publication are no different. Three papers examined the impact of social media in different facets of life, including on perceptions of parenthood, on self-presentation and perceptions of self and others, and in terms of social comparison and impact on mental health and well-being. Further, three groups investigated the impacts on mental health in relation to parenting styles, climate change, and attachment styles. Throughout the five-year history of the MUSJP, the student thesis papers and research have underscored 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 2023-2024 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 2023-2024 academic year, please see this link: https://socialpsychology.mcmaster.ca/congratulations-2023-2024-socpsy-4zz6-capstone-students-on-your-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 third 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 2024 conference at this link: https://socialpsychology.mcmaster.ca/congratulations-presenters-and-conference-developers-organizers-on-the-2024-3rd-annual-social-psychology-undergraduate-research-conference/

I hope you enjoy reading the important, interesting, and socially relevant social psychological research studies of the six respective groups featured in the fifth issue of the McMaster Undergraduate Journal of Social Psychology, along with the conference abstracts from the third annual Social Psychology Undergraduate Research Conference. I hope all readers can take a moment to reflect on the important legacy of the MUJSP and the opportunities it has provided to so many students in the Social Psychology Program at McMaster. As always, 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 fifth 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: Ayma, Christina, Paula, Chelsea, and Julia, who serve as editorial board members this year, along with the six groups who were eligible for publication this year and the individuals and groups with published abstracts from the 2024 Social Psychology Undergraduate Research Conference. Congratulations to all involved in the publication of the fifth issue of the McMaster Undergraduate Journal of Social Psychology – you have all made an indelible impact on the lives of Social Psychology students - past, present and future!

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 fifth issue of the McMaster Undergraduate Journal of Social Psychology! I hope you're as excited as I am to read the compelling capstone research papers from fourth-year students within the Social Psychology program, as well as the abstracts from this year's Social Psychology Undergraduate Research Conference.

I want to begin by expressing my sincere gratitude to this year's Editor-in-Chief, Ayma Iqbal. Ayma has seamlessly transitioned from Assistant Editor to Editor-in-Chief and has done an outstanding job of bringing together many new faces to the editorial team this year. Thank you, Ayma, for your dedication to this role; your hard work does not go unnoticed, and I appreciate everything you have done to ensure the MUJSP continues to recognize students' achievements.

I also want to recognize the rest of our amazing editorial team. Thank you to our two diligent Assistant Editors, Paula Sheron Quieroz & Christina Doan, our Graphic Designer, Julia Duguid, and our Layout Editor, Chelsea Zhang. The effort and consideration each of them has put into their roles to produce the current issue is greatly appreciated. Of course, I would also like to thank Namya Tandon, our first ever Editor-in-Chief and founder of the MUJSP. The Social Psychology community at McMaster is so lucky to have this collaborative space to celebrate students' achievements and we continue to appreciate Namya's creation with each new issue of the journal.

Finally, I would like to extend my gratitude to our incredible Faculty Advisor, Dr. Sarah Clancy, whose dedication to the MUJSP has been unwavering from the start. Dr. Clancy's continued support and recognition of her students is truly remarkable, and I am immensely thankful not only for having the privilege of being one of her students during my undergraduate years, but also for the opportunity to work closely with her during my time as Editor-in-Chief for the previous issue. From the moment I joined the editorial team, Dr. Clancy made me feel welcomed, and I've watched her extend that same warmth to every new contributor to the MUJSP, whether they are authors or editors. She has fostered an environment that is both collaborative and inspiring – one that all of us are proud to be a part of. Thank you for everything, Dr. Clancy; your students appreciate you more than you know!

My time on the MUJSP editorial team, both as an Assistant Editor and as Editor-in-Chief, has been an incredibly rewarding experience, and I am confident that I am leaving it in very capable hands. I look forward to watching this journal continue to grow and showcase the impressive work of McMaster's Social Psychology students with each new issue.

A heartfelt thank you to everyone who continues to support the MUJSP; it has been a pleasure to work with all of you. I hope you enjoy reading the outstanding research

papers presented in the 2024 issue!

Best,

Linette Sapper
Outgoing Editor-in-Chief

Letter from the Editor

Dear MUJSP Readers,

It is my pleasure to present you with this year's issue of the McMaster Undergraduate Journal of Social Psychology. The MUJSP, now in its fifth year of publication, continues to recognize and highlight the achievements of final-year undergraduate students in the Honours Social Psychology program and the participants at the 2024 McMaster Social Psychology Undergraduate Research Conference.

This past year, six theses and 10 abstracts met the meticulous publication eligibility criteria for the MUJSP. The six research projects cover a vast array of topics, ranging from climate change and mental health, the influence of social media on student perception of parenthood, and the relationship between attachment styles and academic achievement in young adults. Moreover, 10 abstracts from the annual Social Psychology Undergraduate Research Conference cover research areas such as attachment styles and sexual dynamics, the experiences of police, and international student identity.

I am honoured to share the 2024 issue of the MUJSP with you all as Editor-in-Chief. I extend my gratitude to Namya Tandon, the founder and original Editor-in-Chief of the MUJSP, who paved the way for the publication of valuable research in the field of social psychology. I would also like to extend my thanks and admiration to Linette Sapper, our outgoing Editor-in-Chief. Working under Linette as an Assistant Editor for the 2023 issue taught me valuable lessons about leadership, and assuming the position of Editor-in-Chief was a fortunately smooth process thanks to her continued guidance.

The publication of this issue would not be possible without our lovely editorial team. I would like to extend my gratitude to our two amazing assistant editors, Paula Sheron Quieroz, and Christina Doan, our former layout editor. I would also like to thank Chelsea Zhang, our new layout editor, and Julia Duguid for designing our issue cover. Moreover, I convey my appreciation for the research conference organizers, Megan Lee and Paula Sheron Quieroz, who aided in the publication of the abstracts presented earlier this year. Finally, I would like to thank Dr. Sarah Clancy, our faculty advisor. Thank you, Dr. Clancy, for your continued support and guidance for the editorial team, and your unwavering dedication to the success of this journal and every student whose work has been published within it.

On behalf of the editorial team, thank you for taking the time to read the thoughtful and engaging research published in the 2024 issue of the MUJSP. We hope you enjoy reading these papers as much as we did. Thank you for your support!

Sincerely,

Ayma Iqbal
Editor-in-Chief

Behind the Screens: A Study Investigating the Influence of Social Media on Self-Presentation, Self-Perceptions, and Perceptions of Others at McMaster University

Zunaira Babar[1], Sandra Erceg[1], Sydney Hunking[2], Harleen Pannu[1], Amatul Rauf[1], and Romaisa Shah[1]

Abstract

This study explores the multifaceted impact of social media on students' self-presentation, self-perceptions, and perceptions of others. The study investigates these impacts through a mixed-methods approach using an online survey of McMaster University students. The results show that students often curate their online personas to meet social norms and expectations, leading to discrepancies between their online and offline identities. This curation, driven by a desire for social validation and fear of negative judgment, heightens self-consciousness and alters self-perceptions. Additionally, the study found that exposure to idealized representations of peers exacerbates feelings of inadequacy and competitiveness, impacting students' mental well-being and social interactions. These findings highlight the need for greater awareness and educational initiatives to encourage healthier social media use among students. This research enriches the literature on digital identity formation and underscores the intricate relationship between social media use and psychological well-being.

Introduction

The ubiquitous influence of social media platforms has reinvented how we perceive ourselves and others. Social media allows users to carefully curate their identities online, controlling the image they present to others. With each individual able to create an online persona, users can present a filtered, idealized version of themselves. With popular platforms such as TikTok, Instagram, Facebook, and X (formerly known as Twitter), users can interact with others whom they may not know in real life, judging them solely on their social media profile. As a result, the line between the physical and digital worlds can become blurred, leading to potential harm, such as comparison and the need to curate a likeable online identity. This harmful culture of aesthetics has infected the internet and the lives of those who consume social media. Individuals feel the need to show a specific persona and lifestyle online for others to see and crave validation from it. With the hyper-glamorized online world, individuals are comparing their real lives to the filtered lives of those they interact with online. Our research examined the influence of social media on undergraduate students' perceptions of themselves and others and its impact on their

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interactions. Our data collection took place from November 2023 to February 2024 using an anonymous online survey. We surveyed undergraduate students from McMaster University aged 18 and older.

Purpose of Research

Social media use is inevitable in today's society and has fundamentally changed how people interact and present themselves online. Among university students, social media can significantly influence identity formation, friendships, and self-esteem. Therefore, our purpose for conducting this study was to understand the complexities that intertwine social media, society, and psychology, as well as their effects on individuals and relationships. Through our research, we wanted to understand the dynamics of social media, how this affects university students' perception of themselves and their peers, and the authenticity of online personas.

Overview of Paper

Within this paper, we provide a literature review which discusses previous research related to our study and some areas wherein research is lacking. We then identify the fundamental theories used to guide our research, including Festinger's Cognitive Dissonance Theory, Goffman's Dramaturgy, Brewer's Optimal Distinctiveness Theory, and Swann's Self-Verification Theory. Next, we provide our methodology, which describes how we conducted our research. This includes recruitment, data collection, and data analysis. Here, we also address ethical and methodological concerns and how we ensured proper ethics throughout our research collection. Following our methodology, we present the results of our research with charts, graphs, and figures. We then present our research analysis, discussing the results and linking them to major social psychological theories and previous literature. Lastly, we encapsulate the content of our research findings and offer some final reflections.

Literature Review

In today's revolutionized era, social media has become integral in shaping how we present ourselves and perceive others. With the vast available platforms such as Facebook, Snapchat, TikTok, X, Instagram, etcetera, individuals are exposed to microtrends and aesthetics promoted through these platforms, creating a one-dimensional conforming culture. Our literature review investigated the multifaceted repercussions of social media on self-presentation and the implications of the perceptions we form of others. The easy accessibility and availability of such platforms give individuals ample opportunities to share a developed perception of their own identity, inadvertently feeding into the cycle of conformity. Simultaneously, these platforms provide individuals with a window to observe and compare the lives of other users, reinforcing their negative thoughts and feelings about themselves. Self-presentation and perception of others from the social media angle have been thoroughly examined as subjects of interest. As mentioned earlier, social media platforms are vastly accessible and available, allowing individuals ample opportunities to curate their online identities. Goffman's (1959) work on impression management has set the foundation for understanding how self-presentation and identity formation are influenced on social media platforms.

Identity Formation (the way we present ourselves)

In analyzing the repercussions of social media platforms on individuals, a prevalent recurring theme pertained to the influence on the intricate process of identity development. This process encompassed the nuanced dynamics through which individuals curate their external self-presentation and influence their self-perception concerning this constructed image. The research gathered on this topic looked into the roles self-esteem, clarity of self-concept, self-monitoring and social anxiety play in our identity formation (Fullwood et al., 2020), the "false Facebook-self" (Gil-Or et al., 2018, p.1), along with the role feedback such as likes and comments play in identity formation (Bracket-Bojmel et al., 2015), the role social media platforms play in image management (Lalancette & Reynauld, 2017), the potential implications of when your beliefs and values associated with your identity is threatened (Vraga, 2014), the outcomes tied to self-expression in the context of building rapport, and connections to enhance mutual understanding (Bargh & Fitzmons, 2002), the driving forces behind individuals adopting inauthentic personas on social media platforms (Mun & Kim, 2021), lastly, the factors that shape an individuals' behaviour on pan-entertainment mobile live broadcast platforms (Zhang & Pan, 2023).

The study by Fullwood et al., (2020) explored to what extent an individual's self-esteem, clarity of self-concept, tendency for self-monitoring, and social anxiety predict different ways people present themselves online. This study further emphasized the complex nature of online self-presentation behaviours in correlation to distinct personality variables (Fullwood et al., 2020). A cross-sectional survey was conducted online that involved participants from Australia, the United Kingdom, and the United States. The participants ranged from 18-72, with 405 completed surveys (Fullwood et al., 2020). The results indicated that individuals with higher clarity regarding self-concept and self-monitoring were likelier to showcase a singular, consistent self, online and offline.

Furthermore, young adults with more significant social anxiety presented an idealized self-image online. This discovery was relevant to our study, as it implied that individuals characterized by heightened insecurity or limited self-awareness are more inclined to partake in activities such as crafting an idealized online self-image. They do so to manage their perception of themselves, thereby cultivating a more regulated and orchestrated identity. Additionally, participants with higher social anxiety and lower self-esteem preferred online communication over in-person interactions (Fullwood et al., 2020). On the other hand, adults who lacked explicit self-concept withheld lower self-esteem and engaged in minimal self-monitoring demonstrated more interest in presenting multiple versions of themselves online. Some limitations within this study indicated that the sample can only partially be generalized as most of the participants were women. The study needed more inclusivity, as men and older adults were overlooked (Fullwood et al., 2020).

Gil-Or et al., (2018) discussed the phenomenon classified as the "false Facebook self." The research delved into how using Facebook and other social media platforms may encourage individuals to portray themselves falsely, potentially leading to reduced well-being and psychological issues. The study employed an online survey completed by 258 participants, including 183 females, 62 males and 13 individuals whose gender was not identified. The study's findings suggested that, on average, Facebook users tend to believe that their online persona differs from their true selves (Gil-Or et al., 2018).

Furthermore, the research also proposed that Facebook offers positive social rewards to people who experience challenges in social interactions by allowing them to craft a deceptive online identity (Gil-Or et al., 2018). Therefore, it plays an essential role in understanding how social media influences the construction of one's identity, as it shows that people tend to tailor their online image to project a particular self-concept. The social rewards further reinforced the act of creating tailored online identities, perhaps normalizing it. A notable limitation of this study is the potential influence of social desirability bias. The study acknowledged that participants may have been more inclined to present themselves in ways they believed would be acceptable and socially desirable to the researchers, mainly because the data was collected through an online questionnaire (Gil-Or et al., 2018).

This analysis by Lalancette and Reynauld (2017) focused on the effects and implications of image management on social media using Justin Trudeau's, the Prime Minister of Canada, Instagram account. The researchers employed a methodological approach that integrates quantitative and qualitative analyses to scrutinize the content of Trudeau's Instagram feed. Their examination concentrated on diverse aspects, including the portrayal of his leadership style, the integration of his personal life into his posts, and how these elements are strategically leveraged to reinforce the values and principles of the Liberal Party. Their study highlighted how Instagram can be a valuable tool for individuals to present a particular curated image of themselves. For example, Lalancette & Reynauld (2017) found that Trudeau has strategically utilized Instagram to present himself as a youthful and positive politician, further suggesting that the social media platform has helped Trudeau build and maintain his image as a polished and professional politician, enhancing his credibility, likability, and his overall appeal to a broader audience. Social media platforms can redefine public standards for evaluating individuals, especially politicians and their performance (Lalancette & Reynauld, 2017). From this study, it is essential to realize how social media can be a platform for individuals to shape their identities and influence how we perceive ourselves and others. By providing us with an accessible platform to curate our images and public personas intentionally, we are essentially controlling the narrative and perception of others.

Vraga (2014) expanded upon prior research by examining the potential implications on individuals when their foundational political identity is threatened. They adopted a classic dissonance paradigm by getting their participants to write a "counter-attitudinal essay… to a political context by manipulating the topic of the essay to advocat[e] membership in the opposing political party" (Vraga, 2014, p. 487). The study emphasized the role of political conflict and dissonance in shaping political attitudes and behaviours, particularly in the context of party affiliations (Vraga, 2014). The author suggested that party affiliation is a deep-rooted identity; therefore, any inconsistencies in the form of actions or beliefs against the party will result in dissonance and can be problematic for the individual (Vraga, 2014). This is an interesting concept presented as it indicates that due to individuals' deep affiliation with their political parties, they may need to present themselves consistently with their party's beliefs and values on social media. This can influence their self-presentation strategies and potentially lead to a portrayal that aligns directly with their party's ideals. The findings showed that Republicans experienced more dissonance and a more vital need for congruent political information than Democrats. The Democrats showcased different responses, experiencing less dissonance (Vraga, 2014).

A significant drawback of this study was the use of an only-student sample. Vraga (2014) highlighted how students tend to be more “malleable” in their political beliefs, implying that their political attitudes may not be as firmly established (Vraga, 2014). This flexibility in their beliefs might have influenced how individuals responded to the essay-writing task. Consequently, the findings may not universally apply to older and more mature populations.

When primarily focusing on the study's political implications, valuable insights regarding how cognitive dissonance influences perceptions in non-political contexts may be overlooked. Lastly, the study’s inherent limitations restricted its ability to conduct a more thorough investigation and draw definitive conclusions.

Bracket-Bojmel et al.’s (2015) study investigated the connections between individuals' motivations for self-presentation, their online activities on Facebook, and the feedback they received, such as likes and comments. The research used users’ last three Facebook status updates; their sample consisted of 156 undergraduate students (Bracket-Bojmel et al., 2015). They found that individuals motivated by performance goals tended to adopt enhancement motives and participate in self-promotion (Bracket-Bojmel et al., 2015). Individuals posted online to receive acceptance and promote an idealized version of themselves. They also identified that for optimal audience reactions, individuals were willing to participate in derogation, belittling or criticizing someone online to reduce their self-worth and reputation (Bracket-Bojmel et al., 2015). These findings indicated that individuals use online platforms as an outlet to feed their self-esteem. A three-step model was mentioned within the study, in which the researchers compare motivation and behaviours and how they affect the audience (Bracket-Bojmel et al., 2015). However, a limitation was that the meaning behind the audience’s feedback was not clearly described. The article mentions “liking”; however, we could not entirely assess how or what the concept of a “like" means on Facebook (Bracket-Bojmel et al., 2015). For example, is it equivalent to liking something in the real world? Or is it simply a gesture of respect?

Bargh & Fitzsimons (2002) conducted a research study showcasing the importance of consequences associated with self-expression when establishing liking, rapport, and bonds to gain understanding with other people. This study involved three experiments labelled experiment 1, experiment 2, and experiment 3. The initial study conducted a detailed investigation into how an individual's true self-concept becomes more readily accessible and engaged during online interactions with a new acquaintance (Bargh & Fitzsimons, 2002). After a filler task, the participants were paired up with another participant, in which they either interacted through an online platform or face-to-face in a lab room (Bargh & Fitzsimons, 2002). This interaction was either 5 or 15 minutes; the varying time lengths were meant to assess how the quantitative differences in the length of conversation can influence the quality of communication between the internet or face-to-face conditions (Bargh & Fitzsimons, 2002). Experiment 2 was very similar to Experiment 1, except the time participants interacted was not varied, no interaction took place, and lastly, a control group was added of participants who were unaware of any subsequent interaction (Bargh & Fitzsimons, 2002). Finally, in experiment 3, the researchers tested the hypothesis that suggested that individuals would better express their true selves online and be accepted by their interaction partner than participants who had face-to-face interactions (Bargh & Fitzsimons, 2002). Results indicated that

participants were more likely to project their ideal qualities in a partner on those they initially met and liked over the Internet (Bargh & Fitzsimons, 2002).

In addition, results suggested a significant correlation between liking and the extent to which an individual's description of an ideal close friend matches their description of an ideal partner over the internet. However, no correlation was found between such measures for individuals participants met and interacted with face-to-face (Bargh & Fitzsimons, 2002). These findings played a significant role in our research. Individuals may be more inclined to present themselves in an idealized manner when initiating interactions on the Internet, particularly when they initially like the person. This was vital for understanding the dynamics of self-presentation on social media, as it implied that people might be motivated to craft an online persona that aligns with their perceived ideal qualities, especially when there is initial attraction or interest. While there lacks a correlation between liking and the projections of ideal attributes in face-to-face interactions, this implies that social media plays a unique role in self-presentation and perceptions, allowing individuals to put out their ideal qualities that may not be replicated in face-to-face encounters. The distinct dynamics between online and face-to-face interactions further highlighted the platform-specific aspects of these effects.

Mun & Kim (2021) investigated what motivates individuals to rely on lying self-presentation on various social media platforms, such as Instagram, and explored the potential consequences of such actions. Lying culture exists as individuals present themselves in an idealized way to be accepted and validated online. People tend to lie regarding physical features, age, background and interests (Mun & Kim, 2021). The study highlighted the motivators behind lying online, such as the need for approval and impression management. This produced outcomes like depression, perceived popularity and individuals taking part in deleting behaviour on Instagram (Mun & Kim, 2021). This research was conducted through online surveys with 215 participants aged 20 to 39 in Korea. A quota sampling method was utilized to create a sample targeting Instagram users. The results illustrated that individuals who reported higher levels of lying in their self-presentation on social media have a strong need for approval (Mun & Kim, 2021). As a result, this had a positive impact on depression, perceived popularity, and deleting behavior among this group of people (Mun & Kim, 2021). Interestingly, although lying, self-presentation, and depression are correlated, perceived popularity appears to act as a mental defence mechanism against depression, nearly neutralizing its negative effects (Mun & Kim, 2021).

The findings revealed Individuals with a pronounced desire for approval tend to exhibit elevated levels of dishonesty in their self-representation, indicating that social media platforms can incentivize specific individuals to present themselves in a more favourable or socially acceptable manner (Mun & Kim, 2021). This was crucial for understanding the effects of social media on self-presentation, as it highlighted how the need for approval can influence the authenticity of self-representation. Within this study, a limitation was the significance of recognizing functions such as online profiles, posting pictures and comments, liking content, and leaving comments, and how they are employed for deceptive self-presentation on social network services (SNS) (Mun & Kim, 2021). SNS providers have the capability to strategically assign extra technical resources to specific areas where deceptive self-presentation behaviors are prevalent (Mun & Kim, 2021).

Zhang & Pan (2023) examined factors influencing individuals' behaviours on pan-entertainment mobile live broadcasted platforms. It showed how users' discontinuous usage is influenced by cognitive dissonance and self-efficacy (Zhang & Pan, 2023). The methodology of this study consisted of a two-part questionnaire, resulting in 425 samples (Zhang & Pan, 2023). From these responses, 340 valid results of the research indicated that excessive information, overwhelming number of services, and user addiction can lead to adverse and distressing emotions towards social media, ultimately influencing how users intend to utilize it (Zhang & Pan, 2023). Self-efficacy showed moderate cognitive dissonance, as increased confidence and self-assurance allow individuals to challenge their negative feelings (Zhang & Pan, 2023). The study's outcomes highlighted the critical role of excessive information, overwhelming number of services, and user addiction in generating negative emotions toward social media, which, in turn, can shape self-presentation dynamics (Zhang & Pan, 2023). When individuals experience negative feelings due to social media use, they may adapt their online personas to address or mitigate these emotions, influencing their digital identities (Zhang & Pan, 2023). These findings are especially relevant as they indicated that negative emotions can deter users from engaging with social media, potentially leading to adjustments in how they present themselves online. Users may opt for more selective or comfort-mitigating self-presentation strategies in response to these emotions.

A limitation mentioned was that other potential factors not examined in this study could impact discontinuous usage intentions (Zhang & Pan, 2023). Future research can analyze how these factors affect cognitive dissonance and self-efficacy (Zhang & Pan, 2023). The methodology of this study involved using a cross-sectional survey design, relying on a single source of data. This approach is limited in its ability to determine or analyze changes in usage over time (Zhang & Pan, 2023). The study suggested using a longitudinal research design to gain more insight (Zhang & Pan, 2023). Another limitation mentioned was the need for more generalizability, as the participants of this sample solely comprised the Chinese population (Zhang & Pan, 2023).

How we interact with others (online and in-person)

As we progressed in our research, the second most frequently recurring theme we encountered pertains to the examination of how both our personal and others' social media presences influence our interactions, whether in the digital sphere or through face-to-face encounters. The research gathered here explored the interplay between self-presentations of others on social media platforms and the welfare of viewers' (Fan et al., 2019); in contrast, we also delved into how users' presence and engagement on social media can affect their well-being (Jeong et al., 2019) and the determinants that prompt individuals to participate in self-disclosure or self-representation on social media platforms (Schlosser, 2020).

Fan et al., (2019) researched how sharing behaviour online, specifically others' self-presentations, through social media platforms impacts viewers' subjective well-being. Self-disclosure involves self-presentation, where individuals convey their identities through both verbal and non-verbal methods to project a specific image of themselves (Fan et al., 2019). The study mentioned that this act is a "conscious process" intended to control impressions in which individuals establish, alter, or maintain a specific image of themselves in front of others (Fan et al., 2019). The research was conducted in a

laboratory setting using 120 undergraduate students (Fan et al., 2019). Participants were from a university in Shanghai, China and were randomly divided into two groups of 60, comprising 72% females and 28% males (Fan et al., 2019). In the first group of participants, there was a clear relationship between both self-presentation and subjective well-being. Fan et al. (2019) discovered that viewing others' self-presentations on social media can lead to increased feelings of relative deprivation and decreased subjective well-being of the viewer. This is because of the tendency for people to make upward social comparisons. However, the negative impact can be lessened by an individual's general self-efficacy. The study suggests that individuals who engage in self-presentation on social media may experience adverse effects on their well-being. These effects can influence how they perceive others online. Those struggling with feelings of relative deprivation and reduced well-being may project these sentiments onto others, potentially leading to more critical or envious perceptions. Social media platforms commonly cultivate a comparison climate where individuals present their idealized selves. This revelation underscored the likelihood that this comparative context may influence how others are perceived. Suppose individuals sense that their well-being suffers due to self-presentation; they may be more inclined to perceive others as more accomplished, content, or cheerful, contributing to a distorted view of others on social media.

Some limitations within this research included the respondents were solely from China, while the research topic on social media and self-presentation mainly originated in Western research (Fan et al., 2019). Secondly, respondents were young adults who relied on social media for interpersonal communication. Thus, the results are not generalizable to the population. Next, this study heavily investigated one specific app, WeChat, a popular communication app in China, limiting the full scope of how individuals interact on other platforms such as Facebook, Twitter, Google+, and Pinterest (Fan et al., 2019). The results were acquired through self-reported data, indicating that the results are subject to common variance. As the sample was undergraduate students at a business school, demographic factors, like age and gender, may negatively impact the results. Lastly, researchers conducting this study manipulated others' self-presentation to elicit responses from participants, resulting in a loss of integrity (Fan et al., 2019).

Dutot (2020) explored the correlation between dependency on social media and the impacts on life satisfaction. This article delved into social media's 'dark side,' specifically social media addictions, fear of missing out, and narcissism on self-esteem. This study used quantitative methods through a self-reported survey with 260 participants (Dutot, 2020). The results of this study indicated that fear of missing out acts as a negative inhibitor of self-esteem, resulting in dissatisfaction in one's life (Dutot, 2020). A fear of missing out was seen to have a more substantial impact on women's self-esteem, while men were more likely to be dissatisfied with their lives.

Similarly, social media addiction was concluded to be more of a feminine phenomenon than a masculine phenomenon (Dutot, 2020). Moreover, no link was found between addiction and self-esteem; the more individuals spent time online, the better the life satisfaction for that group was (Dutot, 2020). Narcissism and self-esteem also did not correlate, as individuals seek validation from their group rather than others online (Dutot, 2020). The observation that social media addiction appears to be more prevalent among women than men was a significant finding. It implied that gender-related factors could affect how individuals engage with social media and perceive others. Equally important

was the absence of a link between addiction and self-esteem, suggesting that the time spent online might not necessarily harm self-esteem. A similarly significant finding was the lack of correlation between narcissism and self-esteem. This implied that, on social media, individuals seek validation primarily from their groups rather than relying on external sources for validation. This insight held implications for understanding how individuals perceive and interact with others on social media, where group dynamics and validation assume a pivotal role. A limitation observed in this study included self-reporting bias. Participants may alter their answers when doing the survey to cater their social media usage to the researchers' expectations to avoid feeling judged (Dutot, 2020). In addition, self-esteem was measured as a concrete variable; however, it failed to acknowledge that this trait varies with time and stages in life. Thus, evaluating the impacts on self-esteem needs to be done through a longitudinal study to identify fundamental changes (Dutot, 2020).

Jeong et al., (2019) investigated how social media presence and participation can impact users' well-being. Social media platforms contain opposing views and conflicting perspectives, increasing the likelihood of users experiencing cognitive dissonance (Jeong et al., 2019). The methodology used for this study was a questionnaire with 425 participants, in which users reported having an uncomfortable psychological state due to the increased exposure to heterogeneous opinions (Jeong et al., 2019). Cognitive dissonance theory suggests that individuals engage in strategic acts to relieve discomfort and uneasiness (Jeong et al., 2019). They may choose to share selective information, unfollow people who hold opposing views, skip posts of dissimilar views or limit interactions with certain people (Jeong et al., 2019). A limitation mentioned was that Facebook was the only platform used for this study, therefore questioning its generalizability to other platforms and users (Jeong et al., 2019). For future research, it was recommended that other platforms be studied to understand further how constant exposure to information and dissimilar opinions can affect the psychological states and behaviours of others (Jeong et al., 2019). There should be a focus on additional control variables which can cause cognitive dissonance among social media users, such as political or social views (Jeong et al., 2019). It would also be beneficial to examine the consequences of increased availability of fake news or false information (Jeong et al., 2019).

Schlosser (2020) examined which factors influence an individual's self-disclosure or self-presentation within social media platforms. The study highlighted five distinct characteristics of online and in-person communication, "anonymity, reduced information richness, asynchronicity, multiple audiences, and audience feedback" (Schlosser, 2020). This review found that anonymity is not conducive to just one, as online platforms provide a private sphere where individuals can freely express themselves and a space to conceal their identity (Schlosser, 2020). Asynchronicity provided more significant opportunities for self-presentation due to the controlled nature of online communication, allowing users to easily present an idealized version of themselves (Schlosser, 2020). Social media has multiple audiences with opposing views, making it challenging to keep a particular impression. This can push individuals to avoid discussing social or other heated discussions to remain neutral within these populations (Schlosser, 2020). Users maintained their impression by acting per the expectations of the group they were interacting with (Schlosser, 2020). Notably, anonymity on digital platforms does not

merely confine self-expression; instead, it indicates that individuals can navigate a delicate equilibrium between freely expressing themselves and concealing their identity. This dual nature of online spaces was fundamental in comprehending how people construct their personas on social media.

Additionally, the acknowledgement of asynchronicity in online communication as a conduit for controlled self-presentation holds significance. It highlighted how individuals can adeptly fashion idealized versions of themselves digitally, potentially influencing how they are perceived. In essence, social media platforms serve as spaces where individuals can curate and highlight the most favourable facets of their identity, thus potentially shaping others' perceptions of them (Schlosser, 2020). Furthermore, the study highlighted the complexity of managing one's digital identity when confronted with diverse audiences holding opposing views. This complexity often led individuals to adopt a more neutral or non-confrontational stance to maintain a coherent online image (Schlosser, 2020). Moreover, the findings stressed the paramount role of group dynamics in shaping online impressions. Users frequently conform their behaviour to align with the expectations of the online groups they engage with, implying that others' perceptions can be substantially influenced by the norms and values prevalent within these virtual communities (Schlosser, 2020). Further research is needed to investigate additional factors influencing self-disclosure and self-presentation within online spheres (Schlosser, 2020).

Most research did not consider how age and generational factors influence identity formations, as most samples did not consist of older adults. Each age group, teenagers, and seniors presented themselves differently in person and online due to different stages of identity formation and understanding social situations. Research should investigate how social media can impact users at different stages of life to gain further insight into how self-presentation can impact their self-identity. Most of the research focused on short-term impacts; however, there was a growing need for longitudinal studies to examine how maintaining an idealized persona online for several years can positively or negatively impact an individual’s self-identity and relationships. Future research must consider the ethical implications of false self-presentation within online platforms and how individuals perceive and navigate through these fabricated identities.

Theoretical Frameworks

Dramaturgy

Erving Goffman's (1959) dramaturgical framework parallels everyday social interactions and the theatre. This sociological lens analyzes human nature within their social worlds (Goffman, 1959). Goffman (1959) describes individuals as actors with performative roles within their social interactions. Through impression management, individuals create, portray, and maintain a particular perception in front of their audience (Goffman, 1959). They may use settings, scripts, nonverbal communication, costumes, and other props to help reinforce their image (Goffman, 1959). The actor may play various roles within their social world, each a mirror to the expectations within their audience. This is a conscious or unconscious effort to be socially liked or accepted based on societal norms or expectations (Goffman, 1959).

Goffman (1959) uses the front and backstage to explain how individuals switch roles depending on the situation. The front stage is where individuals are in front of an audience, referring to the public or the people the individual is performing for (Goffman,

1959). While in front of an audience, the actor engages in impression management, continuing to act and behave following their role and the expectations of that group (Goffman, 1959). Societal expectations and norms make up the script, which guides an actor's actions and behaviours when engaging in social settings. These patterns are socially acceptable and provide individuals with a structured strategy to rely on (Goffman, 1959). Backstage, they are no longer required to display an idealized version of themselves; instead, they can engage with their private and authentic self (Goffman, 1959).

In addition, Goffman (1972) refers to an individual's self-image in the audience's eyes as "face." He explains that to maintain or enhance their image, individuals must engage appropriately and acceptably to maintain or enhance their image and perception (Goffman, 1972). Actors strategically choose an image that reflects highly favoured traits to build connections and rapport with others, such as polite, professional, empathetic, trendy or intellectual (Goffman, 1972). An individual may choose to uphold a "positive face," indicating their desire to be liked, admired, and accepted by others, or a "negative face," denoting their preference for autonomy, independence and freedom (Goffman, 1972).

Another concept within this framework is civil inattention, which refers to individuals acknowledging each other's presence while maintaining personal boundaries and privacy in a public setting (Goffman, 1959). This allows them to avoid invading each other's space and attracting or giving unwanted attention. These interactions include subtleties such as brief eye contact, a nod, or gesturing "hello" from afar (Goffman, 1959). This unspoken norm maintains the balance of social practices and decorum when engaging in shared spaces (Goffman, 1959).

Furthermore, Goffman (1959) explains interaction rituals, suggesting that all social interactions are predictable due to predetermined expectations and patterns. This allows for social cohesion, order and understanding among members of society as they can navigate social situations more efficiently (Goffman, 1959). Goffman (1959) also addressed the stigma surrounding individuals who deviate from societal norms and expectations. These individuals are subjected to social rejection, discrimination, and disapproval from others (Goffman, 1959). Our study used a dramaturgical framework to analyze how individuals engage in impression management techniques on social media— focusing on how selective sharing, filtering, and false presentation in online interactions shape self-perceptions and the perception of others. Individuals are actors on social media, presenting content to gain approval and acceptance from their audience. Individuals find validation through their number of followers, likes, comments, and shares, exemplifying how actors maintain a positive face within such platforms. Selective sharing allows them to filter their content, attempting to conceal their true identities backstage.

Cognitive Dissonance

Cognitive dissonance theory is a classical theory in cognitive psychology proposed by American social psychologist Festinger in 1957 (Festinger, 1957). This theory, based on Gestalt psychology, looks at the psychological phenomenon of cognitive dissonance, which occurs when a person holds conflicting beliefs or attitudes, leading to a sense of discomfort (Festinger, 1957). It suggests cognitive and behavioural inconsistencies produce dissonance (Festinger, 1957). Individuals tend to cope with this discomfort by

engaging in “discrepancy reduction,” which assists them in achieving cognitive consistency (Festinger, 1957). Three general methods of discrepancy reduction include the altering of pre-existing beliefs, the adding of new beliefs, or reducing the importance of existing beliefs (Festinger, 1957). Cognitive dissonance is the mental discomfort that occurs when beliefs, values, or attitudes conflict (Festinger, 1957).

Cognitive dissonance theory was related to our study due to the psychological conflict of self-presentation, confirmation bias, and social comparison. Many people choose only to share the highlights of their lives on social media, which can cause shame or dissonance when their daily lives do not match what they share on social media. This can lead to dissonance between their online and offline identities, causing them to use discrepancy reduction methods.

Additionally, individuals tend to interact with information and groups in which their ideas and values align. Seeing conflicting arguments on social media may cause a sense of dissonance within individuals, resulting in changes in the perception of those making/ sharing these arguments. Lastly, seeing others share their accomplishments, bodies, relationships, and overall life highlights can lead to cognitive dissonance and make individuals feel insecure or inferior, leading to confusion and making individuals uncomfortable with their reality and what they see online since they struggle to process it accurately. Our study used cognitive dissonance to explore selective sharing, conflicting beliefs/ values in online interactions, and social comparison. Our questions allowed us to understand further participants' views on themselves, others and social media and analyze the impacts of social media on our self-presentation, perceptions, and the perception of others.

Optimal Distinctiveness Theory

Optimal distinctiveness theory is a social psychological theory coined by Marilyn Brewer (Brewer, 2007). The theory states that humans will choose social identities to satisfy two needs: the desire for group affiliation and personal distinctiveness (Brewer, 2007). Individuals define themselves differently depending on their social groups (Brewer, 2007). They do this to have a sense of belonging and avoid social isolation, but they still want to stand out within that group (Brewer, 2007). When individuals want to feel included in a particular group, their self-concept alters to fit that group (Brewer, 2007). Sometimes, an individual may switch from one group to another that feels more fitting (Brewer, 2007).

Self-stereotyping is one way an individual may act to feel like they fit into a group, leading to adjusting behaviours and actions to align with the norms and expectations of the group (Brewer, 2007). To those who may belong to a stigmatized or disadvantaged group, correlating to that group may lower self-esteem; however, having a solid group identity can help to improve an individual’s self-esteem (Brewer, 2007). People also strive to maintain group distinctiveness, sometimes excluding others to enhance the group members’ feelings of inclusion (Brewer, 2007). Newer group members are more likely to conform to the overall group in fear of rejection (Brewer, 2007).

In our study, applying optimal distinctiveness theory has helped us understand the mechanisms surrounding the construction of online personas to garner social desirability (e.g., by following trends) while appearing unique. In this sense, individuals want to have a sense of belonging within online communities to avoid social exclusion. However, they will strive to maintain a distinct identity rather than blend in too much. There are many

subgroups online that individuals identify with, and they may behave in specific ways to show that they belong to that group.

Self-Verification Theory

William Swann's self-verification theory states that individuals seek consistency between how they perceive themselves and how they wish to be perceived by others (Swann, 2007). For example, if individuals view themselves as highly intelligent, they will strive for others to see them that way (Swann, 2007). Individuals strive to maintain this image of themselves in their minds and will act in ways that maintain it (Swann, 2007). With this, individuals also strive to hear affirmative feedback that aligns with their self-image (Swann, 2007). Individuals may use identity cues so that others can see them in a self-verifying manner (Swann, 2007). For example, individuals may dress a certain way to signal affiliation with a particular group (Swann, 2007). Despite the pursuit of a stable self-view, changes in self-perception can still occur, often during significant life changes (e.g., growing up, changing careers, etc.) or when an individual decides to change (Swann, 2007).

Concerning our research, self-verification theory can help us understand individuals' desire for a stable self-concept, particularly online. For instance, individuals who perceive themselves as attractive want others to share this view, often reflected in their social media profiles. Individuals may also categorize themselves to align with a particular group online to control others' perceptions of them. This could be done by following trends or withholding certain aspects of their identity in fear of judgment. By doing this, however, the individual constrains individual expression, hindering authenticity.

Methodology

Growing up surrounded by social media and seeing and experiencing its impacts on ourselves and our peers, we decided to investigate the impacts of social media on self-presentation, self-perceptions and perceptions of others. Our overarching research questions were: What impact, if any, does social media have on how individuals present themselves? What impact, if any, does social media have on our perceptions of others? Our findings will be understood using the theories of optimal distinctiveness (Brewer, 2007), dramaturgy (Goffman, 1959), self-verification theory (Swann, 2007) and cognitive dissonance (Festinger, 1957). In the present study, we conducted quantitative and qualitative research to assess the relationships between social media, perceptions of others, self-perceptions, and self-presentation. Using a cross-sectional design, the study utilized an anonymous survey to collect data and assess our research questions. The survey was conducted on LimeSurvey, the McMaster Research Ethics Board (MREB) approved platform for anonymous online surveys. The questionnaire asked participants to complete six demographic questions and 20 questions for data analysis (see Appendix A). We looked for information on self-perceptions, self-esteem, pressure to curate idealized images, and the impact of social media on various aspects of life. Four questions were open-ended short answers, four were closed-end short answers on ethnicity, gender identity, sexual identity, and place of birth and 18 were multiple choice. Using both methods, we gathered semi-generalizable data on our desired population and in-depth information about participants' experiences with social media. In the later stage of data analysis, Jamovi and Microsoft Excel were used to interpret our results through statistical

analysis and coding of qualitative data. This section will outline our research process, ethical considerations, foreseeable challenges, plans for data analysis and our research process timeline. The research was approved by the McMaster Research Ethics Board (MREB#: 0327) (Appendix B). Our research did not pose participants more risk than what is experienced in their day-to-day lives.

Procedure

The research process began in September 2023 and ended in late March 2024. We created our research team in early September and generated research questions relevant to perceptions of others, self-perceptions, and self-presentation. During September, our team met weekly to brainstorm theories and present ideas, research methods, and previous literature related to our areas of interest. Although a wide variety of literature exists on social media and its impacts on individuals, we found that literature on the impact of social media on our perceptions of others needed to be expanded. With this gap, the team saw an opportunity to contribute to the literature on social media and its impacts on individual's perceptions of others, self-perceptions, and self-presentation. From here, we created open-ended (qualitative data) and closed-ended (quantitative data) questions for our survey (Appendix A). Questions in the survey were constructed to help us gain insight into student experiences and opinions surrounding social media and self-presentation, as well as self-perceptions and perceptions of others as influenced by social media. We created our online anonymous survey on LimeSurvey, a platform approved by the McMaster Ethics Research Board. We received ethics approval on November 8th, 2023, and our survey went live on November 9th, 2023. Once the survey was live, we began our recruitment process. At this stage, we contacted various groups, clubs, and societies at McMaster – see Appendix C – to ask them to advertise our survey on social media or by email using our letter of information (Appendix D) and approved recruitment scripts (Appendix E, Appendix F, and Appendix G). These groups, clubs, and societies may also have been sent any of the following media: a physical poster (Appendix H), a social media story (Appendix I) and a post for social media (Appendix J). On January 22nd, 2024, we submitted a Change Request Form (Appendix K) to contact more MSU groups, clubs, and societies. Our participants were McMaster undergraduate students at least 18 years of age in any program which encountered our survey link. Participants completed the study in any location before the survey closed on February 16th, 2024, at 11:59 p.m. When participants accessed the survey link, they first viewed the letter of information (Appendix D), which contained information about the study, risks, benefits, and resources for the Student Wellness Center (Appendix L). After reading the letter of information (Appendix D) and providing us with their implied consent by clicking "Yes, I agree to participate in this study," participants gained access to survey questions. Participants then could work through the survey questions, not having to answer all questions if they did not feel comfortable and pressed submit upon reaching the end. Data was collected using LimeSurvey. Our survey was active from November 9th, 2023, until February 16th, 2024.

Ethical Considerations

Ethical considerations are crucial throughout the research process. Before commencing any research involving participants, we took the necessary steps to identify, assess, and eliminate any potential risks that could be avoided. This included a thorough review of our research protocols, participant safety measures, and ethical considerations to ensure the well-being of all those involved. First, we ensured that all participant data collected was anonymous and confidential. All data gathered from participants was stored on password-protected devices, communication about results and data remained within closed quarters, and participants remained anonymous at every point of the process. Upon the conclusion of our research, all stored participant data was deleted on April 30th, 2024. Our research did not present risks exceeding those typically encountered in daily life.

After considering anonymity and confidentiality, psychological and social risks existed in the study. Due to our research topic, participants were required to self-reflect on topics such as self-esteem, self-perceptions, and how they perceive others. This could cause psychological distress to participants by invoking unpleasant feelings, memories, or negative thoughts. With this in mind, we generated our survey questions to be as low-risk as possible. Although we did not expect our questions to cause participants psychological distress, there is always a risk. Psychological risks associated with our research were worth considering during the process, as they may have violated ethics protocols, skewed our data, or caused a reduction in participant response rates. These may all have taken away from the integrity of the study. If our questions were too personal for participants, they could have been reluctant to respond, resulting in holes in our data set and conclusions. Considering this, we developed our questions to not expose participants to more risk than what is experienced in their day-to-day lives. Our questions only asked what was required for data analysis. We also reminded participants that they could stop the survey at any time if they felt uncomfortable during the process. They had zero obligation to complete the survey once they began. Participants could also skip any question they did not wish to answer. Most of the questions skipped were demographic questions, particularly the question asking what their sexual orientation was, and the short answer open-ended questions. All other questions had almost perfect response rates. Lastly, in our letter of information and the final page of the survey, we provided support resources for the Student Wellness Centre (Appendix K).

Furthering our discussion on ethical considerations, a social risk existed in which there was a possibility of comprising participant anonymity due to the survey format. As participants could complete the survey in any location of their choosing, it could have resulted in the survey being completed in a public place where those in close physical proximity may have observed answers. To negate this risk, while participants could complete the survey at a time and place of their choosing, we encouraged them to do it in a private place where others could not see them completing the survey or their answers. During recruitment, participants were informed not to interact with any postings or respond to any email regarding the survey, which may have compromised their anonymity.

We, as researchers, were also at the time McMaster students, adding an additional ethical consideration: conflict of interest. At the beginning of our research, in our ethics application, all researchers indicated a conflict of interest with participants, as they were our peers. One group member also indicated two other conflicts of interest, being a

member of the club COPE: A Student Mental Health Initiative and having family attending McMaster in the undergraduate student population. In January 2024, a new conflict of interest arose as one group member became a TA within the Social Psychology Program. To mitigate these conflicts, group members were assigned to contact particular MSU groups, societies, and clubs where they had no specific conflict. This was done to reduce the risk that anyone associated with the research team would impact the study. In addition to conflicts of interest, each student researcher had something to gain from this interest. Aside from gaining knowledge and insight, we also completed a mandatory program requirement at the conclusion of our research. With this, we each had an additional conflict of interest and had to be cautious not to manipulate data to support our research questions or hypotheses. Conflicts of interest reminded us as researchers to remain objective and impartial throughout our research process. These points conclude our ethical considerations, bringing us to foreseeable challenges in our research.

Foreseeable Challenges

This section identifies foreseeable challenges in our research and the steps taken to ensure our research remains valid and reliable. Our study was conducted through participant self-reporting, which can cause numerous issues in our research's data collection and analysis phases. Individuals often portray themselves more favourably, potentially overreporting positive behaviours and experiences while downplaying negative ones, referring to the social disability bias. This bias has the potential to skew research results significantly, presenting a misleading depiction of how individuals utilize and are influenced by social media. This is consistent in previous literature; for instance, a study done by Neuberger (2016) explored the duration individuals dedicated to seeking information online and whether individuals exaggerate information-seeking activities. A challenge observed in this study was social desirability bias, as it held the power to influence results significantly through inaccuracies in the data. Since the study was a self-reported survey, individuals may have answered based on how they wanted to be perceived rather than by inputting accurate information that reflects their online habits (Neuberger, 2016).

Addressing this challenge required the implementation of strategies that minimize the chances of social desirability bias. Strategies included ensuring anonymity and confidentiality in data collection, while also employing careful questioning techniques and multiple data sources. This approach reduced the likelihood of individuals providing false information, thereby enhancing the reliability and validity of the survey data. This precautionary measure was taken to maintain the research findings' integrity and minimize the impact of biases on participant responses.

Additionally, we used convenience sampling to recruit our participants, which can lead to sampling bias and limited diversity. Nielsen et al., (2017) shared that there is persistent sampling bias in developmental psychology, and our dependence on convenience sampling can limit the diversity in our samples. Most researchers collect data from WEIRD (Western, educated, industrialized, rich, and democratic) populations and our study was conducted at McMaster University, which also has a WEIRD population (Nielsen et al., 2017). Additionally, 95.5% of our participants were under 25, leaving only 4.5% of our participants to be over 25 years old. Therefore, we had limited input from anyone over 25, and our results could not be generalized to those over 25.

Researchers need to acknowledge this as a concern to avoid demographic-specific findings being generalized and misattributed to other individuals (Nielsen et al., 2017). Ultimately, this can lead to broader implications for the reliability of research and academia. To minimize any sampling bias, we reached out to a wide variety of groups on campus and ensured we had posters in every building so every student had a chance to see and potentially participate in our research. After completing our research, we made the demographic of our study very clear and reiterated that these findings might not be able to be generalized beyond our demographic.

Data Collection and Analysis

Data collection on LimeSurvey began on November 9th, 2023 and was completed on February 16th, 2024, at 11:59 pm. At that time, responses were exported from LimeSurvey into an OMV file to be imported into Jamovi. Analysis of quantitative results was conducted using the statistical software Jamovi. Qualitative results were exported from Jamovi into a Microsoft Excel chart for more accessible analysis and were coded using a thematic approach. The survey asked participants to complete six demographic questions and 20 questions for data analysis (Appendix A). Participants answered our closed-ended survey questions based on the answer choices provided for each question. These ranged from “Yes” and “No” to “I carefully curate and present an idealized version of myself.” Our open-ended qualitative questions allowed participants to give detailed insight into their experiences with social media. Four of our demographic questions, when asking about ethnic identity, sexual orientation, gender identity, and place of birth, were open-ended to allow participants not to be refined by the answer choices we provided and knowing we were drawing participants from a diverse population.

Timeline for Data Collection and Analysis

Task	Start Date	End Date
Proposal & Ethics Application	September 6th, 2023	Initial End Date: October 19th, 2023 Ethics Approved On: November 8th, 2023 Change amendment form submitted: January 22nd, 2024
Participant Recruitment	November 9th, 2023	February 16th, 2024, at 11:59 pm
Data Collection	November 9th, 2023	February 16th, 2024 at 11:59 pm
Data Analysis	February 17th, 2024	March 2024
Poster Creation	February 2024	Completed: March 4th, 2024 Date of Poster Presentation: March 20th, 2024
Final Paper	September 6th, 2023	March 28th, 2024

Data Deletion	————————	April 30th, 2024 (or when told to by Dr. Clancy)

Summary

In summary, we considered numerous factors in creating our research design and planning our research process. First was ethics, where we looked at numerous risks and found countermeasures to optimize our research the best we could, including looking at our conflicts of interest that may affect data collection and analysis. We also took into consideration challenges, such as participant social desirability bias. Throughout our research, we collected responses from 90 undergraduate students at McMaster University who were 18 or older. We began recruitment in November 2023 and concluded data collection on February 16th, 2024. Following data collection, we conducted statistical and thematic analyses of participant responses.

Results

We wanted to see if there were any gender differences related to the influence of social media on self-presentation, self-perceptions and perceptions of others. We had three hypotheses: social media will negatively affect how individuals present themselves. This negative effect will be stronger for females; social media will negatively affect how individuals perceive others. This effect will be less strong for males; females will post more on social media to portray a specific image to others. After data collection, we realized that how we based our survey questions on proving or disproving these would not be possible. Still, we will look specifically for gender differences across self-presentation, self-perceptions and perceptions of others. Our results are broken down into three main categories: Participant Demographics, Quantitative Results, and Qualitative Results. Participant Demographics examine participants' age, gender identity, sexual orientation and more. The section on quantitative results is further broken down into four sub-categories: results when accounting for gender identity variables, results regarding main research question one, results regarding main research question two, and results supporting both research questions. Qualitative Data is further broken down into themes from each of the four questions, with summary and direct quotations.

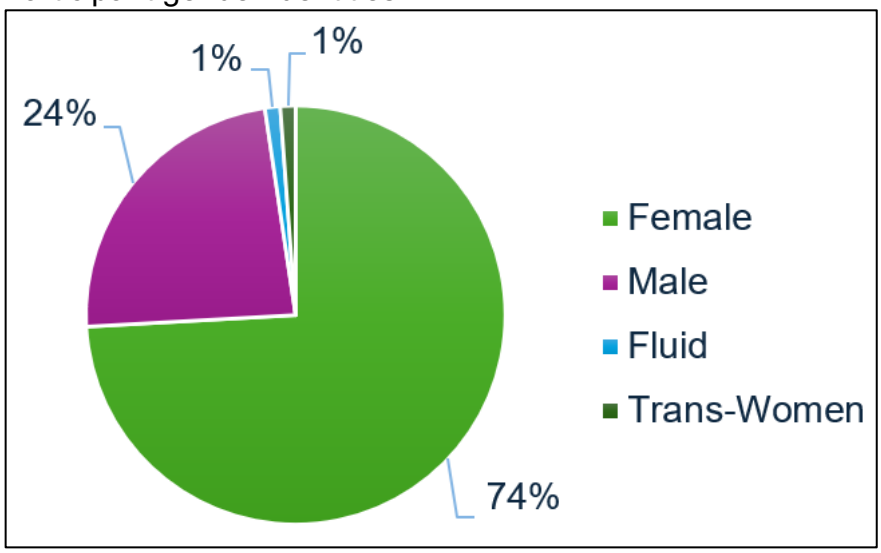
Participant Demographics

Data was collected from 334 participants. We removed participants who did not consent to participate (N = 244). After removing these participants, we analyzed the data of 90 undergraduate student participants. The mean age was 20.9, with a standard deviation of 1.50. As seen in Figure 1, most participants identified as female (n = 63), while 20 participants identified as male, one participant identified as gender fluid and one identified as a Trans-woman. For analysis, male, fluid, and trans-women have been combined into one category labelled "Male/Other gender identities."

Participants were asked to identify their sexual orientation or sexual identity; over three-quarters of participants identified as heterosexual (n = 60), eight identified as bisexual, three identified as gay or lesbian, two identified that they were questioning/unsure or preferred not to say. Two participants identified as asexual or queer

Figure 1

Participant gender identities



– see Figure 2. Figure 3 breaks down participants' current level at McMaster: 40.50% of participants were Level 4, 17.90% were Level 5 and Level 2, 13.1% were Level 1, and 10.7% of participants were Level 3.

When asked, “What is your place of birth?” we had 15 different response groupings combined into five larger groupings based on continental location. In Figure 4, it is shown that over half of the participants were born in North America (65.85%), 22.22% were born in Asia, 7.32% were born in Europe, and 1.22% were born in Africa or Oceania. We then asked about ethnic identity and 21 different identities were given, combined into larger groupings based on continental location. After doing so, as seen in Figure 5, almost half of the participants were of Asian descent (48.75%). In comparison, 33.75% of participants

Figure 2

Participant sexual orientations

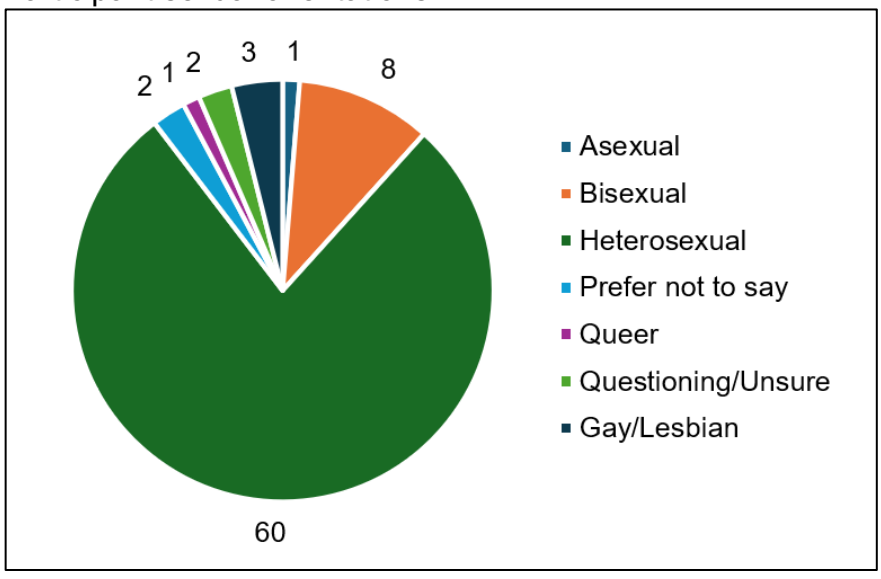
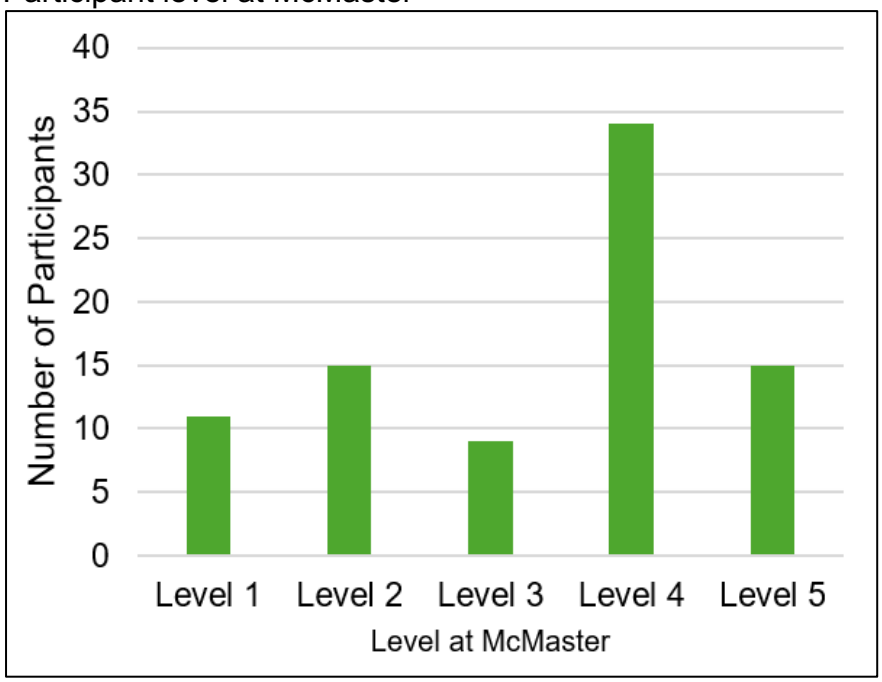


Figure 3

Participant level at McMaster



were European, 7.50% were African, 5% were ethnically mixed, and 5% identified as other ethnicities (Middle Eastern, Russian, Latinx/Hispanic).

Quantitative Results

Results Upon Accounting for Gender Identity Variable

In this section, all quantitative data questions, minus one, were analyzed against our

Figure 4

Participants place of birth

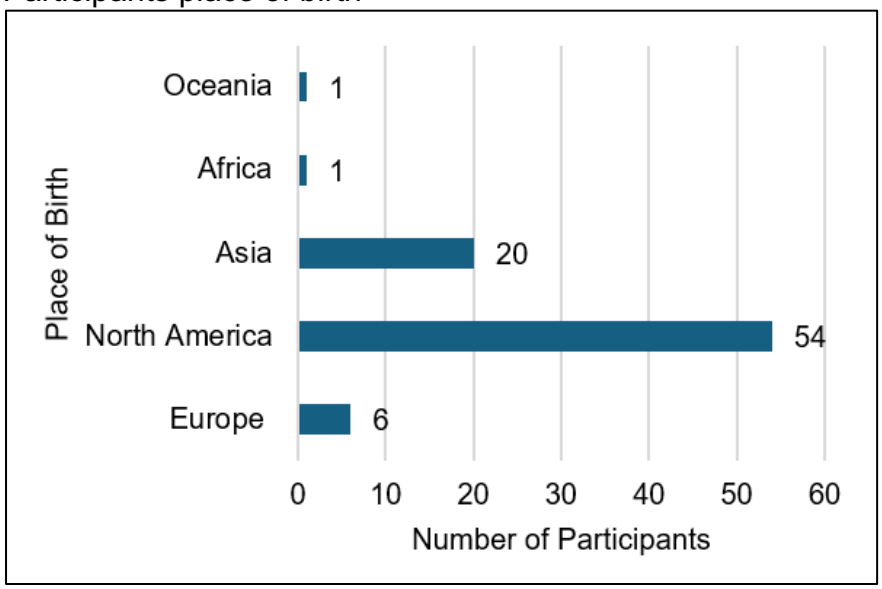
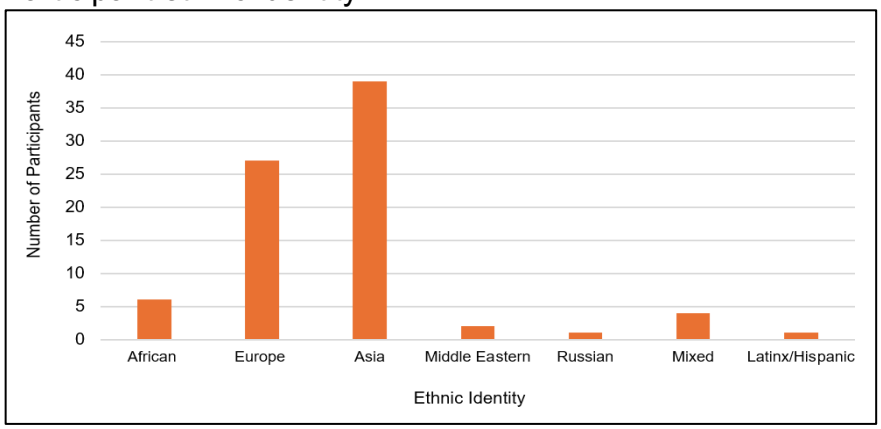


Figure 5

Participant ethnic identity



created gender identity variable.

When asked how frequently they use social media platforms to curate and present a particular image or identity to others, participant breakdown is the following: 11 (12.9%) said always, 8 (9.4%) said never, 22 (25.9%) said often, 16 (18.8%) said rarely, and 28 (32.9%) said sometimes. When responses were divided by gender, as seen in Figure 6, there was no statistical significance ($p > .05$). Meaning there were no gender differences in how often participants used social media as a platform to curate and present a particular image or identity of themselves to others, X^2 (4[df]) = 1.56, $p = .82$.

Table 1

Gender and how often participants used social media to curate and present a specific image or identity to others

	Gender Identity		
How often do you use social media platforms to curate and present a certain image or identity to others?	Female	Male/Other gender identities (% of Male/Other Identities or % of Total Participants)	Total
Always	7 (8.2%)	4 (4.7%)	11 (12.9%)
Never	6 (7.1%)	2 (2.4%)	8 (9.4%)
Often	18 (21.2%)	4 (4.7%)	22 (25.9%)
Rarely	11 (12.9%)	5 (5.9%)	16 (18.8%)
Sometimes	21 (24.7%)	7 (8.2%)	28 (32.9%)
Total	63 (74.1%)	22 (25.9%)	85 (100%)
All percentages shown are percent of total participants			

In response to question 2, “Do you feel pressured to maintain a certain image on social media due to societal expectations or peer influence?” Of the participants, 52 (61.2%) said yes, while 33 (38.8%) said no. As seen in Table 2, when responses to Question 2 were divided by gender, there was no difference in gender response, X^2 (1[df]) = 1.56, p = .21. The percentage of responses from both genders for each answer were close in proximity. There is no statistical significance (p > .05).

Table 2
Pressure to maintain a particular image on social media due to societal expectations or peer influence vs. Gender

	Gender		
Do you feel pressured to maintain a certain image on social media due to societal expectations or peer influence?	Female	Male/Other gender identities	Total
Yes	41 (48.2%)	11 (12.9%)	52 (61.2%)
No	22 (25.9%)	11 (12.9%)	33 (38.8%)
Total	63 (74.1%)	22 (25.9%)	85 (100%)
All percentages shown are percent of total participants			

Participants, when asked how they would describe the impact of social media on their self-esteem and self-perceptions, 25 (29.4%) said negatively, 52 (61.2%) were neutral, 8 (9.4%) answered they were unsure, and 2 (2.4%) said positively. When responses were broken down by gender identity, there was no statistical significance (p > .05). Table 3 shows both gender identities had equal impact from social media on their self-esteem and self-perceptions, X^2 (3[df]) = 6.47, p = .091.

Table 3
Gender vs. Impact of social media on participant self-esteem and self-perceptions

	Gender		
How would you describe the impact of social media on your self-esteem and self-perception?	Female	Male/Other gender identities	Total
Negative	20 (23.5%)	5 (5.9%)	25 (29.4%)
Neutral	40 (47.1%)	12 (14.1%)	52 (61.2%

Not too sure	2 (2.4%)	4 (4.7%)	8 (9.4%)
Positive	1 (1.2%)	1 (1.2%)	2 (2.4%)
Total	63 (74.1%)	22 (25.9%)	85 (100%)
All percentages shown are percent of total participants			

To gauge how much time participants spend on social media, they were asked to indicate from one of four choices (a few times a week, multiple times a day, once a day or rarely). In Figure 6, before accounting for the gender variable, 3 participants said a few times a week, 79 said multiple times a day, two said once a day, and one said rarely. After accounting for the gender identity variable, there was no gender identity difference in response; both gender categories had equal social media usage, X^2 (3[df]) = 6.47, p = .091. This finding was statistically insignificant ($p > .05$).

Participants were asked how they perceive their behaviour on social media in terms of self-presentation. Before accounting for gender, 32 (38.1%) of participants said they carefully curate and present an idealized version of themselves, 36 (42.9%) said they do not pay much attention to how they present themselves on social media, 10 (11.9%) said they share a mix of both positive and negative aspects of their life, and 6 (7.1%) responded other. After accounting for the gender identity variable (Table 4), the p-value was statistically insignificant ($p > .05$). Indicating there were no gender differences, female and male/other identities had similar perceptions of their behaviour on social media, X^2 (3[df]) = 4.13, p = .247.

In Figure 7, participants were asked how social media influences their self-esteem (n = 85). Accounting for gender identity resulted in statistical significance p = .04. Showing that female and male/other gender identities stated that social media affected their self-esteem differently, X^2 (3[df]) = 8.30, p = .04. Looking at participant response options, 24

Figure 6

Social Media Use Frequency Accounting for Gender Identity

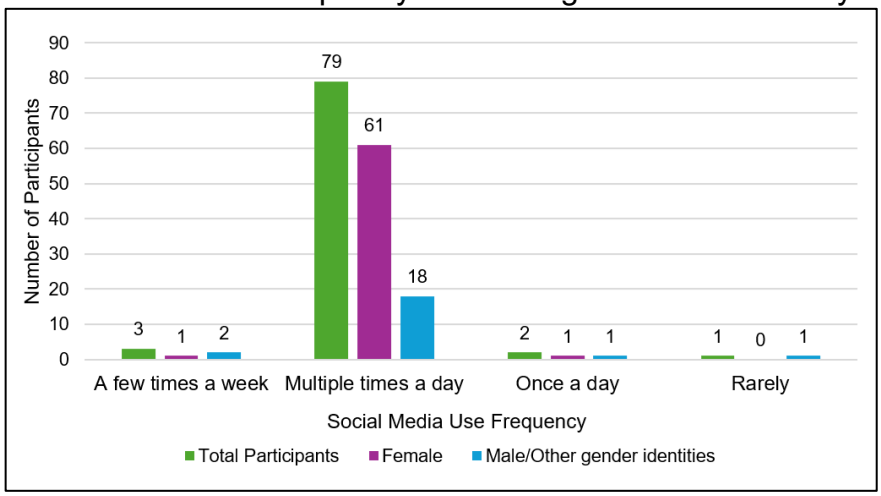
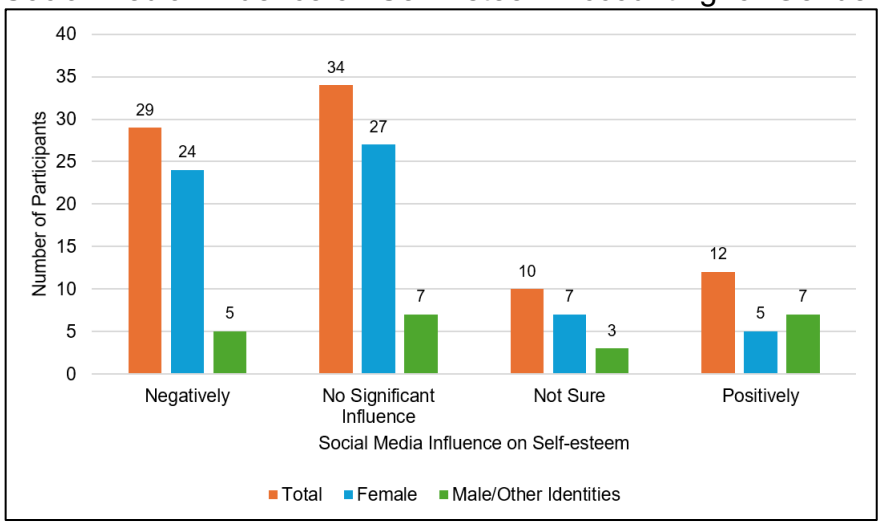


Table 4
Perceptions of own behaviour on social media in terms of self-presentation accounting for Gender Identity

	Gender		
How do you perceive your own behaviour on social media in terms of self-presentation?	Female	Male/Other gender identities	Total
I carefully curate and present an idealized version of myself.	26 (31%)	6 (7.1%)	32 (38.1%)
I don't pay much attention to how I present myself on social media.	24 (28.6%)	12 (14.3%)	36 (42.9%)
I share a mix of both positive and negative aspects of my life.	7 (8.3%)	3 (3.6%)	10 (11.9)
Other	6 (7.1%)	0 (0%)	6 (7.1%)
Total	63 (75%)	21 (25%)	84 (100%)
All percentages shown are percent of total participants			

(38%) of female participants indicated social media harmed their self-esteem compared to only 5 (22.7%) of male/other identity participants.

Figure 7
Social Media Influence on Self-Esteem Accounting for Gender Identity



Participants were asked if social media platforms should provide more tools and resources to promote authentic self-presentation. No significant association was found when breaking down responses by gender, X^2 (2[df]) = 2.54, p = .28. Question 11 of the survey was “Have you ever unfollowed or blocked someone on social media due to their self-presentation or content?” with response options as “No,” “Occasionally” and “Yes.” Before accounting for gender, 15 (17.6%) of participants said “No,” 6 (7.1%) said “Occasionally,” and 64 (75.3%) said “Yes.” This was a significant finding (p = .04). Indicating that there was a difference in response between females and males/other identities, X^2 (2[df]) = 6.67, p = .04. Figure 8 graphically shows the difference.

Participants were asked if they had ever taken a break from social media or considered it to reduce the pressure of self-presentation and its impact on their mental well-being. No significant association was found when breaking down responses by gender, X^2 (2[df]) = 1.20, p = .55. Participants were also asked to describe the overall influence of social media on their life in a closed-ended question. Answer choices included “A mix of positive and negative,” “Mostly negative,” “Mostly positive,” and “No significant influence.” When participant responses were broken down by gender, there were no differences in response types, X^2 (3[df]) = 4.41, p = .22. Question 16 of the survey asked, “Do you believe that social media has influenced your perceptions of other people's lives and relationships?”. Overall, 3 participants (3.5%) answered no, 3 (3.5%) responded that they were not sure, and 79 (92.9%) answered yes. After dividing participant responses by gender identity, Table 5 shows no gender difference in responses, X^2 (2[df]) = 3.66, p = .16.

Contrary to Question 16, Question 17 asked participants if they felt pressure to project specific images of their relationships and personal life on social media, Figure 9. There was no statistical significance or gender differences in responses, X^2 (2[df]) = 0.98, p =.61. Participants were also asked about how often they compare their own relationships

Figure 8

Unfollowing and Blocking Other Users on Social Media Due to Their Self-Presentation and Content Accounting for Gender Identity

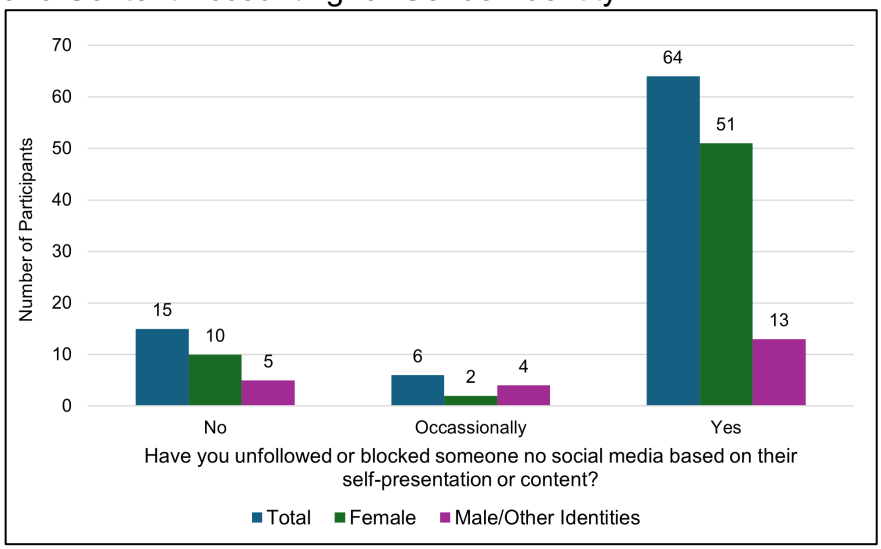


Table 5
Participants' gender and belief on whether social media has influenced their perceptions of other people's lives and relationships

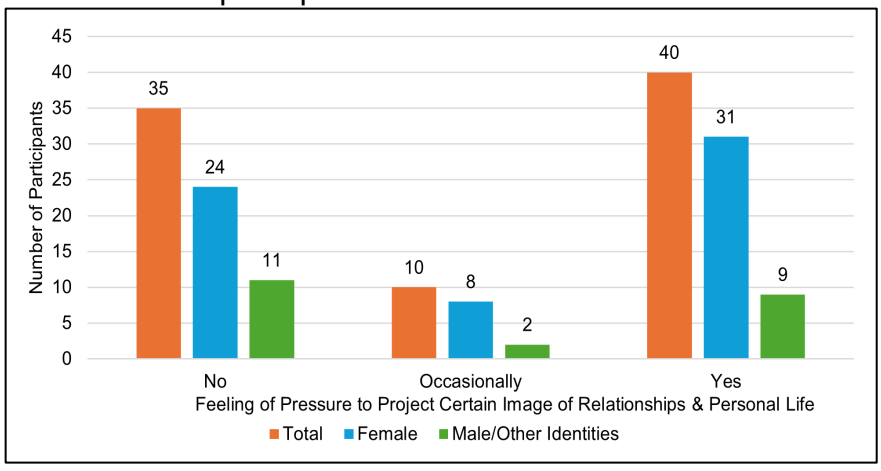
	Gender		
Do you believe that social media has influenced your perceptions of other people's lives and relationships?	Female	Male/Other gender identities	Total
No	3 (3.5%)	0 (0% or 0%)	3 (3.5%)
Not Sure	1 (1.2%)	2 (2.4%)	3 (3.5%)
Yes	59 (69.4%)	20 (23.5%)	79 (92.9%)
Total	63 (74.1%)	22 (25.9%)	85 (100%)
All percentages shown are percent of total participants			

and life experiences to what they see on social media and in another question were asked if they had ever made assumptions and judgements about someone's life or personality based on their social media posts. When accounting for gender, there was no statistical significance for either set of responses ($p > .05$).

Results Related to Research Question: What impact, if any, does social media have on how individuals present themselves?

Participants were asked: Do you feel pressured to maintain a particular image on social

Figure 9
Participants' gender differences in feelings of pressure to project a particular image of their relationships or personal life on social media



media due to societal expectations or peer influence? How do you perceive your own behaviour on social media regarding self-presentation? When responses to each question were looked at together, as in Figure 10, they were statistically significant (p = .002). This means there is a relationship between feeling pressure to maintain a certain image on social media and how participants perceive their behaviour on social media, X^2 (3 [df]) = 14.80, p = .002. Those (n = 29) who felt pressure to maintain a certain image on social media due to societal expectations also identified that they carefully curate and present an idealized version of themselves. In Table 6, a statistical analysis was conducted to observe if there was a relationship between pressure to maintain a certain image on social media and participants' ratings of the impact of social media on their lives. A statistical analysis was run, indicating a statistically significant relationship, X^2 (3 [df]) = 18.2, p = <.001. Those who answered “Yes” to feeling pressure to maintain a particular image on social media identified that social media seems to have a mix of positive and negative effects on their lives (n = 41).

Figure 10

Pressure to Maintain Certain Images on Social Media and Perception of Own Behaviour on Social Media

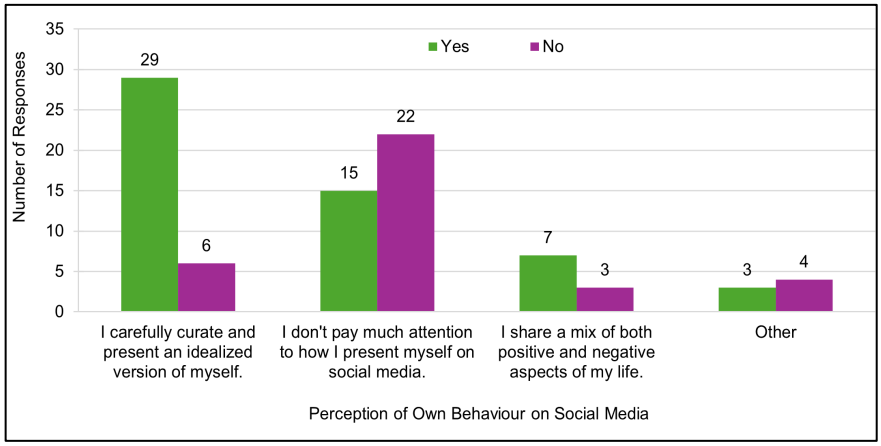


Table 6

Pressure to maintain a certain image on social media and participants' ratings of the impact of social media on their lives

	How would you describe the overall influence of social media on your life?				
Do you feel pressured to maintain a certain image on social media due to societal expectations or peer influence?	A mix of positive and negative	Mostly negative	Mostly positive	No significant influence	Total

Yes	41 (45.6%)	3 (3.3%)	8 (8.9%)	3 (3.3%)	55 (61.1%)
No	16 (17.8%)	0 (0%)	5 (5.6%)	14 (15.6%)	35 (38.9%)
Total	57 (63.3%)	3 (3.3%)	13 (14.4%)	17 (18.9%)	90 (100%)
All percentages shown are percent of total participants					

Figure 11 shows a graphical representation of the statistically significant relationship between participants ratings of the impact of social media on their self-esteem and self-perceptions and if they feel pressure to maintain a certain image on social media due to the societal expectations and peer influence they face, X^2 (3 [df]) = 12.7, p = .005. The findings shown in Table 7, although not a statistically significant finding, look at how participants' descriptions of how social media impacts their self-esteem and self-perceptions are broken down by their actual perceived behaviour on social media surrounding self-presentation, X^2 (9 [df]) = 14.7, p = .10. It can be seen that most participants indicate either a negative or neutral description of the impact and either carefully curate and present an idealized image of themselves or do not pay much attention to how they present themselves on social media.

In two survey questions, three and eight, participants were asked to rate the impact of social media on their self-esteem and self-perceptions and just the impact on their self-esteem. Upon analysis, there was a significant relationship between the two questions, X^2 (9 [df]) = 43.7, p = <.001. Most participants indicated in both questions that social media had a neutral impact on their self-esteem and self-presentations (n = 30). A statistically significant (p = .001) finding was found in participants' responses to questions three and fourteen, looking at social media's impact on self-esteem and self-perceptions and its overall influence on participants' lives (X^2 (9 [df]) = 27.3). As shown in Table 8, over a third of participants indicated that social media had a neutral impact on their self-

Figure 11

Participants ratings of the impact of social media on their self-esteem, self-perceptions and feelings of pressure to maintain a certain image on social media

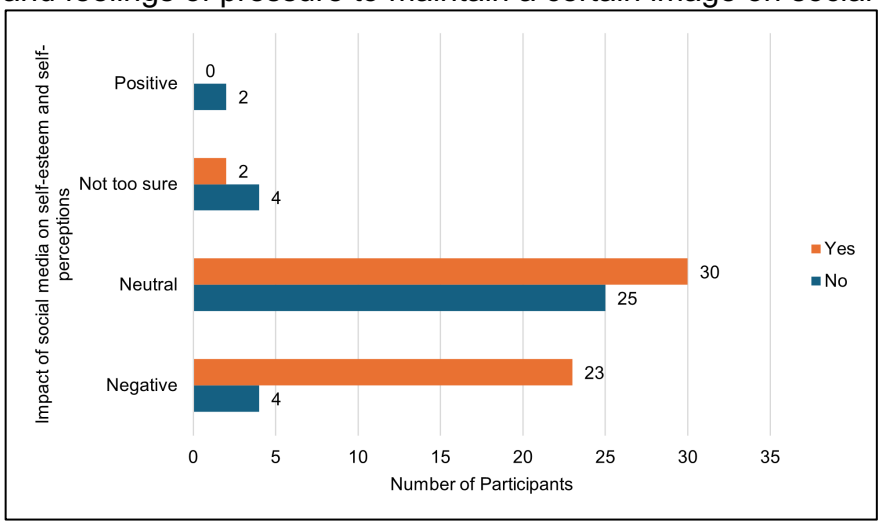


Table 7
Impact of social media on participants' self-esteem, self-perceptions and perceptions of own behaviour on social media regarding self-presentation

	How do you perceive your own behaviour on social media in terms of self-presentation?				
How would you describe the impact of social media on your self-esteem and self-perception?	I carefully curate and present an idealized version of myself.	I don't pay much attention to how I present myself on social media.	I share a mix of both positive and negative aspects of my life.	Other	Total
Negative	15 (16.9%)	10 (11.2%)	1 (1.1%)	1 (1.1%)	27 (30.3%)
Neutral	20 (22.5%)	20 (22.5%)	9 (10.1%)	5 (5.6%)	54 (60.7%)
Not too sure	0 (0%)	5 (5.6%)	0 (0%)	1 (1.1%)	6 (6.7%)
Positive	0 (0%)	2 (2.2%)	0 (0%)	0 (0%)	2 (2.2%)
Total	35 (39.3%)	37 (41.6%)	10 (11.2%)	7 (7.9%)	89 (100)
All percentages shown are percent of total participants					

esteem and self-perceptions and had a mix of positive and negative influences on their lives (n = 30).

Participants were asked: How would you describe the impact of social media on your self-esteem and self-perception? Have you ever felt pressure to project a certain image of your relationships or personal life on social media? When an analysis was run with the responses to these questions, a statistically significant relationship was found X^2 (6 [df]) = 12.9, p = .04. The two most popular response sets were a neutral impact of social media on their self-esteem and self-presentation and feeling no pressure to project certain images of relationships and personal life on social media (n = 25) and participants indicating a neutral impact of social media on their self-esteem and self-presentation and feeling pressure to project certain images of relationships and personal life on social media (n = 23).

Two analyses were conducted to observe whether time spent on social media influenced participants' self-esteem and self-perceptions and whether they compared their relationships and life experiences to what they saw on social media. There was no statistical significance in the analysis run to see if there was a relationship between time spent on social media and social media's influence on self-esteem and self-perceptions (p = .40). While the analysis, seen in Figure 12, run on social media use frequency and if

Table 8
Impact of Social Media on participants' self-esteem, self-perceptions, and overall influence on life

	How would you describe the overall influence of social media on your life?				
How would you describe the impact of social media on your self-esteem and self-perception?	A mix of positive and negative	Mostly negative	Mostly positive	No significant influence	Total
Negative	22 (24.4%)	3 (3.3%)	2 (2.2%)	0 (0%)	27 (30%)
Neutral	30 (33.3%)	0 (0%)	11 (12.2%)	14 (15.6%)	55 (61.1%)
Not too sure	5 (5.6%)	0 (0%)	0 (0%)	1 (1.1%)	6 (6.7%)
Positive	0 (0%)	0 (0%)	0 (0%)	2 (2.2%)	2 (2.2%)
Total	57 (63.3%)	3 (3.3%)	13 (14.4%)	17 (18.9%)	90 (100%)
All percentages shown are percent of total participants					

participants compared their relationships and life experiences to what they saw online was statistically significant (p = .03). Over 35% of participants (n = 34), who used social media multiple times a day said they occasionally compare their relationships and life experiences online.

Participants' responses to questions regarding their perceptions of their behaviour on social media and pressure to maintain a certain image of their relationships and personal life on social media were analyzed. After analysis, a statistically significant relationship was found, X^2 (6 [df]) = 23.4, p = <.001, As seen in Table 9, 24 participants indicated that they do not pay much attention to how they present themselves on social media and do not feel pressure to project a particular image of their relationships or personal lives on social media (n = 24). Also, those who carefully curate and present an idealized version of themselves on social media reported feeling pressure to project a certain image of their relationships (n = 24).

Results Related to Research Question: What impact, if any, does social media have on how individuals present themselves?

Table 10 shows the analysis summary of participants' responses to their social media use frequency and whether they have made assumptions or judgments about someone's life or personality based on what the person shares on social media. The analysis showed a statistically significant relationship between frequent social media usage and making

Figure 12
Frequency of social media use and comparing relationships or life experiences to others on social media

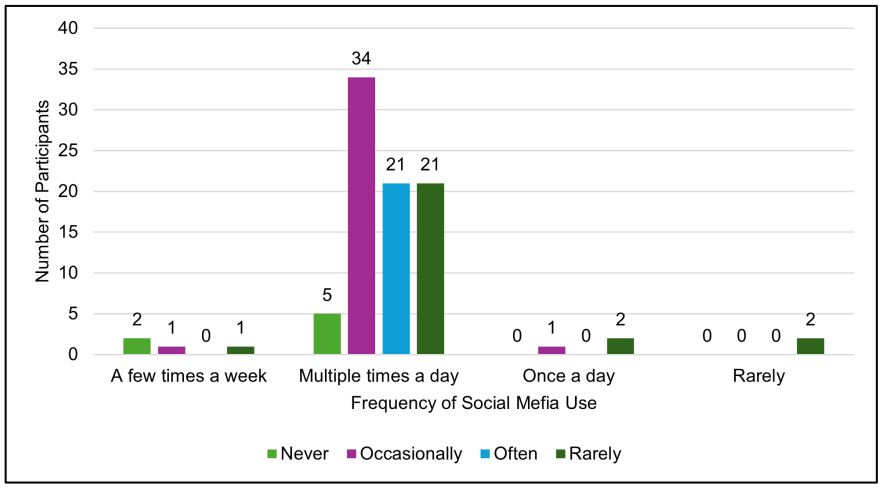


Table 9
Participants perceptions of their behaviour and pressure to project certain images of relationships on social media

	Have you ever felt pressure to project a certain image of your relationships or personal life on social media?			
How do you perceive your own behaviour on social media in terms of self-presentation?	No	Occasionally	Yes	Total
I carefully curate and present an idealized version of myself.	6 (6.7%)	5 (5.6%)	24 (27%)	35 (39.3%)
I don't pay much attention to how I present myself on social media.	24 (27%)	2 (2.2%)	11 (12.4%)	37 (41.6%)
I share a mix of both positive and negative aspects of my life.	4 (4.5%)	1 (1.1%)	5 (5.6%)	10 (11.2%)
Other	5 (5.6%)	2 (2.2%)	0 (0%)	7 (7.9%)
Total	39 (43.8%)	10 (11.2%)	40 (44.9%)	89 (100%)
All percentages shown are percent of total participants				

Table 10
Social media use frequency and making assumptions or judgments of others based on their posts

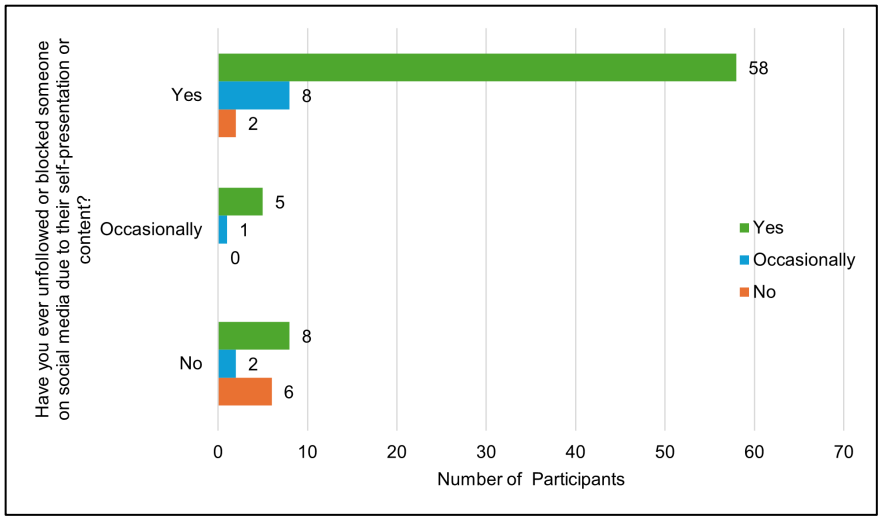
	Have you ever made assumptions or judgments about someone's life or personality based on their social media posts?			
How frequently do you use social media platforms?	No	Occasionally	Yes	Total
A few times a week	0 (0%)	1 (1.1%)	3 (3.3%)	4 (4.4%)
Multiple times a day	5 (5.6%)	10 (11.1%)	66 (73.3%)	81 (90%)
Once a day	1 (1.1%)	0 (0%)	2 (2.2%)	3 (3.3%)
Rarely	2 (2.2%)	0 (0%)	0 (0%)	2 (2.2%)
Total	8 (8.9%)	11 (12.2%)	0 (78.8%)	90/100
All percentages shown are percent of total participants				

assumptions or judgments about other people's lives based on what they post on their social media, X^2 (6 [df]) = 24.6, p = <.001. Of the participants who use social media multiple times a day (n = 81), 66 indicated making assumptions and judgments about others based on their social media posts.

Further investigating participants making assumptions or judgments about someone's life based on social media, we compared results to participants' responses to whether they have ever unfollowed or blocked someone on social media due to their self-presentation and content, as seen in Figure 13. This analysis proved a statistically significant relationship between unfollowing or blocking other people due to their self-presentation or content and making assumptions or judgments about someone based on their social media, X^2 (4 [df]) = 20.1, p = <.001. Over 60% of participants reported blocking or unfollowing someone and making judgments or assumptions about someone's life based on their social media posts and content (n = 58).

Figure 14 shows the responses to whether participants had ever made assumptions or judgments about someone's life or personality based on their social media content and whether participants believe that social media influenced their perceptions of other people's lives and relationships. Upon analysis, a statistically significant relationship was identified between those who make assumptions/judgments about someone on social media and if they believe social media influences their perceptions of other people's lives and relationships, X^2 (4 [df]) = 14.70, p = .005. Over 75% of all participants indicated that they make assumptions about others based on their social media posts and believe social media influences these perceptions of others (n = 69).

Figure 13
Relationship between unfollowing or blocking other people due to their self-presentation or content and making assumptions or judgments about someone based on their social media



Results Related to Both Research Questions

Two statistically significant findings were found that support both research questions. The first analysis looked at participant patterns of unfollowing or blocking someone on social media and their ratings of the overall impact of social media on participants' lives. The analysis showed a statistically significant relationship between unfollowing or blocking someone on social media and the overall impact of social media on participants lives, X^2 (6 [df]) = 13.1, p = .04. As seen in Table 11, over 50% of participants indicated they have unfollowed or blocked someone on social media due to their content and that social media has a mix of both positive and negative influence on their life overall. Figure

Figure 14
Relationship of making assumptions/judgments about someone on social media and if they believe social media influences their perceptions of other people's lives and relationships

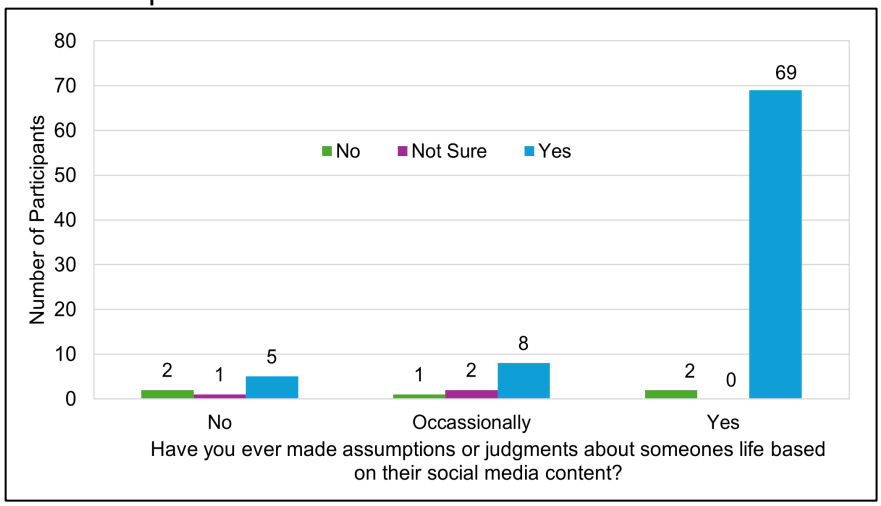
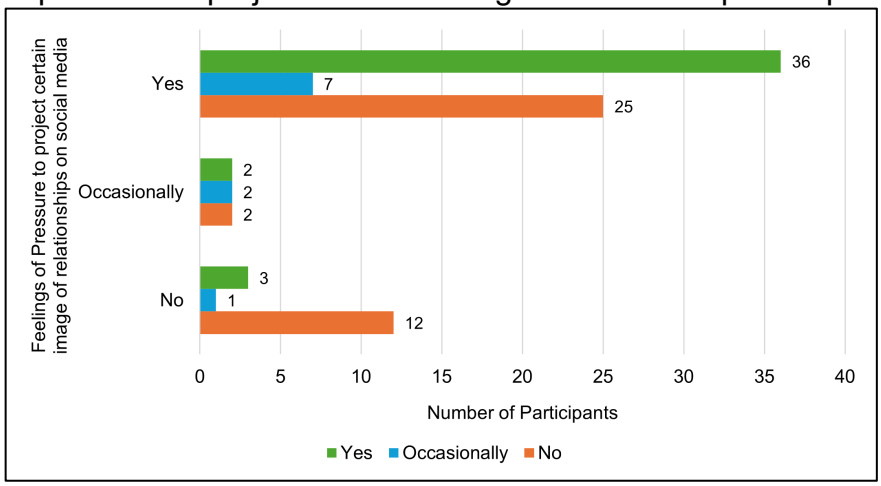


Table 11
Participants responses to unfollowing/blocking others on social media and the overall influence of social media on their lives

	How would you describe the overall influence of social media on your life?				
Have you ever unfollowed or blocked someone on social media due to their self-presentation or content?	A mix of positive and negative	Mostly negative	Mostly positive	No significant influence	Total
No	6 (6.7%)	0 (0%)	4 (4.4%)	6 (6.7%)	16 (17.8%)
Occasionally	3 (3.3%)	1 (1.1%)	0 (0%)	2 (2.2%)	6 (6.7%)
Yes	48 (53.3%)	2 (2.2%)	9 (10%)	9 (10%)	68 (75.6%)
Total	57 (63.3%)	3 (3.3%)	13 (14.4%)	17 (18.9%)	90 (100%)
All percentages shown are percent of total participants					

15 looks at the relationship between unfollowing and blocking someone on social media and feelings of pressure to project a certain image of relationships and personal life on social media, X^2 (4 [df]) = 11.1, p = .03. Participants who reported blocking and unfollowing of others on social media due to their self-presentation indicated feeling both

Figure 15
Relationship between unfollowing and blocking someone on social media and feelings of pressure to project a certain image of relationships and personal life on social media



no pressure to project a particular image of their relationship online (*n* = 25) and feelings of pressure to no pressure to project a particular image of their relationship online (*n* = 36).

Qualitative Results

Qualitative data was gathered through four open-ended questions in the survey. This section will cover common themes found within responses to each question.

Can you describe situations in which social media has played a positive role in shaping your self-perceptions? Conversely, can you share examples of negative influence?

This question had a response rate of 78%. The themes that were identified were sub-grouped into positive influences and negative influences. Overall, participant responses show that while social media offers various benefits such as connection, creativity, and support, it also presents challenges like comparison, cyberbullying, and unrealistic expectations, which can impact self-perception both positively and negatively.

Positive Influences

Theme	Summary	Participant Responses
Allows for self expression	Participants indicated that social media can be a tool for self-expression, creativity, and connecting with others. It provides opportunities for personal growth, learning, and building a supportive network.	"The way social media has played a positive role is through online communities that align with my interests and experiences and provide me with a safe space that has allowed me to express myself and provide support when needed." "Social media has connected me with supportive transgender communities, providing validation and understanding."
Affirmations and encouragement	Participants indicated that social media platforms have been instrumental in promoting body positivity, providing resources for self-improvement, and facilitating connections with others who share similar experiences and interests. Some users also find affirmation and encouragement through social media, receiving positive feedback and support from friends and followers.	"Providing peer support that I didn't think I had, or others I didn't think would reach out." "Being part of supportive artistic communities allows individuals to receive positive feedback, encouragement, and recognition for their creative endeavours, boosting their confidence and self-perception."
Confidence and self-love	Responses from participants indicated that social media has	"Social media has allowed me to feel 'normal' and to practice self

	allowed individuals to feel "normal" and practice self-love. It boosts confidence when posts receive positive feedback, and it helps individuals feel less isolated by finding relatable content and supportive communities online.	love and has made me feel confident when I post something and lots of people appear to like it…" "I mean I get a lot of positive comments and feel like I am perceived very well from a mass audience so it's given me a ton of confidence."
Learning	Participants responses showed social media can also serve as a platform for learning and self-improvement. Social media provides access to diverse perspectives and communities.	"…providing a platform for positive affirmations, connecting with supportive communities, and sharing achievements, fostering a sense of accomplishment and self-worth." "there's a lot of diverse influencers who share positivity about minority groups (one to which i belong) and their cultures, makes me happy and proud to be one of those people."

Negative Influences

Theme	Summary	Participant Responses
Unrealistic expectations	Participant responses showed social media can contribute to unrealistic beauty standards, cyberbullying, and feelings of inadequacy through comparison with curated content. These sites can perpetuate toxic diet culture, misogyny, and unrealistic expectations, leading to negative self-perception and harmful behaviors.	"People fronting their perfect lives, setting unrealistic standards. Can mess with your head, making you feel inadequate or like you're missing out." "setting negative and unrealistic expectations that drive unhealthy mindsets and behaviors"
Distressing content	Social media can lead to exposure to distressing content like war scenes can lead to feelings of sadness and overwhelm.	"… also made me feel very sad with so much terrible footage of war scenes and bombings which can be overwhelming"
Insecurity, inadequacy, and anxiety	Participants indicated social media can also foster feelings of insecurity, inadequacy, and anxiety, especially when individuals compare themselves	"social media can make you feel insecure in various ways such as what you wear, how you look, where you go, who you go with, almost everything could become an insecurity due to the pressure

	to others or face cyberbullying and harassment online.	of social media to be a certain way” “Instagram's emphasis on perfection and comparison has sometimes left me feeling inadequate. Seeing influencers with seemingly flawless lives can trigger feelings of jealousy or self-doubt. At times, I've found myself obsessing over my appearance or comparing my achievements to others, which has taken a toll on my self-esteem.” “looking at other people doing well in their careers, even with their carefully curated social media presence, demotivates me and induces anxiety about my own future, negatively impacting my self perception.”
Jealousy	Responses identified that social media can lead to feelings of jealousy, self-doubt, and pressure to conform to unrealistic standards. The emphasis on perfection and comparison can erode self-esteem and contribute to mental health issues.	“the pressure to maintain a curated image and the comparison trap can lead to insecurity and self-doubt.”

How do you believe social media impacts how we perceive beauty, or relationships? Can you provide examples from your own experiences or observations?

This question had a response rate of 78%. Five main themes were identified from this response set, showing the complex and multifaceted nature of social media's influence on perceptions of beauty and relationships, encompassing both positive and negative aspects.

Theme	Summary	Participant Responses
Self-Esteem and Mental Health	Participants indicated Concerns about the impact of social media on self-esteem and mental health are evident, with many expressing worries about the effects of constant comparison and exposure to idealized images.	“Personally, I've observed friends feeling pressure to conform to these standards, leading to self-esteem issues and even harmful behaviors like extreme dieting or cosmetic procedures.”

Influence of Beauty Standards	Responses showed social media platforms contribute to the perpetuation of beauty standards by promoting edited and filtered images that set unrealistic ideals. Users reported feeling pressured to conform to these standards, leading to issues with self-esteem and body image.	“I think it sets an unreasonable standard for beauty for everyone. This isn’t all bad though. Of course, it can raise insecurities within people and cause their self esteem to be lower. It can also encourage people to change their appearance in an attempt to conform to what they see all over the internet. However, it can also encourage you to try and be the best version of yourself if you’re seeing what looks like people reaching their full potential on the internet everyday”
Glorification vs. Authenticity	Social media was indicated to often portray beauty and relationships in an idealized manner, showcasing only the positive aspects while masking the challenges and imperfections. This disparity between reality and portrayal can create unrealistic expectations. Some individuals express concern about the lack of authenticity on social media platforms and its potential impact on vulnerable audiences.	“Most people present their ideal self on social media. Which means that it is unrealistic. I think it’s harmful not being able to see people be a least slightly authentic. Especially for young children who are very impressionable and vulnerable to these sorts of ideas.”
Influence on Relationships	Participants indicated social media can influence perceptions of relationships by showcasing only the positive aspects, leading to unrealistic expectations. Comparison with idealized relationships portrayed online may impact individuals' satisfaction with their own relationships.	“The relationships I have with people online feel like they are based in the ideas we have of each other. I feel as though people don’t get a sense of the real me in real-time because I can take hours to formulate I perfect response that I think they will respond well to, as opposed to my natural reactions to things. I can get along really well with people online and then not enjoy their company in person, because they aren’t who I thought they would be or vice versa.”

Consumerism and Capitalism	As indicated by participants the beauty industry's presence on social media contributes to the promotion of consumerist ideals, as trends and standards constantly evolve, encouraging individuals to purchase products or undergo procedures to meet societal expectations.	“New trends and aesthetics have been creating these unrealistic standards and further promoting consumerism in so many ways that are altering and affecting the way we view ourselves and others. We are constantly trying to fit in or label ourselves into a category that makes it so difficult to view ourselves positively. Something I've noticed is how quick people are to hate on something that isn't in trend, if someone expresses any likeness towards out-of-trend things, they get hated on or questioned for their taste.” “OH MY GOD. Our culture is SO obsessed with beauty!! What the heck are we even talking about?? There's a new trend every week I feel. I feel like women especially are told that their value is held in their beauty, which is NOT true. Everyone is so obsessed with beauty and you know what the root issue is?? THAT'S RIGHT. CAPITALISM. THEY ARE PROFITING OFF OF INSECURITIES AND WHENEVER THERE IS A NEW TREND, THEY MAKE MONEY. Also, there's an obsession with "glowing up" and I mean it can be good in some aspects, but there's a LOT of toxic stuff online... Like the comeback of the "heroin chic" trend?? do people even hear themselves???? what are we doing??”

Can you describe how you decide what to post on social media to present yourself to others? What factors influence your decision?

Five main themes were identified from this response set, and this question had a response rate of 78%. These themes highlight the complex interplay of personal, social,

and psychological factors influencing individuals' decisions about what to post on social media.

Theme	Summary	Participant Responses
Aesthetic considerations	Participants indicated the aesthetics of a post, including how they look and the overall visual appeal, play a significant role in deciding what to share on social media.	"…if it is my main account, it would be more sophisticated, and aesthetic." "I consider the overall aesthetic and tone of my feed, ensuring consistency while allowing room for creativity and spontaneity." "Fun activities or a night out - which include good aesthetic pictures. How I look in them. How my friends look. Make sure to present the best angles and side."
Spontaneity vs. Planning	From participant responses, There's a spectrum between spontaneous posting and strategic planning. Some individuals post impulsively, while others carefully curate their content to maintain consistency and engage their audience effectively.	"I just throw stuff up there, I don't really care what people think. Sometimes it's a random selfie, sometimes it's food, or just a dumb joke. Zero planning, just whatever's on my mind. Maybe if I'm doing something cool or want to share a laugh. But it's all spur-of-the-moment. I ain't trying to impress anyone. Social media's just a place to kill time, not a stage for some grand performance."
Privacy and safety	Responses showed participants have concerns about privacy and safety, and potential negative repercussions influence decisions about what to post. Some individuals are cautious about sharing sensitive information or content that could lead to judgment or backlash.	"I'm mindful of privacy concerns and potential repercussions of sharing sensitive information." "I'm cautious about privacy and potential backlash, prioritizing self-care and positive representation." "I consider authenticity, safety, and advocacy. I share experiences that validate my identity, promote transgender visibility, and connect with supportive communities."
Social comparison and peer influence	Participants show a desire to present a lifestyle that others may envy or find impressive, which is evident in some responses, indicating social	"What influences my decision is if other people will think about me when I post it and if their opinion on me will change in a negative way."

	comparison and peer influence are factors in decision-making.	“I realize that I have some anxiety around posting anything, because I fear that I may post the wrong thing from my camera roll or that I will be perceived poorly by social media audiences.” “Use it as a memorial of the memories I’ve made or things I don’t want to forget. Peer influence isn’t a major concern.”
Personal enjoyment and meaning	Some participants primarily post content that brings them joy or serves as a digital scrapbook of meaningful experiences rather than focusing on others' reactions. Emotional factors, such as feeling confident in a post or worrying about judgment from others, also impact decision-making regarding social media content.	“I will post myself enjoying things and life and pictures where I think I look good but not overly fake” “I just post things that I personally enjoy or had a good time doing”

How do you decide what aspects of your life to share on social media, and what do you choose to keep private? Can you explain your thought process?

This question had a response rate of 68.89, where five main themes were identified from participant responses. These themes demonstrate individuals' complex thought processes when deciding what to share on social media and what to keep private. Ultimately, the decision is influenced by privacy concerns, safety considerations, personal values, and past experiences.

Theme	Summary	Participant Responses
Preference for positive experiences	Some participants choose to share positive experiences on social media, such as holidays or special occasions while keeping negative experiences private. As well, some indicate often sharing only what they feel comfortable with or what they believe would be acceptable to their audience. They may share achievements and happy moments but keep certain aspects of their lives private, such as relationships and hardships.	“I prefer to share positive experiences because if I experience something negative I rely on my actual friends for support rather than my followers.” “I show positive aspects of my life, such as; pictures with friends, family, and my partner. If I like a picture I just post it”

Boundary setting	Participants establish boundaries for what they share online, often based on their comfort level and the nature of their relationships with their followers. They may share certain aspects of their lives with close friends but keep other details private.	"I also recognize the importance of boundaries and choose to keep certain aspects of my life private, such as personal struggles, intimate relationships, and sensitive information. This decision stems from a desire to maintain a sense of autonomy, protect my privacy, and respect the privacy of others." "I keep private matters such as family, relationships, and sensitive issues off-limits to safeguard personal boundaries and respect privacy"
Content selection	Participants indicated choosing to share content based on aesthetics or what makes them look good. They may post pictures that are aesthetically pleasing or reflect positively on them.	"My decisions prioritize engaging content that adds value to my platform while balancing transparency with maintaining a level of discretion for personal well-being"
Alignment with personal values	Responses show participants may choose to share content that aligns with their values, interests, and the image they wish to convey. They prioritize authenticity while respecting their privacy and the privacy of others.	"I prioritize sharing moments that align with my values, interests, and the image I wish to convey. These often include achievements, experiences, and insights that will resonate positively with my followers, fostering connection and authenticity."
Safety considerations	Participants showed that concerns about safety influence what they share on social media. They may avoid sharing personal information, such as their location or family details, to protect themselves from potential harm.	"things i wouldn't be comfortable with strangers knowing, things that could implicate my safety, mostly positive or fun content" "I share aspects of my life that validate my identity and contribute to transgender visibility while prioritizing safety and mental health. I keep private details that could compromise my well-being or invite discrimination, striving for authenticity while protecting myself from harm."

Discussion

Social media has impacted how individuals present themselves online, as these online platforms have become spaces where we can curate an idealized version of ourselves. This digital realm creates various opportunities for personal branding and self-expression, allowing individuals to create an image that will fit societal standards. Through a dramaturgical framework, our study explored how individuals use social media as a stage for self-presentation and expression.

The findings from our study indicated that 71.1% of the participants engaged in impression management to curate a certain image on social media, varying in frequency. This aligns with Goffman's concept of the front stage, as individuals uphold a specific image in the public eye (Goffman, 1959). Most often, individuals will attempt to conform to the norms and expectations of their desired audience through selective sharing, filtering, and false presentation. By doing so, they will gain validation and acceptance through the number of followers, likes and shares. In addition, 61.1% of the participants feel pressured to maintain a particular image on social media, stemming from societal expectations and peer influence. At the same time, nearly 50% felt pressure to project a particular image of their relationships and personal lives. This pressure resonates with Goffman's idea of the theatrical stage and script, as the actor must adhere to a particular script when performing in front of an audience (Goffman, 1959). To maintain their ideal image, they strategically utilize various props to enhance their performance (Goffman, 1959). This process involves curated posts and interactions that align with their audience's perception, through which they seek validation and reassurance. The constant stream of false realities creates an unrealistic standard among social media users, further creating feelings of insecurity. By applying Goffman's dramaturgical lens, we gained deeper insight into how individuals interact on social media, highlighting how societal expectations and peer influence play a crucial role in their performance.

Our results also substantiated that participants showed cognitive dissonance when using social media. 34.3 percent of participants stated that social media negatively affects their self-esteem, yet ninety percent said they still use it multiple times a day. Social media breeds comparison, as we saw an association between participants' frequency of social media use and how often they compare their relationships and life experiences to what they see on social media. Our analysis also discovered that individuals who used social media more frequently made more assumptions or judgments about other people's lives based on their social media. Based on these correlations, we can conclude that social media use negatively affects participants, including increased comparison and judgement. Although participants reported being aware of social media's negative impact on their judgements of others and their self-esteem, they continue to use it, which causes a sense of dissonance.

Festinger (1957) suggested that individuals cope with this dissonance by "discrepancy reduction," which can be reflected in our results. For example, 81% of female and 59.1% of male participants reported unfollowing or blocking someone on social media due to the other accounts' self-presentation or content. Following these people may have conflicted with participants' beliefs or their content, giving them a sense of discomfort. Therefore, unfollowing them may have reduced participants' sense of dissonance by using a discrepancy reduction strategy (Festinger, 1957).

Brewer's (2007) optimal distinctiveness theory provides a framework to understand participants' online behaviours regarding self-presentation and identity formation on

social media. The theory states that individuals seek social identities to satisfy two needs: desire for group affiliation and personal distinctiveness (Brewer, 2007). Qualitative participant responses to our survey exemplify this, as they engage in self-presentation strategies that reflect their desire for group affiliation and personal distinctiveness. For example, participants stated the importance of receiving compliments and finding relatable content online, which enhances their sense of belonging. Simultaneously, they grapple with a decrease in positive self-perception when encountering others online who seemingly possess more desirable attributes. Additionally, participants demonstrate a strategic approach to identity and content curation online by aligning their online profiles with their desired image and keeping personal boundaries by keeping some aspects that do not align private. This relates to optimal distinctiveness theory's emphasis on balancing social inclusion with maintaining personal uniqueness. These findings contribute to a deeper understanding of how individuals navigate their online identities to fulfil their social and psychological needs within the framework of optimal distinctiveness theory.

Considering Swann's (2007) self-verification theory, our research findings showcase the dynamic interplay between individuals' self-perceptions and the pressures put on them by social media. Swann's theory states that individuals strive for consistency between their self-concept and the impressions they wish to convey to others (Swann, 2007). Our results reveal that most participants (61.1%) reported feeling pressured to uphold a particular image on social media platforms, driven by societal and peer influences. This aligns with self-verification theory, as individuals may feel compelled to maintain a consistent online persona that aligns with their desired self-image, even if it deviates from their authentic selves. Additionally, most participants (91.1%) reported that social media has influenced their perceptions of other people's lives and relationships. This suggests that individuals may engage in self-verification processes not only in shaping their own online identities but also in interpreting and comparing themselves to others' curated identities on social media. Thus, our findings align with Swann's self-verification theory in the context of social media, highlighting the influence on individuals' self-concept maintenance and interpersonal perceptions.

Our research yielded a key finding where gender did not appear to be a substantial factor in determining how often individuals curate their online image on social media. This trend remained consistent even when examining whether societal expectations pressured men and women to uphold a particular image of themselves. These findings are intriguing, considering previous literature that suggests a stronger emphasis on image curation among specific genders.

For instance, a study conducted by Dhir et al., (2016) delved into age and gender disparities in selfie-related behaviours and was conducted through an anonymous online survey with 3763 participants. The findings suggest that women are more prone than men to engage in self-presentation through selfies and curated content on social media platforms (Dhir et al., 2016). Moreover, it is revealed that females more actively take and post selfies, while also editing the photos using cropping and filters than their male counterparts (Dhir et al., 2016).

Previous research findings support these results and indicate that women often post selfies to manage the impression they create of themselves, helping to build their online identity, communicate with others, and grow their social network, all while seeking social approval (Manago et al., 2008). The selfies are also used to indicate that they belong to

a social group or circle. These results highlight the persistent trend among women to utilize social media platforms for various social and self-expression purposes. However, while men are also affected by social media, they are less likely to be influenced by it and tend to respond differently (Manago et al., 2008).

Furthermore, this research indicated that women exhibit a higher susceptibility to social media addiction than men, which adversely impacts self-esteem and body image (Dhir et al., 2016). A common theme in our research was heightened feelings of insecurity and inadequacy due to social media pressure. Several participants stated that the increased exposure to online perfection and idealism triggers feelings of jealousy and self-doubt, ultimately impacting their overall self-esteem. Continuous comparison with curated images, lifestyles, and standards can take an emotional toll on users as they scrutinize their realities for not measuring up.

Other literature is consistent with our findings, such as the research done by Colak et al., (2023), which investigated the relationship between social media addiction and self-esteem to understand its effects on adolescent body image. This study used scales and questionnaires to evaluate self-esteem, body image and social media dependency (Colak et al., 2023). They found a negative relationship between self-esteem and social media addiction, indicating that as an individual's social media addiction increases, their self-esteem decreases (Colak et al., 2023).

Consistent with these findings, previous literature suggests that the level of social media usage is a variable that can affect one's self-esteem. Takieddin et al., (2022) conducted a cross-sectional study of 373 medical students using an online questionnaire to explore the effects of social networking on academic performance and self-esteem. Their findings indicate that excessive social media usage is detrimental to students' mental health, suggesting a persistent correlation between social media use and self-esteem (Takieddin et al., 2022). These findings align with our research as it recognizes that excessive social media use can harm individuals' mental health and self-esteem.

Broader Significance

The rise of social media has fundamentally shaped how we present ourselves beyond the physical realm. The strain between self-expression and an idealized image is causing individuals to feel disconnected from their authentic identity and further contributing to feelings of inadequacy, insecurity, and social pressure. Our research delves into this dynamic, examining how social media usage impacts our self-presentations online and mental health. Further gaining broader insight into how social comparison can alter our self-perception and increasing the pressure to project idealized versions of ourselves. Ultimately, our work offers a strong foundation for navigating the online world and future research, uncovering the interplay between self-presentation, social media, and our well-being in this digital landscape.

Conclusion

The results of this study offer valuable insights into the intricate interplay between social media engagement and individuals' perceptions of self and behaviour. The findings revealed a prevalent pressure among participants to cultivate and sustain a specific online persona driven by societal expectations and peer influence. While a majority of respondents reported a neutral impact of social media on their self-esteem, a substantial

proportion acknowledged negative implications stemming from comparison, cyberbullying, and the perpetuation of unrealistic standards within digital spaces. Despite these challenges, a noteworthy subset of participants positively perceived social media's influence on their lives, indicating diverse experiences and perceptions. Furthermore, the observed prevalence of pressure to conform to curated representations of personal relationships highlights the importance of fostering digital literacy and promoting strategies for navigating social media that prioritize authenticity and well-being. Addressing these complexities will be integral to fostering healthier online environments conducive to genuine self-expression and positive social interactions.

Limitations

In the realm of academic research, it is integral to evaluate and acknowledge potential limitations present that may hinder the validity and integrity of the study. The first limitation presented itself as a conflict of interest. The student population was our peers, who come from the same population, which did influence participation, significantly impacting the integrity of decision-making during survey participation and leading to potentially biased answers. While this limitation introduces a form of self-reporting bias, it is crucial to recognize that it plays an integral role in preserving the privacy of undergraduate students at McMaster University. Due to our research focusing on the undergraduate population, we must aim to protect the confidentiality and integrity of our participants. Although self-disclosed information runs the risk of biases and discrepancies within answers, it was the best way to ensure that the integrity and privacy of this study were not lost or jeopardized.

Similarly, another limitation that impacted our study was sample bias. As the sample population for our study is undergraduate students, it became harder to generalize to the broader population. Our research primarily focused on younger undergraduate students due to its focus on social media, limiting the generalizability of our findings to the broader population, including older adults. As mentioned earlier, our research solely focuses on the undergraduate population; this is notably more convenient as it aligns with their academic environment. Involving older adults in specific social media studies is significantly more challenging due to their decreased likelihood of participation and less experience with social media. In several other studies, we identified similar limitations regarding the sample population; for example, Bracket-Bojmel et al., (2015) explored the relationship between the motives for self-presentation and likes and comments on Facebook. Their study sample included undergraduate students. As this study centres exclusively on social media, the sample population should be composed of active users of these platforms.

A significant limitation of this study was the self-reporting bias that may have been present, as our study used an anonymous online survey. Participants adhered to self-reporting their data, leaving room for inaccurate or incomplete information, potentially leading to biased answers (Dutot, 2020). While this approach allows participants to give a firsthand perspective of their lived experiences anonymously, we must acknowledge that we relied on the participants to accurately and comprehensively report their data.

Our study was also subject to social desirability, as respondents may have felt pressured to present themselves in a way they wanted to be perceived rather than discuss their authentic experiences and opinions. Furthermore, participants might have answered

in ways that aligned with social expectations and did not deviate from the norm, heavily hindering the accuracy of the data, as seen in Gil-Or et al., (2018).

Furthermore, a notable limitation of our research was its cross-sectional design. While this method enabled us to capture a snapshot of how social media influences self-presentation and perceptions of ourselves and others, it is limited to a single point in time. This prevented us from profoundly understanding how social media impacts behaviours over time. We could not determine if the increased social media usage led individuals to alter their self-perception or perception of others or vice versa. A longitudinal study would be more appropriate for this purpose, as it would allow the observation of participants' attitudes and behaviours over an extended period. This longitudinal approach would provide a more comprehensive understanding of social media usage patterns, self-presentation styles, and perceptions of others as individuals continue to engage with these platforms. Moreover, it would facilitate the exploration of the complex interplay between social media and social behaviours while also allowing for identifying a cause-and-effect relationship between the factors.

Lastly, the ethical integrity and privacy of the participants might have been impacted if they, as participants, had replied to an email or interacted with a post related to the survey, giving up their identity. In conclusion, acknowledging and addressing these limitations, such as conflict of interest, sample bias, self-reporting bias, social desirability bias, the design of the study, and ethical concerns, is essential to maintain the credibility and transparency of the study and assist with the interpretation and significance of the findings.

Significant Insights

A key theme in our research was the stark contrast between the "curated self" individuals showcase online and their authentic selves. Social media platforms emphasizing aesthetics and curated narratives encourage users to prioritize projecting a specific image. Our findings showed that most undergraduate students felt pressured to maintain a curated version of themselves on social media to adhere to societal expectations.

Social media's influence extends beyond self-presentation. Our research investigated how social comparison, a natural human tendency, is amplified in online spaces. Users are constantly bombarded with carefully curated media of others' lives. Perceptions of others on social media can become skewed, leading to a warped sense of what constitutes a "normal" life or appearance.

Considering social media's comparative and observative nature, our findings contribute to societal understanding of how these platforms exacerbated social comparison among users, leading to increased feelings of inadequacy and distorted perceptions. In addition, our study expands on how communication and interactions within the digital realm shape self-expression and identity.

Future Research

Building upon our findings, future research can explore other factors and contexts that shape self-presentation and interaction dynamics in a digital space. By examining a diverse demographic, future researchers could enhance the generalizability of the study while also investigating the influence of additional factors on social media usage.

Additionally, future research could develop interventions or tools to foster authenticity and mindfulness on social media platforms, aiming to mitigate the negative impact on one's self-esteem and mental health.

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Climate Change and Student Stress: The Impact of Climate Change on the Mental Health of University Students

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Abstract

The prevalence of climate change in our world today has provoked immense fear and panic among members of society. As young people who are navigating the world during this unprecedented time, university students are especially impacted by environmental changes. Utilizing a mixed-methods approach, this study explores how university students' mental well-being is impacted by climate change. To understand this relationship, environmental identity, climate anxiety, and negative feelings towards climate change were studied. Additionally, students' program of study was investigated as a moderator of this relationship, to determine whether students in science-based programs were more strongly impacted by climate change. This study was conducted through the use of an anonymous online survey consisting of both quantitative and qualitative questions distributed to the McMaster University undergraduate population. This survey accumulated a total of 40 complete responses that underwent statistical and thematic analysis. Findings revealed that the mental health of undergraduate students was strongly impacted by climate change. Additionally, those in science-based programs identified more strongly with the environment and experienced greater anxiety and overall negative feelings towards climate change than those in non-science-based programs. While this topic is still in need of additional research, this study provides insight into the social implications of climate change by understanding how impacts the mental health of university students.

Introduction

Climate change is a highly prevalent issue that individuals across the world continue to face (NASA, 2023). Our current behaviours are creating immense and irreversible changes to the climate, resulting in various environmentally and socially negative consequences (Cianconi et al., 2021). Beyond the biological and somatic impacts of climate change, this issue also creates more social concerns pertaining to the well-being of individuals (Clayton et al., 2017). Narratives of climate change are ever-so present in empirical research, yet there is a lack of focus when it comes to societal implications and influences on mental well-being. With respect to this neglect in the

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research field, the goal of our research was to understand how the issue of climate change impacted the mental well-being of undergraduate students. Throughout the research process, we applied our research findings to existing theoretical perspectives to establish a relationship between environmental identity, climate anxiety, and students' well-being. Our research was approved by the McMaster Research Ethics Board (MREB#: 0327).

Social Psychological Context

Our research team selected three existing social psychological theories to further understand the relationship between well-being and climate change. We ultimately focused on social identity theory, environmental identity theory, and terror management theory to analyze and further interpret our findings. We explored the concept of social identity and the impacts that social groups have on individuals' self-concept, which can influence beliefs surrounding climate change (Islam, 2014). We also examined environmental identity theory, a subset of social identity theory, which focuses on individuals' beliefs and behaviours in relation to the environment (Clayton, 2004). Finally, we analyzed terror management theory to understand the relationship between climate change and negative emotions. Terror management theory investigates how humans manage the negative emotions associated with feelings of risk and mortality (Van Lange et al., 2012). Regarding climate change, appropriate terror management can help alleviate some of the negative emotions that relate to climate crises and the associated risks.

Purpose

Current research surrounding climate change often takes an environmental perspective. To expand on this naturalistic focus, it is important to examine the implications of climate change from a more humanistic perspective by exploring the correlation between climate change and the mental well-being of individuals. Using this objective, we explored these research questions: *How does climate change affect the mental well-being of undergraduate students*? *How do these effects differ between programs of study*?

We sought to answer these questions by distributing an online anonymous survey using scales pertaining to participants' feelings toward climate change. After further analysis of our selected theories and included scales, we took a particular interest in environmental identity and how individuals' feelings are influenced by climate change through this lens.

Overview of Paper

To establish an appropriate foundation for understanding our research topic, we conducted a literature review and explored three social psychological theories that we then applied to our research questions. Subsequently, we outlined our research process, methodology, and described how we performed our data analyses. We then shared both our quantitative and qualitative findings through various figures and tables, which were further analyzed in the discussion section. Finally, we concluded by conveying the limitations and significant insights found throughout our research process.

Literature Review

Climate change has been rapidly occurring over the last few centuries which has caused detrimental impacts to the planet and extreme weather events like floods, droughts, fires, and earthquakes (Cuijpers et al., 2023). These occurrences have had direct impacts on the physical health of individuals; however, climate change has also had a major impact on individuals' mental health. Climate events have increased the prevalence of several mental health disorders including post-traumatic stress disorder (PTSD), depression, and anxiety (Cuijpers et al., 2023). Climate change has also increased stress levels and substance abuse and caused emotional distress and feelings of frustration and grief (Clayton et al., 2017; Stanley et al., 2021). Canadians are particularly vulnerable to these impacts, considering Canada is "warming twice as fast as the global average" (Hayes et al., 2019, p. 2). Young people are also particularly at risk for eco-anxiety and post-traumatic stress in relation to climate change, given the effects it will have on their future (Patrick et al., 2022). The following literature review will summarise current research on the effects that climate change has on mental health. Three key themes were extracted from the literature: direct effects, indirect effects, and the effects on young people. These themes highlight the importance of understanding how climate change influences mental health and therefore, the importance of our topic of study and the population we chose to examine. After this discussion, the major limitations of the literature will be examined.

Prior to analyzing the current literature regarding climate change and mental health, it is necessary to define key terms that will be used throughout the review. 'Climate events' refer to "discrete episodes of extreme weather or unusual climate conditions, often associated with deleterious impacts on society or natural systems" (Cuijpers et al., 2023, p. 639). 'Mental health' is defined as the psychological and social well-being of individuals (Hayes et al., 2019). 'Young people' refers to individuals under the age of 35, given this encompasses the age of most university students (Schwartz et al., 2023). Several new terms have been introduced in reference to the effects of climate change on mental health, one of which will be used in this review: 'eco-anxiety' (Stanley et al., 2021). 'Eco-anxiety' is defined as the "anxiety experienced in response to the ecological crisis" (Stanley et al., 2021, p. 1). The creation of this term highlights the extreme mental health effects individuals have been experiencing as a result of climate events.

Direct Effects

Direct climate events cause "trauma associated with extreme weather events" (Patrick et al., 2022, p. 711). Some examples of these events are storms, heatwaves, and wildfires (Clayton et al., 2017). Consequently, these events directly impact mental health by increasing levels of PTSD, depression, suicidal thoughts, and substance use disorders (Cuijpers et al., 2023). Patrick et al., (2022) performed a study to understand how climate change affected the mental health of over 5000 Australian citizens. Most of these individuals had experienced direct effects of a climate change-related event. Of these individuals, one in four had met the criteria of post-traumatic stress disorder (Patrick et al., 2022). Further, Clayton et al., (2017) found that climate events increase levels of suicide and suicidal ideation in response to the increasing temperatures occurring due to climate change. Additionally, it has been shown that heat levels increase aggression, negative thoughts, decreased cognitive functioning, and lack of

problem-solving (Berry et al., 2010; Clayton et al., 2017). Similarly, Yoo et al., (2021) conducted a study in New York looking at hospital visits in relation to climate change. They found an association between higher temperatures and hospital visits for mental health-related concerns such as mood and internalizing disorders (Yoo et al., 2021). Palinkas & Wong (2020) explain potential reasons as to why this may be occurring, given that increased heat leads to body dehydration, which can cause decreased cognitive functioning. Higher temperatures also suppress thyroid hormones which can lead to cognitive impairments such as low mood and lethargy (Palinkas & Wong, 2020).

Indirect Effects

Among the direct effects of climate change, indirect effects are also prevalent causing environmental, social, and economic disruptions (Patrick et al., 2022). Some examples of these effects include economic uncertainties and migration (Cuijpers et al., 2023). Along with the direct physical effects of climate change, occupational structures and agricultural conditions can also be destroyed, leading to economic difficulties for individuals (Cuijpers et al., 2023). Additionally, other areas around the world are becoming less habitable or destroyed completely, causing individuals to forcefully migrate to other locations (Cuijpers et al., 2023). Decreasing food security and weakened infrastructure also contribute to the indirect effects of climate change (Clayton et al., 2017). These effects can create a sense of lost autonomy because individuals no longer feel like they are in control of their environment, leading to poorer mental health (Clayton et al., 2017). Clayton (2021) discussed how these changes, food, and economic insecurity, are particularly impactful on the Inuit in Northern Canada. As a result, there is an increased prevalence of substance abuse and mental health concerns (Clayton, 2021). Climate change also has a major influence on communities that rely on agricultural production, due to reduced productivity and viability of produce (Berry et al., 2010). The rising heat also reduces the amount that agricultural labourers can physically work. These losses contribute to socioeconomic hardships and declining mental health (Berry et al., 2010).

Effects on Young People

Young people are particularly at risk for being affected by climate change (Patrick et al., 2022). Patrick et al., (2022) found that young people are more susceptible to eco-anxiety and PTSD. Similar results were found by Hickman et al., (2021) who conducted surveys on young people among 10 different countries on their opinions on climate change. They found that the majority of young people were concerned about climate change, and “59% were very or extremely worried” (Hickman et al., 2021, p. 863). Young people feel betrayed because despite not having done most of the damage to the planet, they must deal with the consequences (Hickman et al., 2021). This betrayal manifests itself in negative thoughts and mental health conditions (Hickman et al., 2021). To further explain this phenomenon, Hickman et al., (2021) referred to the stress-vulnerability model of health, which explains that exposure to chronic stress in childhood can cause lasting impacts and increase the risk of mental health struggles.

Furthermore, we see patterns of concern amongst young people regarding procreation due to fears about the future and the impact climate change may have (Clayton, 2021). A study by Schwartz et al., (2023) analyzed the effects of climate

change anxiety on adult students in the United States. In their study, they included several qualitative questions that allowed young people to express their concerns about climate change. One individual conveyed that “Even going to college and thinking of my future at times feels misguided and naïve when facing the reality that there is a large chance that I won’t be able to have children, a future or a stable career in a world that is devastated by climate change” (Schwartz et al., 2023, p. 16717). Others explained feeling like they should not bring children into the world as to not contribute to population growth (Schwartz et al., 2023). Despite the numerous stressors for young people in relation to climate change, protective factors are present as well. Hickman et al., (2021) explained that psychosocial resources such as friend and family support, coping skills, and the ability to handle stressors can mitigate the effects of climate change on the mental health of young people. The extreme worries and stress that young people experience due to climate change highlights the need for our study and its focus on students’ mental health.

Limitations

Despite current literature providing important insights into climate change and mental health, they do pose a variety of limitations. Patrick et al., (2022) and Schwartz et al., (2023) collected data during the COVID-19 pandemic in 2020, which could have contributed to increased rumination and feelings of anxiety. Due to limited distractions, individuals may also have been more exposed to negative news surrounding climate change, which could have influenced the results of the study. Individuals in Australia had also recently experienced severe bushfires, therefore, increasing the likelihood of experiencing a direct climate event and mental health symptoms (Patrick et al., 2022). Cuijpers et al., (2023) explained how it is challenging to study how climate events impact mental health, as measurements would have to occur before and after the events to determine causality. Confounding variables are also important to consider as they may have influenced the levels of mental health symptoms (Cuijpers et al., 2023). Furthermore, Hickman et al., (2021) developed a study that utilized an online polling company that required Internet access and in most cases the ability to speak English. This limits the generalisability of the study given its exclusion of non-English speaking countries. Other research studies found similar trends and difficulties in determining directional relationships, as it is not always clear whether climate change influences mental health (Schwartz et al., 2023; Stanley et al., 2023). Another possible explanation could be that poor mental health makes individuals more susceptible to having negative reactions toward climate change (Schwartz et al., 2023; Stanley et al., 2023). Despite these limitations, the discussed literature is important as it recognizes the implications of climate change and the prevalent effects on the mental well-being of young people.

Summary

The literature review provided demonstrates the immense impact of climate change on the mental health of individuals, through both direct and indirect effects. Mental health can be directly affected by experiencing extreme weather events, which can cause increased stress levels and decreased cognitive functioning (Clayton et al., 2017; Patrick et al., 2022). Climate change also negatively influences social and economic structures by making areas less habitable and decreasing food security, demonstrating

its indirect effects (Cuijpers et al., 2023). Additionally, it emphasises empirical evidence highlighting young people as a vulnerable population to the effects of climate change. Young people experience feelings of worry and powerlessness about the future and fear the potential of not having a stable career or family (Clayton, 2021; Schwartz et al., 2023). This evidence guided our research as we sought to gain a greater understanding of how students feel about climate change and whether it distracts from their studies. It also aimed to build on existing literature and push for more mental health resources to support those who are struggling with the effects of climate change.

Theoretical Frameworks

Social Identity Theory

According to Stets and Biga (2003), identity is defined as "a set of meanings attached to the self that serves as a standard or reference that guides behaviour in situations" (p. 401). Identity provides a basis for an individual's attitudes and behaviours, playing a significant role in everyday situations and social interactions. Theorists have highlighted the influence of social groups on individual identities (Stets & Biga, 2003). This has led to the conclusion that individuals define their personal identities based upon the groups they are a part of, which is the foundation of social identity theory (Islam, 2014). Social identity theory provides a foundation for environmental identity theory, which forms a basis for the study of how identities surrounding the environment can be influenced by several factors including social groups (Islam, 2014).

Social identity theory was first developed by Henri Tajfel (1970) through his work on social groups (Islam, 2014). This early work involved the use of cognitive grouping to explain how social groups differ in their biases and perceptions (Islam, 2014). Tajfel (1970) found that individuals formed psychological bonds within their groups, by having more positive evaluations of one's own group and more negative evaluations of the out-group (Islam, 2014). When one forms an identity within a group, it becomes part of their self-concept, meaning they are more emotionally tied to the values of the group (Islam, 2014). Therefore, comparisons between groups can lead members to have a positive bias towards their group to feel good about themselves and their identity (Islam, 2014).

Stets and Biga (2003) highlighted the importance of how identities are formed through the identity model. This model permits that once an identity is used within a specific situation, a feedback loop has been secured (Stets & Biga, 2003). Since individuals are composed of multiple identities due to the social groups they are a part of, each interaction involves its own feedback loop for these separate identities (Stets & Biga, 2003). A feedback loop includes three components (Stets & Biga, 2003). The first component is one's standard "self-meanings tied to their identity" (Stets & Biga, 2003, p. 402). The second component is one's reflected appraisals, in which individuals use the perceptions of others to derive a view of themselves (Stets & Biga, 2003). The third component is called a comparator and compares the standard and perceptual inputs to determine differences between them (Stets & Biga, 2003). In cases where these components are similar, individuals feel more positive emotions and confidence since others are reaffirming their standard beliefs (Stets & Biga, 2003). Therefore, they tend to

perform the behaviour that is most aligned with these positive emotions (Stets & Biga, 2003).

Social identity theory plays a vital role in understanding social groups and how individuals develop their identities based on the groups they are a part of. This theory has been applied to a variety of situations and contexts throughout the years. For example, social identity theory has been used to address concerns regarding the environment, which has led to the development of environmental identity theory (Stets & Biga, 2003).

Within our study, social identity theory has allowed us to understand how beliefs regarding climate change can be strongly influenced by one's social identity. Specifically, we argued that students' affiliation with their program of study would play a role in how they feel about climate change. Social identity theory has also provided us with a sufficient basis to understand the development of environmental identity theory, which delves into one's social understanding of the environment.

Environmental Identity Theory

Environmental identity pertains to how an individual's self-meanings are related to their interactions with the environment (Stets & Biga, 2003). An environmental identity can be considered a collective identity that provides a sense of connection and influences one's self-concept (Clayton, 2004). Environmental identities can be classified as either products or forces. They are products when they are developed from interactions with nature and social understandings of it (Clayton, 2004). On the other hand, environmental identity can be a motivating force by leading an individual to partake in behaviour relevant to the environment (Clayton, 2004). For example, having a strong environmental identity may propel an individual to understand the importance of environmental issues and take personal, social, or political action to promote more healthy behaviours (Clayton, 2004). Given that an individual's identity may be tied to the environment, this explains why an individual's mental health may be impacted when the environment is threatened.

When looking at environmental identity, it is important to consider the process by which this identity is developed. Theorists Kempton and Holland (2003) identified a three-stage process involved in environmental identity development, which includes salience, identification, and knowledge (Stapleton, 2015). Firstly, salience occurs when an individual becomes personally aware of environmental issues. Identification occurs when an individual becomes more concerned with the environment and begins taking action toward environmental concerns. Lastly, knowledge occurs when an individual becomes more knowledgeable about environmental work and an advocate for environmental issues (Stapleton, 2015).

Stapleton (2015) also identified five key aspects of identity that are important to consider when studying environmental identity. The first aspect suggests that identity is malleable over time (Stapleton, 2015). This means that individuals' identification with the environment can change throughout their lifetime. The second aspect argues that identity is tightly connected to practice (Stapleton, 2015). In the context of environmental identity, individuals must engage in environmental work to consider the environment as part of their identity. The third aspect states that identity is significantly impacted by social interactions (Stapleton, 2015). Since we are extremely influenced by

others, social interactions play a role in both environmental identity formation and maintenance. The fourth aspect indicates that identity exists on multiple levels (i.e., micro/macro) (Stapleton, 2015). Therefore, it is important to consider individual contexts which have a strong influence on how environmental identity is expressed. The fifth aspect suggests that education and schooling can heavily impact identity (Stapleton, 2015). The strength of an individual's environmental identity is immensely influenced by their knowledge of the topic (Stapleton, 2015). This speaks to the importance of including environmental issues in school curriculum.

Environmental identity was extremely important to our study since it allowed for greater insight into how individuals feel about climate change. We were able to understand how dedicated one is to the practice of environmental work and better understand their concerns within the topic. Since many of these beliefs and actions arise from one's social identity, we hypothesized that those in science-based programs would have a stronger environmental identity. This reflects our findings that students in science-based programs engage in larger amounts of environmental work, therefore, demonstrating that their identities are more strongly linked to the environment. Utilizing this theory also allowed us to delve deeper into environmental identity and sparked our interest in researching the link between environmental identity and mental well-being. This led to a shift in our study towards a greater focus on environmental identity overall.

Terror Management Theory

An additional social psychological theory that can be utilised to understand the relationships between mental well-being and our changing climate is terror management theory (TMT). TMT was developed by university students Jeff Greenberg, Sheldon Solomon, and Tom Pyszczynski (1986), who formulated the theory in attempts to outline the interrelatedness between social psychological concepts such as self-esteem, aggression, the self-concept, etc. (Van Lange et al., 2012). They emphasized that the theory was constructed to provide an integrated perspective of these concepts, and additionally wished to investigate how these concepts impacted factors such as social influence and relationships (Van Lange et al., 2012). TMT conceptualizes the impacts of our unconscious perceptions regarding our own mortality, as well as how these perceptions are integrated within our daily lives (Van Lange et al., 2012). To add, TMT explains that our behaviours and methods of coping are dictated by our perceptions and fears of our mortality.

The theory is broken down into two observations that exemplify the significance of these perceptions (Van Lange et al., 2012). The first being that individuals are embedded with a fight-or-flight system that protects them from external threats. Second, the cognitive capacity of individuals maintains that ideas surrounding mortality are present and personal, and that death may be brought upon us at any time (Van Lange et al., 2012). TMT predicts that this evolutionary fight-or-flight response predisposes us to thoughts of anxiety and distress that we must maintain the management of. More specifically, we must endure the management of feelings of anxiety, or terror, brought on by our perceptions of risk and mortality (Van Lange et al., 2012). Thus, the management of our terror is impacted by our perceptions of the state of the world and the position of our existence within it. Further, effective and positive terror management is exemplified through individuals' perspectives maintaining that one provides benefit towards the

society in which they live (Van Lange et al., 2012). One significant component of TMT is defined as Mortality Salience (MS). The concept of MS is outlined as being our perceptual awareness regarding our own future mortality, and the reality of our own death (Naidu et al., 2022). MS is an important component within terror management theory as its presence within the individual demonstrates the salience behind cognitive structures that protect us from anxiety regarding mortality (Naidu et al., 2022).

TMT and its conceptualization are built upon the hypothesis that psychological distress and functioning is a significant mediator between cultural worldviews and our self-esteem. Moreover, our abilities to manage our psychological anxieties plays a critical role in how we interpret external world occurrences, and additionally this perception impacts our self-esteem and distress (Van Lange et al., 2012). The cognitions analyzed through TMT are emphasized to act as a resilience factor within our self-esteem and well-being. Thus, perceptions of mortality are rather explained to reinforce positive self-esteem and well-being due to the protective nature of terror management (Van Lange et al., 2012). Additionally, interfering with these cognitive structures will negatively impact one's terror management, and further bolster anxiety and distress regarding perceptions of risk and mortality (Van Lange et al., 2012). Negative terror management may propel individuals to use maladaptive cognitive strategies to separate themselves from perceptions of death, and further adopt unhelpful perspectives such as minimization of the threat, avoidance, or denial (Naidu et al., 2022). To reiterate, adequate terror management is dictated through our perceptions of the world and our position within it, and this impacts the intensity of anxiety and distress within perceptions of future mortality (Van Lange et al., 2012).

Terror management theory can be utilized to understand the feelings that climate change brings upon us as humans. Occurrences of climate change have brought ideas regarding future death and mortality due to risks towards health and death, and other vulnerabilities (Naidu et al., 2022). The concept of climate change has proposed the probable consequences of intense and persistent extremities of dangerous weather events such as wildfires, floods, droughts, and more (Naidu et al., 2022). The recent and prevalent exposure to this knowledge emphasizes the presence of MS and other psychological stressors regarding thoughts of future and near mortality. This anxiety is further reinforced by portrayals from media outlets, whose content is highly influenced by marketing pressures to sell emotional and powerful stories (Naidu et al., 2022). Further, this constant exposure to information on the climate crisis may amplify thoughts of death and MS, due to the individual's thoughts regarding the inability to fix the problem themselves.

To reiterate, TMT discloses the significance behind our perceptions of the world and further how the individual plays a role within it, and that this impacts our abilities to manage feelings of anxiety and terror (Naidu et al., 2022). Naidu et al., (2022) states that events of climate change have brought feelings of powerlessness and a loss of individual control within the situation. Moreover, this sense of powerlessness brought by the external factor of climate change impacts our abilities to manage terror and anxiety. Societal reactions to events such as climate change are essential dictators of how we manage ideas regarding mortality (Naidu et al., 2022). Further, our capabilities within terror management influence means of external response (i.e., attempts of climate change mitigation) as well as the internal processes (i.e., avoidance, minimization, or

distress) (Naidu et al., 2022). To reiterate, the tenets of TMT lay some of the theoretical groundwork that may be utilized to understand relationships between climate change and mental well-being. It is clear through TMT that we can understand events of climate change as salient factors within how we manage aspects of mental well-being such as anxiety and distress (Naidu et al., 2022).

TMT was valuable to our study because it allowed us to understand the impacts of climate change on mental health and well-being. The overall premise of TMT has been used to understand how climate change plays a critical role in individuals' mental well-being, as our changing climate reinforces ideas regarding future mortality as well as overbearing feelings of powerlessness (Naidu et al., 2022). This provoked our interest in seeking to understand the feelings that may be brought to the surface when thinking about climate change. To measure participants' emotions in regard to climate change, we asked them how they felt about climate change in association to many of the feelings that arise in TMT. Specifically, we looked at how much control participants felt in regards to climate change, with many reporting that they often felt powerless and few reporting regular feelings of optimism.

Summary of Theoretical Frameworks

These theoretical frameworks have provided us with a foundation to understand how climate change influences mental well-being. This has allowed us to gain a deeper understanding of our results and the implications of climate change on university students. Social identity theory was used to understand how participants' identity with their program influences their identity regarding the environment. This in turn provided us with a basis to understand environmental identity theory. Participants' strength of environmental identity allowed us to explore their social relationship with the environment and revealed how they interact with the environment by choosing to take action to eliminate the effects of climate change. Our strong interest in this theory led to a shift in our research towards the link between environmental identity and mental well-being. Lastly, terror management theory provided us with a baseline idea of the feelings that may arise for people when thinking about climate change. This led to our interest in studying how participants felt about climate change, by asking them to report their emotions and level of anxiety associated with this global event.

Methodology

Development of Survey

Our research team consisted of six fourth-year undergraduate students in the Honours Social Psychology Program at McMaster University. This study was conducted as a part of our thesis requirement. All aspects were overseen by Dr. Sarah Clancy, the professor of our SOCPSY 4ZZ6 thesis course. Climate change and its relation to mental well-being was selected as our topic in reaction to the increasing importance of environmental protection and its social implications within recent years. Based on this topic, we were able to select two key research questions. The research questions we aimed to answer were: *How does climate change affect the mental well-being of undergraduate students*? *How do these effects differ between programs of study*?

To answer these questions, we thoroughly analyzed current academic literature on the topics of climate change, mental health, and relevant social psychological theories.

More specifically, we looked at social identity theory, environmental identity theory, and terror management theory. We utilized two existing scales designed to measure environmental identity and anxiety related to climate change. One scale was the Environmental Identity Scale (EID-R) developed by Susan Clayton, a conservation psychologist at the College of Wooster (Clayton, 2023). We additionally used the Climate Change Anxiety Scale (CCA), also created by Clayton (2023) and her collaborator, Brian Karazsia. Both scales (EID-R, CCA) were obtained from Dr. Clayton's personal website, where a statement to use the scales for free for research purposes appears (Clayton, 2023). The third scale used was the Emotions Scale, consisting of questions asked about the persistence of specific emotions and their association with climate change. Questions included in the Emotions Scale were inspired by research conducted by Hickman et al., (2021). We chose to exclude the emotions 'Helpless', 'Afraid', and 'Despair', to shorten the scale items. Additionally, three open-ended questions and six demographic questions were included in our survey.

Our research was approved by Dr. Sarah Clancy, who acted as the McMaster Research Ethics Board (MREB#: 0327) reviewer, on November 8, 2023. Research on our chosen topic was carried out through an anonymous, online survey on LimeSurvey. LimeSurvey was approved by the McMaster Research Ethics Board for survey research in our class, SOCPSY 4ZZ6. This program was ideal as their platform allows participants to remain anonymous and protects participant data behind encrypted, password-protected software. Participants were encouraged to complete our survey in a safe, secure location, to maintain their privacy. This survey included both open and closed-ended questions.

Ethical Concerns

As per the MREB, participants may have experienced social and/or psychological risks as a result of participating in our study. However, we introduced mitigation strategies to ensure that these risks did not exceed any that may be encountered in everyday life. One possible psychological risk present in our survey revolved around the disclosure of sensitive information. The questions used in our survey assessed negative emotions, overall mental well-being, and personal experiences. Disclosing this type of information may have made participants feel embarrassed, uncomfortable, worried, or upset. To reduce this risk, we included wellness resources in the letter of information in the case that any negative feelings were to arise. The content of our survey was also disclosed in the letter of information. This way, participants were immediately informed of the risks they may face when disclosing sensitive information. Additionally, participants had the right to skip questions and/or exit the survey, for any reason, at any point before completion. All these precautions limited the development of negative psychological risks to survey respondents by offering transparency and relevant support.

Additionally, it is important to acknowledge that there may have been social risks to participants. It is possible that if the survey was completed in a public space, their answers may have been visible to others, resulting in a potential loss of privacy. To add, identity may have been revealed if participants liked or responded to a social media recruitment post about our survey. To maintain the privacy and anonymity of our

participants we used an online anonymous survey which ensured that data was only accessible to members of our research team. Additionally, data was stored on the MREB-approved program LimeSurvey, whose software is secure, encrypted, and password-protected. Another mitigation strategy we implemented was suggesting, in the letter of information, that participants complete the survey in a place where they feel most comfortable. This allowed participants to choose their own space to share their answers, ultimately promoting privacy. Moreover, after completing the write-up of our study, we deleted all participant data. Overall, the social and psychological risks in disclosing sensitive information posed no greater risk than issues faced in everyday life.

Another potential ethical concern was that the six researchers involved in this project are of the same demographic as the participant group; both consist of undergraduate students at McMaster University. Furthermore, four of our researchers were employed by the university as Teaching Assistants at the time of recruitment. To reduce conflict of interest, researchers did not ask any individual they have a personal relationship with to complete the survey or post the survey on any personal social media accounts. Additionally, the researchers did not personally contact any MSU clubs or societies they are a member of, past or present. Researchers who were Teaching Assistants at the time of recruitment did not ask any of their students to complete the survey. The survey was solely distributed through McMaster academic societies, MSU clubs, and MSU bulletin boards located on the university's campus. This limited researchers' influence on survey results by using third-parties to distribute the survey.

Recruitment

Participants were recruited through email contact with McMaster Students Union (MSU) clubs by Abby Pomeroy, student-led academic societies by Vishmini Jayatunge, and through MSU-approved physical posters posted on MSU bulletin boards. We asked both MSU clubs and student-led societies to distribute our survey to their members, through either email communication or posting on social media. Posters located on MSU bulletin boards were distributed across a variety of buildings on McMaster University's campus by the McMaster Underground Media. Participants who found our study through physical posters were recruited using convenience sampling.

We selected clubs on the MSU website by choosing every 8th club listed on the clubs' directory through randomized sampling. The list of clubs contacted is as follows: Amnesty International McMaster, Assyrian Chaldean Syriac Student Union (ACSSU), Black Aspiring Physicians of McMaster Association, Canadian Obesity Network Students and New Professionals (CON SNP McMaster), Cornerstone Adventist Christian Fellowship (Cornerstone ACF), Financial Marauder, Health Equity and Advocacy in Science (HEAS), Indus Development Foundation McMaster (IDF McMaster), Korean Culture and Language Club (KCLC), Mac ProcrastiKnitters, MacDonates, McMaster Advanced Space Systems (MASS), McMaster Artificial Intelligence Society, McMaster Brain Injury Association (MBIA), McMaster Champions of Change (Champions of Change Mac), McMaster Culture Connect (MCC), McMaster Extra Life, McMaster German Cultural Club, McMaster Gujarati Students Association, McMaster Indigenous Health Movement, McMaster Japanese Connection (MJC), McMaster Malayalee Student Association (MMalSA), McMaster MOOD FM, McMaster Out of Province Association (MOPA), McMaster Pre-Dental Club, McMaster Rare

Disease Review, McMaster Somali Society, McMaster Students Cooking on a Budget, McMaster Turkish Students Association (MTSA), McMaster Women in Pre-Law Society (WIPS), Midnight Association, North American Young Generation in Nuclear McMaster Chapter, Pediatric Mental Health Initiative (PMHI), RUYA McMaster, Society of Off-Campus Students (SOCS), Students for Wishes McMaster, The Citizens Foundation, The Lift Club, Trek for Teens McMaster, and World University Service of Canada (WUSC) McMaster.

We also selected all student-led academic societies running at McMaster University through convenience sampling. The list of societies contacted is as follows: Bachelor of Health Sciences Society, Bachelor of Technology Association, Bio-Psych Society, Biology Society, BioPharm Society, Chemical Engineering Club, Civil Engineering Society, Communications & Media Arts Society, Computer Science Society, DeGroote Commerce Society, Electrical and Computer Engineering Society, Engineering and Society Students Association, Health, Aging & Society Student Association, iBioMed Society, iSci Student Society, Justice, Political Philosophy and Law (JPPL) Society, Kinesiology Society, Life Sciences Student Society, Math & Stats Society, McMaster Actuarial Society, McMaster Anthropology Society, McMaster Biochemistry and Biomedical Sciences Society, McMaster Economics Society, McMaster Engineering and Management Society, McMaster Engineering Society, McMaster Human Behaviour Society, McMaster Humanities Society, McMaster Labour Studies Student Association, McMaster Materials Science & Engineering Society, McMaster Mechatronics Society, McMaster Neuroscience Society, McMaster Philosophers' Society, McMaster Political Science Students Association, McMaster Science Society, McMaster Social Sciences Society, McMaster Society of Mechanical Engineering, McMaster Sociology Student Society, McMaster Undergraduate History Society, McMaster Undergraduate Physics Society, McMaster Undergraduate Society for the Chemical Sciences, Psych Society, School Of Earth, Environment, & Society Student Association, Social Psychology Society, Social Work Students Collective, Society of Arts & Science, Students Society Culture and Religion Scholars, Software Engineering Society, and StratComm.

Email communication with clubs and societies included the letter of information, relevant recruitment scripts, and the link to our survey. Physical posters were designed in consideration of the supervisor-approved poster template. Posters also included a summary of our study and a QR code linked to our survey.

Communication with clubs and societies were conducted by one of the student investigators on the project, provided that the student investigator had no relationship with the club or society they were contacting. All participants in our study were undergraduate students at McMaster University, over the age of 18 years.

Survey Procedure

Upon clicking the link and entering the survey, participants first saw the letter of information, which included an outline of the purpose of our study, disclosure of the estimated 10-15 minutes required for full completion, examples of a few of our included questions, and any ethical concerns related to survey completion. After reading the letter of information, participants could then decide if they wanted to participate in our study. By agreeing to participate, we received implied consent. All participants had the right to withdraw from completing the survey at any point up until they pressed submit.

The first page of the survey consisted of the Environmental Identity Scale (EID-R), developed by Dr. Clayton (Clayton, 2023). This scale consisted of 14 elements which assessed participants' feelings and connections to the natural environment. Next, participants completed the Climate Change Anxiety Scale (CCA), also created by Clayton and her collaborator, Bryan Karazsia (Clayton, 2023). This scale had 13 elements that evaluated feelings of anxiety in relation to climate change. After this, participants completed the Emotions Scale, where they were asked about the persistence of specific emotions and their association to climate change. The 11 elements included in the Emotions Scale were inspired by research conducted by Hickman et al., (2021). The next page had 3 open-ended questions, giving participants the opportunity to state their opinions in their own words. An example of an open-ended question that was used in our survey is "If any, what kind of actions do you take to address climate change?" Lastly, participants were asked 6 demographic questions. Upon completion of the survey, participants were invited to our poster session, where we presented our findings. Data was collected anonymously and was stored on the LimeSurvey platform website and was only accessible to members of our research team.

Data Collection

Our survey opened on November 13, 2023, after receiving MREB approval from Dr. Sarah Clancy, and closed on February 16, 2024. Our target number of responses from participants was 100. The total number of responses ended up being 231. However, of these responses, 191 were incomplete. Therefore, we received a total of 37 complete responses. 1 of these responses came from a graduate student, therefore, was ineligible for inclusion in this study. Additionally, 4 students filled out over three-quarters of the survey, which made their responses eligible for analysis. Therefore, the total number of eligible responses was 40 (n = 40).

A major challenge that arose during our data collection was survey completion. The questions we included in our survey may have felt long in duration to participants. This may have reduced their motivation to complete the survey, leading to incomplete responses. Out of the 231 received responses, 191 of these responses were incomplete. Almost all of these incomplete responses did not respond to any questions that were past the consent to participate. Additionally, the vast majority of MSU clubs and student-led societies did not respond to our emails, which significantly hindered distribution and student participation. One of the only societies that posted our study on their social media accounts was the Social Psychology Society. This may have affected the variety of programs of study that our participating students came from. Another challenge was the number of participants. We hoped to reach our goal of 100 participants, however, this was difficult as our sample consists of undergraduate students, who may not have enough time and/or incentive to complete our survey. Undergraduate students have busy schedules and this may have affected the number of students that participated in our study. We reached out to many clubs to increase the possibility of prospective participants and full completion of the survey. Lastly, our survey was only active for a three-month period. It was not possible to have it active for longer due to time constraints for the completion of our thesis. This may have affected the total number of participants.

Data Analysis

Quantitative data was inputted and analyzed using Jamovi software. Both descriptive and inferential statistics were used. Descriptive statistics provided a description of various features of the data through generating a summary. We then re-labelled this data for computational purposes. Additionally, some of the data was re-coded in order to properly conduct certain tests. The output of descriptive statistics were frequency tables that listed the quantity of each response set. Means were then computed for each variable to conduct inferential statistical tests. Inferential statistical tests that were utilized were correlations, t-tests, and chi-squares. Correlational matrices were used to identify statistical significance, and whether this correlation was positive or negative. Statistical significance was found when the p-value was less than 0.05. T-tests were used to identify the means of participants across various programs of study. Chi-square tests (contingency tables) were used to identify statistical significance between two variables.

Qualitative data from LimeSurvey was exported into a Microsoft Excel spreadsheet. Thematic analysis was used to analyze our three open-ended survey questions, and we used an inductive codebook approach to code this data. This was done by going through the first 10 individual responses to the open-ended questions, identifying themes based on the content, and applying these themes to the remaining responses. We then utilized axial coding by developing major themes through the themes identified through the inductive codebook approach. Lastly, we created a chart that included the three open-ended questions, major themes for each question, and the frequency of each theme.

Data Collection and Analysis Timeline

Task	Start Date	End Date
Proposal submission	October 19, 2023	October 19, 2023
Working on proposal revisions	November 1, 2023	November 8, 2023
Ethics approval received	November 8, 2023	November 8, 2023
Recruitment of participants	November 13th, 2023	February 16, 2024

Data collection	November 13th, 2023	February 16, 2024
One-to-two-page overview of the research project	November 17, 2023	November 17, 2023
Data analysis	February 17, 2024	March 2, 2024
Draft poster submission	March 4, 2024	March 4, 2024
Poster revisions	March 4, 2024	March 7, 2024
Final poster submission	March 7, 2024	March 7, 2024
Final paper preparation	March 10, 2024	March 27, 2024
Poster presentation	March 20, 2024	March 20, 2024
Final paper submission	March 28, 2024	March 28, 2024

Summary

Research was conducted by six undergraduate students at McMaster University. Randomized and convenience sampling methods were used. The survey was distributed through email communication to academic societies and MSU clubs, and through physical posters on MSU bulletin boards. The survey opened on November 13, 2023, and closed on February 16, 2023.

Ethical concerns were minimal. We disclosed any psychological risks in our letter of information, prior to the commencement of the survey. Supportive resources were also included, in case any negative feelings emerged during completion. As the researchers

involved in this study are of the same demographic as the participants, researchers did not contact any persons, clubs, or societies they may have a relationship with. All participants had the right to withdraw from completing the survey, at any point, up until they press submit. Participants were encouraged to complete our survey in a safe location, to maintain their privacy.

The research process included designing a survey in consideration of current efforts in conservation psychology and a thorough review of existing literature on social psychology, climate change, and mental well-being. We then carried out our survey through the MREB-approved platform, LimeSurvey. We used both closed-ended, quantitative scales and open-ended questions to gather data. To uphold the privacy and anonymity of our participants, data was only accessible to members of our research team, and stored behind password-protected technology. The total number of eligible responses was 40. Data was analyzed using Microsoft Excel and Jamovi.

Results

Sociodemographics

A total of 40 McMaster University Undergraduate students participated in our study (*n* = 40). The final 6 items in our survey consisted of a variety of demographic questions including gender, age, ethnicity, year of study, faculty, and program of study. It is important to mention that not all participants responded to these items, but their responses were included if they responded to at least 75% of the survey. These questions were all open-ended, allowing participants to freely type in their answer of choice. To improve organization, responses were grouped together into appropriate categories (e.g. ‘Woman’ was grouped with ‘Female’). For gender, 25 participants self-identified as female (78.1%), 6 participants self-identified as male (18.8%), and 1 participant self-identified as non-binary (3.1%). The mean age of our participants was 20.7, with 9 reporting the age of 22 (27.3%), 8 reporting the age of 21 (24.2%), 5 reporting the age of 20 (15.2%), 4 reporting the age of 19 (12.1%), 4 reporting the age of 18 (12.1%), and 3 reporting the age of 23 (9.1%). For ethnicity, 18 participants self-identified as White/Caucasian/European (58.1%), 6 participants self-identified as Multiethnic (19.4%), 2 participants self-identified as South Asian (6.5%), 2 participants self-identified as Canadian (6.5%), 1 participant self-identified as Indian (3.2%), 1 participant self-identified as Asian (3.2%), and 1 participant self-identified as Chinese (3.2%).

With regards to year of study, there were 15 participants in their 4th year (44.1%), 6 participants in their 3rd year (17.6%), 6 participants in their 1st year (17.6%), 5 participants in their 2nd year (14.7%), and 2 participants in their 5th year (5.9%). 13 of our participants were from the Faculty of Social Sciences (38.2%), 12 were from the Faculty of Science (35.3%), 4 were from the Faculty of Engineering (11.8%), 2 were from the DeGroote School of Business (5.9%), 2 were from the Faculty of Health Sciences (5.9%), and 1 was from the Faculty of Humanities (2.9%). Participants came from a variety of programs, which we decided to organize into the categories ‘science-based’ and ‘non-science-based’. This was done to conduct calculations to determine the influence of our moderator ‘program of study’, which hypothesized that participants in more science-based programs would have a stronger identity with the environment and more negative feelings about climate change. We determined that

programs in the Faculty of Social Sciences, the Faculty of Sciences, and the Faculty of Health Sciences were considered to be 'science-based', and programs in the Faculty of Engineering, the Faculty of Humanities, and DeGroote School of Business were considered to be 'non-science-based'. There were a total of 27 participants in science-based programs (79.4%), and 7 participants in non-science-based programs (20.6%).

Feelings Towards Climate Change

Table 1 demonstrates the average amount respondents felt different emotions towards climate change. The emotion that respondents experienced the most was powerless with a mean score of 3.75.

Table 1

Means and Standard Deviations for Feelings Towards Climate Change

	Mean	Median	SD
Sad	2.95	3.00	1.06
Powerless	3.75	4.00	1.06
Anxious	2.88	3.00	1.34
Optimistic	2.15	2.00	0.92
Angry	2.88	3.00	1.28
Guilty	2.73	3.00	1.15
Ashamed	2.05	2.00	1.06
Hurt	2.27	2.00	1.32
Depressed	2.23	2.00	1.17
Grief	2.27	2.00	1.26
Indifferent	2.17	2.00	1.22

Lack of Control

Tables 2 and 3 illustrate the frequencies of respondents feeling powerlessness and optimism towards climate change. Figure 1 highlights how 40% (n = 16) of respondents often felt powerless towards climate change in comparison to 10% (n = 4) of respondents who often felt optimistic.

Table 2

Frequencies of Feelings of Powerlessness

	Counts	% of Total	Cumulative %
Never	2	5.0	5.0
Rarely	2	5.0	10.0
Sometimes	10	25.0	35.0
Often	16	40.0	75.0
Always	10	25.0	100.0

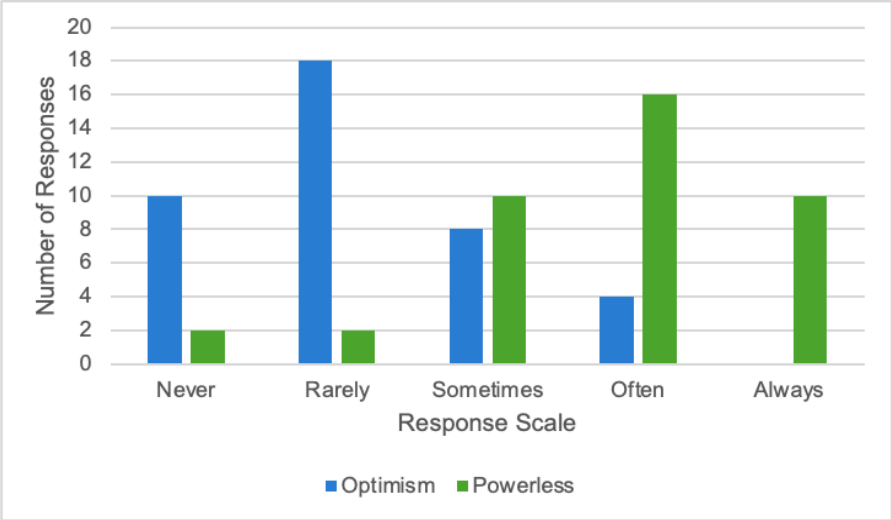
Table 3

Frequencies of Feelings of Optimism

	Counts	% of Total	Cumulative %
Never	10	25.0	25.0
Rarely	18	45.0	70.0
Sometimes	8	20.0	90.0
Often	4	10.0	100.0
Always	0	0.0	0.0

Figure 1

Frequencies of Feelings of Optimism and Powerlessness



For the remainder of our calculations, we chose to exclude feelings of optimism and indifference, and primarily focus on negative feelings towards climate change. This is because the key focus throughout our thesis was to look at whether climate change negatively influences mental well-being. Feelings of optimism and indifference do not accurately represent this and therefore were excluded from these calculations.

Re-coded Means and Frequencies

The means for negative feelings towards climate change, climate anxiety, and environmental identity were all re-coded and separated based on extreme opinions (low, average, strong). This allowed us to transform this data into categorical variables to analyse whether this data was moderated by program of study. This was done by forming contingency tables in Jamovi. Table 4 demonstrates the means and frequencies found based on these groupings. These values demonstrate that most respondents experience average amounts of negative feelings towards climate change (42.5%), strong environmental identity (65.0%), and low amounts of climate anxiety (87.5%).

How does climate anxiety influence negative mental well-being surrounding climate change?

Table 5 demonstrates the correlation between climate anxiety and negative feelings towards climate change. Climate anxiety was positively correlated with negative feelings

towards climate change (r = .68, p <.001). The p-value was less than .05, indicating this is a significant correlation. This demonstrates that increased climate anxiety significantly influences negative feelings toward climate change. Figure 2 displays this significant positive correlation. This finding supports our hypothesis since it demonstrates that

Table 4

Re-coded Frequencies and Means

	Counts	% of Total	Cumulative %	Mean
Negative Feelings				2.55
Low	16	40.0	40.0	
Average	17	42.5	82.5	
Strong	7	17.5	100.0	
Environmental Identity				4.30
Low	0	0.0	0.0	
Average	14	35.0	35.0	
Strong	26	65.0	100.0	
Climate Anxiety				1.30
Low	35	87.5	87.5	
Average	4	10.0	97.5	
Strong	1	2.5	100.0	

Table 5

Climate Anxiety x Negative Feelings Correlation Matrix

		Climate anxiety	Negative feelings
Climate Anxiety	Pearson's r	—	
	p-value	—	
Negative Feelings	Pearson's r	0.680	—
	p-value	<.001	—
Mean		1.68	2.67
SD		0.67	0.93

increased anxiety towards climate change is associated with poorer mental well-being or increased amounts of negative feelings towards climate change.

How is environmental identity related to negative mental well-being surrounding climate change?

The correlation matrix shown in Table 6 measures the correlation between environmental identity and climate anxiety. Environmental identity was positively correlated with climate anxiety (r = .42, p = .007). The p-value was less than .05, indicating that this was a significant correlation. This demonstrates that increased environmental identity has a positive effect on climate anxiety. Figure 3 displays this significant positive correlation.

Figure 2

Climate Anxiety x Negative Feelings Correlation

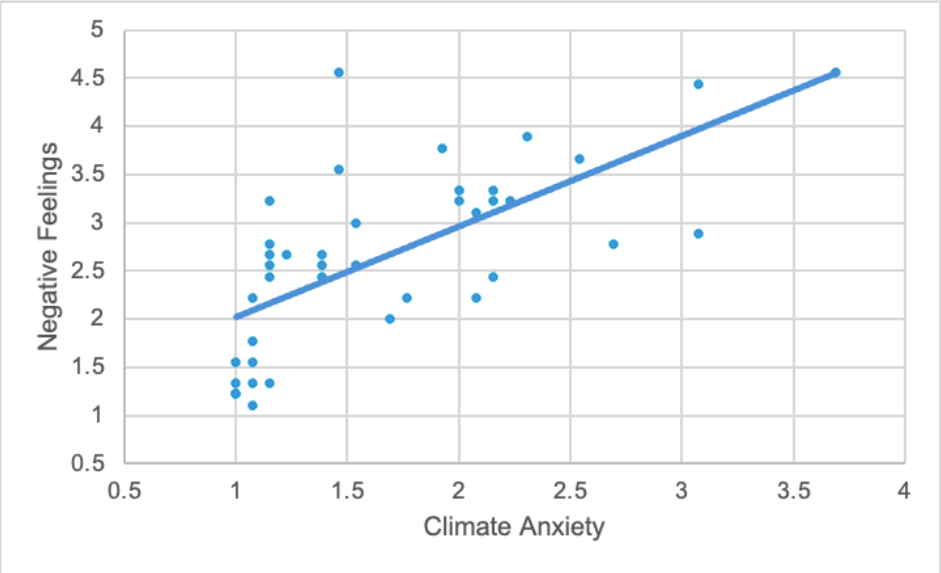


Table 6

Environmental Identity x Climate Anxiety Correlation Matrix

		Environmental Identity	Climate Anxiety
Environmental Identity	Pearson's r	—	
	p-value	—	
Climate Anxiety	Pearson's r	0.418	—
	p-value	0.007	—
Mean		5.62	1.68
SD		0.92	0.67

The correlation matrix shown in Table 7 measures the correlation between environmental identity and negative feelings toward climate change. Environmental identity was positively correlated with negative feelings towards climate change (r = .64, p < .001). The p-value was less than .05, indicating that this was a significant correlation. This demonstrates that environmental identity has a positive effect on negative feelings towards climate change. Figure 4 clearly displays this significant positive correlation.

Figure 3

Environmental Identity x Climate Anxiety Correlation

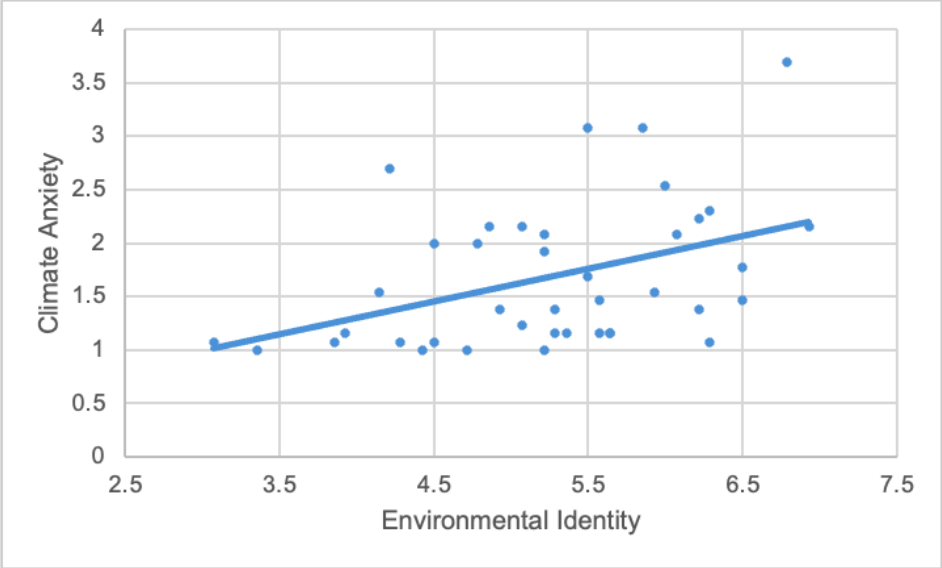


Table 7

Environment Identity x Negative Feelings Correlation Matrix

		Environmental Identity	Negative Feelings
Environmental Identity	Pearson's r	—	
	p-value	—	
Negative Feelings	Pearson's r	0.642	—
	p-value	<.001	—
Mean		5.62	2.67
SD		0.92	0.93

How is program of study associated with mental well-being surrounding climate change?

Table 8 demonstrates the results of a t-test performed to compare the climate anxiety of students in science-based programs to those in non-science-based programs. Students in science-based programs were higher in climate anxiety (M = 1.69, SD = .60) than students in non-science-based programs (M = 1.29, SD = .27), $t(32)$ = 1.71. However, these results were not significant (p = .096).

Figure 4

Environmental Identity x Negative Feelings Correlation

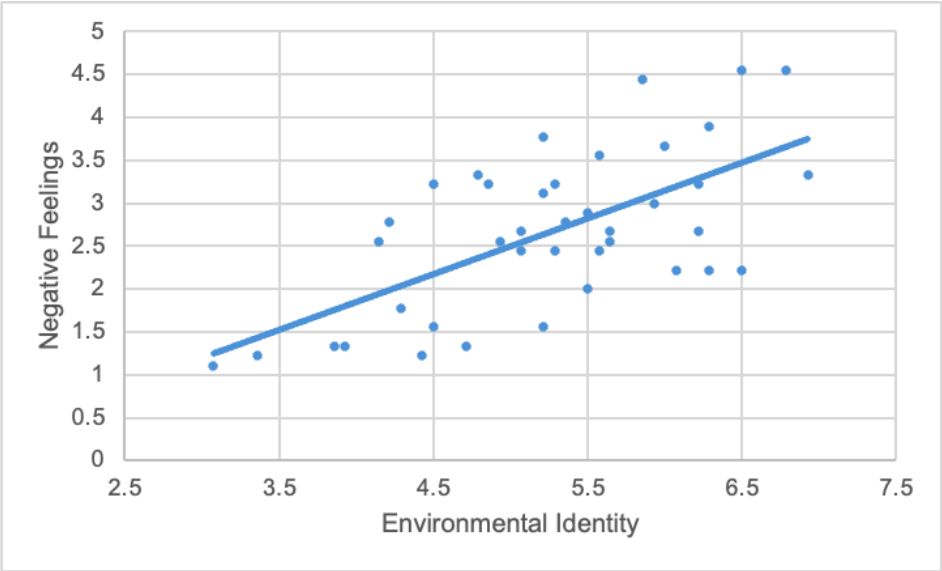


Table 8

Program-Specific Results of the T-Test

	Statistic	df	p-value	Program	Mean	SD	SE
Climate Anxiety	1.71	32.0	0.096	–	–	–	–
				Science-based Programs	1.69	0.599	0.115
				Non-science-based Programs	1.29	0.265	0.100

Table 9 demonstrates the results of a t-test performed to compare the negative feelings toward climate change of students in science-based programs to those in non-science-based programs. Students in science-based programs were higher in negative feelings towards climate change (M = 2.77, SD = .94) than students in non-science-based programs (M = 2.10, SD = .62), $t(32)$ = 1.80. However, these results were not significant (p = .081).

The following table (Table 10) is a contingency table highlighting whether the observed frequencies of negative feelings towards climate change based on program type differed from expected frequencies. We hypothesized that students in science-based programs would experience higher levels of negative feelings toward climate change compared to those in non-science-based programs. Students in a science-based program were more likely to experience strong amounts of negative feelings towards climate change than students in a non-science-based program (100% vs 0%, respectively), $X^2(2) = 2.11$ (refer to Table 10 & 11). However, these results were not significant ($p = .349$).

How is program of study associated with environmental identity?

Table 12 demonstrates the results of a t-test performed to compare the environmental identity of students in science-based programs to those in non-science-based programs. Students in science-based programs were higher in environmental identity (*M* = 5.27, *SD*

Table 9

Program-Specific Results of the T-Test

	Statistic	df	p-value	Program	Mean	SD	SE
Negative Feelings	1.80	32.0	0.081	-	-	-	-
				Science-based Programs	2.77	0.939	0.181
				Non-science-based Programs	2.10	0.623	0.236

Table 10

Science Program x Negative Feelings Contingency Table

Negative Feelings – Extreme Opinions		Science Program: Yes	Science Program: No	Total
Low	Observed	10	4	14
	% within row	71.4%	28.6%	100.0%
	% within column	37.0%	57.1%	41.2%
	% of total	29.4%	11.8%	41.2%
Average	Observed	11	3	14
	% within row	78.6%	21.4%	100.0%
	% within column	40.7%	42.9%	41.2%
	% of total	32.4%	8.8%	41.2%

Strong	Observed	6	0	6
	% within row	100.0%	0.0%	100.0%
	% within column	22.2%	0.0%	17.6%
	% of total	17.6%	0.0%	17.6%
Total	Observed	27	7	34
	% within row	79.4%	20.6%	100.0%
	% within column	100.0%	100.0%	100.0%
	% of total	79.4%	20.6%	100.0%

= .76) than students in non-science-based programs (*M* = 4.95, *SD* = 1.28), *t*(32) = 0.86. However, these results were not significant (*p* = .394).

The following table (Table 13) is a contingency table highlighting whether the observed frequencies of environmental identity based on program type differed from expected frequencies. Students in a science-based program were more likely to experience stronger amounts of environmental identity than students in a non-science-based

Table 11
X^2 Tests

	Value	df	p
X^2	2.11	2	0.349
N	34		

Table 12
Program-Specific Results of the T-Test

	Statistic	df	p-value	Program	Mean	SD	SE
Environmental Identity	0.864	32.0	0.394	–	–	–	–
				Science-based Programs	5.27	0.761	0.146
				Non-science-based Programs	4.95	1.28	0.486

program (81.8% vs 18.2%, respectively), $X^2(1) = 0.221$ (refer to Tables 13 & 14). However, these results were not significant (*p* = .638).

Qualitative Results

The qualitative portion of our survey included three open-ended questions that inquired about personal attitudes, behaviours, and program implications based on feelings toward climate change. These questions were: “Which aspects of climate change worry you the most?”, “If any, what kind of actions do you take to address climate change?”, and “How does your program of study reflect your feelings towards climate change?”. Responses

Table 13

Science Program x Environmental Identity Contingency Table

Environmental Identity – Extreme Opinions		Science Program		
		Yes	No	Total
Average	Observed	9	3	12
	% within row	75.0%	25.0%	100.0%
	% within column	33.3%	42.9%	35.3%
	% of total	26.5%	8.8%	35.3%
Strong	Observed	18	4	22
	% within row	81.8%	18.2%	100.0%
	% within column	66.7%	57.1%	64.7%
	% of total	52.9%	11.8%	64.7%
Total	Observed	27	7	34
	% within row	79.4%	20.6%	100.0%
	% within column	100.0%	100.0%	100.0%
	% of total	79.4%	20.6%	100.0%

Table 14

X^2 Tests

	Value	df	p
X^2	0.221	1	0.638
N	34		

were coded utilizing an inductive codebook approach, and axial coding was used to interpret and extract themes from these responses. For each question, we analyzed the first 10 responses to develop subordinate themes, and then used these themes to apply them to subsequent responses. It is important to note that frequencies of subordinate themes do not add up to our total sample size, as responses were often coded within multiple themes.

1. "Which aspects of climate change worry you the most?"

For our first qualitative question, "Which aspects of climate change worry you the most?", we analyzed and interpreted 30 responses (*n* = 30). Ultimately, we identified two major themes: 1) *Individualised Concerns*, and 2) *Systemic Concerns*. These themes and corresponding subordinate themes are outlined in Table 15 below.

Individualized Concerns

Environmental Anxiety

Many participants explained their anxiety with climate and the natural environment to be the most salient aspect of their worries regarding climate change. One participant explained:

> "I worry that the natural places that I enjoy and have connections to (like forests, provincial parks) will not survive climate change … More broadly, I worry about the suffering that climate change has/will have around the world and the global conflict that it may create."

Table 15

Major and subordinate themes identified

Major Themes	Subordinate Themes	Responses (*n* = 30)
Individualised Concerns	• Environmental anxiety	*n* = 16 (53.3%)
	• Future generations	*n* = 13 (43.3%)
	• Quality of life	*n* = 10 (33.3%)
Systemic Concerns	• Power imbalances	*n* = 8 (26.7%)
	• Economic prioritisation	*n* = 5 (16.7%)
	• Urgency	*n* = 2 (6.7%)
	• Communal guilt	*n* = 2 (6.7%)
	• Limited resources	*n* = 1 (3.3%)

Future Family and Generations

Another prominent concern that was revealed by participants was the implications of climate change on future family members and generations to come after.

Quality of Life

Participants also expressed that they held an overall concern regarding the ambiguity of quality of life in the future. One participant explained a major concern of theirs being:

> "The fact that it feels like it is our responsibility to fix this problem that has been created for us. We experience a quality of life brought to us by high emissions."

Systemic Concerns

Power Imbalances

An additional aspect that concerned many participants were feelings of powerlessness and perspectives of systemic imbalances of power between system and the individual. One participant's concern revolved around:

"The idea that in order to make effective change the government must be involved but it always seems like governments don't want to commit to solutions."

Economic Prioritisation

Some participants also expressed concerns regarding the prioritising of higher systems, and their worry was facilitated by their choices to prioritise economic gains over environmental interventions.

2. "If any, what kind of actions do you take to address climate change?"

We identified two major themes for our second question, "If any, what kind of actions do you take to address climate change", using the 29 (n = 29) complete responses received. These themes were: 1) *Individual Lifestyle Changes*, and 2) *Awareness and Accountability*. Themes and their corresponding subordinate themes are outlined in Table 16.

Table 16

Major and subordinate themes identified

Major Themes	Subordinate Themes	Responses (n = 29)
Individual Lifestyle Changes	• Altering transportation	n = 13 (44.8%)
	• Responsible disposal practices	n = 10 (34.5%)
	• Sustainable consumerism	n = 8 (27.6%)
	• General lifestyle alterations	n = 4 (13.8%)
	• Dietary changes	n = 3 (10.3%)
		n = 4 (13.8%)
Awareness and Accountability	• Spreading awareness	n = 2 (6.9%)
	• Policy change	n = 1 (3.4%
	• Holding others accountable	n = 1 (3.4%)
	• Educating Oneself	

Individual Lifestyle Changes

Altering Transportation

Many participants expressed that the actions they took in respect to climate change involved altering their personal behaviours around sustainable transportation practices. One participant explained:

"[I am] trying to reduce carbon emission by walking/carpooling."

Responsible Disposal Practices

Additionally, participants explained their personal attempts towards mitigating climate change as adopting more sustainable and responsible practices regarding recycling and amounts of garbage waste.

Awareness and Accountability

Spreading Awareness

Some students expressed that their efforts in the climate change crisis revolved more around educational and system barriers that coincide with the issue. One participant explained:

> "Sometimes attending protests, understanding and reading about climate change in relation to decolonization."

Policy Change

A few participants mentioned that they make efforts in attending protests, and engage in other activities targeted to adjust and push policy changes.

3. "How does your program of study reflect your feelings towards climate change?"

We had 29 (*n* = 29) adequate responses for our third qualitative question. These responses provided us with 2 overarching themes, which were: 1) *Educational Implementation*, and 2) *Program Implications on Emotions*. Major themes for this question, as well as corresponding subordinate themes, are outlined in Table 17.

Table 17

Major and subordinate themes identified

Major Themes	Subordinate Themes	Responses (*n* = 29)
Educational Implementation	• Educational recognition	*n* = 16 (55.2%)
	• Educational neglect	*n* = 11 (37.9%)
Program Implications on Emotions	• Guilt	*n* = 3 (10.3%)
	• Environmental anxiety	*n* = 2 (6.9%)
	• Feelings of economic prioritisation	*n* = 2 (6.9%)
	• Resentment	*n* = 1 (3.4%)

Educational Implementation

Educational Recognition

Many participants claimed that their programs of study reflected their feelings regarding climate change, and were adequate in acknowledging the implications of the matter. One participant claimed:

> "[My program] heavily reflects it. I study environmental sciences which has allowed me to learn a lot more about climate change, what the problems are, and what possible solutions can be."

Educational Neglect

Contrasting to the previous theme, participants additionally explained that their program's portrayals of climate change and adjacent topics are contradicting their personal perspectives regarding climate change. One participant mentioned:

> "Computer Science does not reflect my stance on climate change very well, as computer science culture can be very consumerist and wasteful."

Program Implications on Emotions

Guilt

Some participants explained that their studies enhanced their awareness regarding personal and societal guilt. One participant mentioned:

> "... An aspect that would be explored is the guilt we feel with the part we play in climate change and if we as a population are willing to make changes that might cause us discomfort in order to help alleviate the effects of climate change."

Environmental Anxiety

Other participants expressed that discussions of the climate crisis in their studies amplified their thoughts of anxiety regarding the state of the environment and the implications of climate change. One participant claimed:

> "I take a lot of environment and society courses and life sciences courses focused on the environment I reflect about this often."

Feelings of Economic Prioritisation

Similar to findings reflected in the first question, overall worry regarding governments and how choices consistently prioritize economic gains reappeared as a concern to some participants.

Discussion

Feelings Towards Climate Change

Our overall research supported previous literature regarding emotional well-being, and how climate change brought negative implications on students' well-being. This was initially found through our quantitative data, which emphasized that most participants experienced average levels of negative feelings toward climate change. However, when reporting specific emotions, 35% of participants reported feelings of powerlessness "often" compared to 45% of participants that reported "rarely" feeling optimistic (refer to Tables 2 & 3). This finding was expected as it aligns with the literature from Naidu et al., (2022) which stated that climate change events can elicit feelings of powerlessness. We also observed this theme of powerlessness within our qualitative data, specifically relating to power imbalances. While observing the systemic-based worries of our participants, power imbalances between government and public were the most frequently emphasized systemic worry. Participants also reported fear for future

generations, expressing worry that climate change issues will impact future generations (refer to Table 15).

These findings regarding feelings of powerlessness among participants can be supported by terror management theory and existing research (Clayton et al., 2017; Hickman et al., 2021). Firstly, our findings align with TMT, as feelings of powerlessness regarding climate change issues can bolster fears of mortality (Van Lange et al., 2012). Since individuals are concerned about the lack of attention from powerful systems, this can promote feelings of powerlessness. This negative impact on one's terror management can then increase anxiety and distress regarding perceptions of mortality (Van Lange et al., 2012). This theme of powerlessness can be further understood through existing literature. Clayton et al., (2017) suggest that feelings of powerlessness could be attributed to the lack of control that individuals may perceive concerning the future of the environment. The perception of climate change issues being out of one's control can be observed in our participants' responses concerning the lack of initiative that those in power are taking to address this significant environmental issue (refer to Table 15). This theme also aligns with existing literature from Hickman et al., (2021) which indicates that young people feel betrayed as they must deal with environmental consequences despite not contributing to the problem as greatly. Overall, the frequency of powerlessness in undergraduate students could be attributed to the burdens they face regarding the current state of the environment.

Climate Anxiety

To measure climate anxiety we included a scale in our survey which examined both cognitive and functional impairment. Although we found that most respondents experienced low amounts of climate anxiety, we were able to find a significant positive correlation between climate anxiety and negative feelings toward climate change (r = .68, p <.001). This suggests that increased anxiety towards climate change is associated with increased negative feelings and poorer well-being, as predicted in our hypothesis.

Students also reported experiencing climate anxiety within our qualitative results. When participants were asked to voice which aspects of climate change they found most worrying, more than half of individuals expressed concerns regarding the overall state of the environment and the preservation of natural resources (refer to Table 15). This aligns with the research performed by Hickman et al., (2021) who also found that the majority of their respondents expressed significant worry about climate change. Our results surrounding climate anxiety also support the findings of Patrick et al., (2022) which indicated that young people are at higher risk for being influenced by eco-anxiety due to perceived effects on their future. Despite low reports of climate anxiety based on our quantitative scale, qualitative results highlighted significant experiences of climate anxiety. This emphasizes a dissonance between the climate anxiety scale items and participants' subjective experiences, demonstrating a limitation of our study design.

Environmental Identity

Environmental identity and its impact on well-being became a significant point of interest throughout our research process, differing from our original main focus. First, we were able to determine a statistically significant positive correlation between

environmental identity and climate anxiety (r = .42, p = .007). This positive correlation suggests that the more an individual incorporates the environment into their self-identity, the more anxiety they will experience in response to environmental crises. Another statistically significant finding we found was a positive correlation between environmental identity and negative feelings toward climate change (r = .64, p < .001). This indicates that greater identification with the environment is associated with more negative feelings and poorer well-being.

These two correlations can be further understood by examining environmental identity theory. Based on this theory, we can understand environmental identity as individuals' understanding of themselves in relation to their interactions with the environment (Stets & Biga, 2003). In relation to our findings, we deduced that a stronger identification with the environment can lead to poorer well-being through increased climate anxiety and negative feelings regarding environmental issues.

An additional finding surrounding environmental identity pertains to individuals' actions when addressing climate change. When participants were asked about the ways in which they have attempted to tackle the problem of climate change, the majority reported engaging in individual lifestyle changes (i.e. altering transportation methods and more sustainable disposal practices). This theme can be applied to Clayton's (2004) work regarding environmental identity theory. Clayton (2004) suggested that a strong environmental identity can motivate individuals to participate in behaviours that benefit the environment. Considering Clayton's (2004) narrative of environmental identity in addition to our research findings, we can predict that participants who reported making lifestyle changes have a stronger identification with the environment.

Program of Study

In accordance with our hypothesis, we found that students in science-based programs were higher in climate anxiety and reported more negative feelings towards climate change in comparison to other students. When respondents were asked how their program of study reflects their feelings around climate change, more than half felt their program accurately represented their feelings towards climate change. Moreover, students in science-based programs reported recognition of environmental issues as well as participating in more class discussions regarding climate change.

This difference between programs of studies can be supported using social identity theory. This theoretical framework revolves around the formation of individual identity based on group membership (Islam, 2014). Furthermore, when forming an identity within a group, one's values become more emotionally tied to the group (Islam, 2014). In the context of a program of study, social identity theory can help explain how one's association with a specific program at McMaster University can influence their values and emotions relating to climate change. This is especially evident since certain programs discuss climate change issues more often, as reflected in our qualitative results by students in science-based programs.

We also found that students in science-based programs were higher in environmental identity. This relation can be further understood through Stapleton's (2015) work in relation to environmental identity theory. Stapleton (2015) suggested that environmental identity is developed through awareness, concern, and knowledge about environmental issues. In the same literature, it is noted that education can heavily impact one's identity

(Stapleton, 2015). Considering this perspective of environmental identity in relation to our qualitative results, we can predict that the heightened environmental identity in science programs can be related to increased awareness and knowledge within these programs.

Broader Significance

Climate change is inevitable in today's society, but the impacts expand beyond environmental implications. Our study found that climate change has significant social implications through its impact on students' anxiety and negative feelings towards climate change. Mental well-being should be included in discussions surrounding the impacts of climate change. As the environment shifts in patterns of weather, natural disasters, and climate, so do individuals' emotions and reactions (Clayton et al., 2017). Mitigating the impacts of climate change should go beyond preserving ecosystems by protecting the mental well-being of individuals amidst these challenges. Our qualitative results demonstrated that individuals are willing to take action to lessen the effects of climate change but more support is needed from higher systems such as governments to enact more systematic changes. Identifying the underlying factors of environmental identity and climate anxiety has helped us to understand the psychological and theoretical mechanisms behind it. This highlights the need to enhance our understanding of individuals' vulnerability to various influences and their coping methods. Furthering education and research concerning the impacts of climate change on the mental well-being of individuals is necessary.

Conclusion

Summary of Findings

Through our data analysis, we found that climate change affects mental well-being through the increase in climate anxiety and negative feelings towards climate change. Several participants indicated prominent feelings of powerlessness towards climate change, which is consistent with TMT (Greenberg et al., 1986). It was also found that participants who had higher levels of environmental identity experienced higher levels of climate anxiety. This finding coincides with environmental identity theory since we found that individuals who perceive the natural environment to be a large part of their personal identity experience more anxiety towards climate change (Clayton, 2004). Additionally, participants who had higher levels of climate anxiety experienced more frequent negative feelings toward climate change. When looking at programs of study, we found that students in science-based programs experienced higher levels of environmental identity, climate anxiety, and negative feelings towards climate change, when compared to students in non-science-based programs.

When asked about the most worrisome aspects of climate change, implications on the natural environment and the impact on future generations were the most common responses. Concerns about the impact on future generations were also consistent with TMT (Greenberg et al., 1986). Participants indicated that their most prominent actions in combating climate change were altering transportation methods to be more sustainable and being more responsible in disposal practices. Lastly, participants were divided on if their program of study reflected their feelings toward climate change. There were more responses who indicated that their program accurately reflected their feelings about

climate change. However, there were also some who identified a neglect within the program regarding the topic of climate change.

Limitations

While our study did find results that support current literature regarding climate change and mental well-being, limitations were present in our research. The first limitation we identified in our research was a small sample size. We had a target goal of 100 participants, however, this was difficult to achieve as our target population consisted of undergraduate students who may not have had the time or incentive to complete our survey. An example of this was the extremely high number of incomplete responses received (n = 191). Additionally, many of the clubs and societies that were contacted did not reply, which limited the range of participants included in survey responses. The lower response rate of 40 responses made it difficult to analyze correlations between variables and find statistical significance. This also had implications on the diversity of participants we were able to recruit. For example, 27 of our participants came from science-based programs of study, and only 7 were from non-science-based. As a result, the amounts of climate anxiety and negative feelings towards climate change did not significantly differ based on students' program of study. Furthermore, the vast majority of our participants were female-identifying (78.1%), displaying a further lack of diversity.

Another limitation was based on extreme items present in the Climate Change Anxiety Scale (CCA) (Clayton, 2023). After looking at all participant responses to the CCA, levels of climate anxiety were generally low. However, after analyzing our qualitative responses, climate anxiety was identified as a prominent theme. Ultimately, individual responses displayed lower levels of climate anxiety in our quantitative scale, which conflicted with the levels found in our qualitative questions. Going forward, future research surrounding climate anxiety might benefit from a scale with less extreme items. This would mitigate the variance in climate anxiety found across individual responses.

Our study was also very constrained by time since we only had two terms to complete the entirety of our research project. This may have limited our recruitment since the survey was only available for a fixed amount of time. A longer amount of time for recruitment may have increased generalisability, since a larger number of students may have had the opportunity to respond to the survey.

Lastly, it is important to consider that possible response biases may have influenced the answers participants selected in the survey. We did not conduct any further checks that tested the attention of participants, and it is possible that not all participants answered each question truthfully. To add, the content of our study may have influenced some participants to adopt social desirability bias while completing the survey. Topics such as the climate crisis and interventions to mitigate it are often linked to political opinions (Dietz, 2020). Participants may have been propelled to conform to a certain political perspective while answering our survey, and ultimately adopting social desirability bias.

Significant Insights

The most significant insights were related to feelings of powerlessness, environmental identity, and program of study. We found that students often felt powerless about the future due to fear surrounding climate change which is consistent with the theoretical underpinnings of TMT. Additionally, environmental identity was positively correlated with both climate anxiety and negative feelings towards climate change. This demonstrates how feelings towards the general environment moderate individuals' mental well-being surrounding climate change. Findings also revealed that environmental identity, climate anxiety, and negative feelings towards climate change were more prominent in science-based programs. These insights demonstrate the importance of protecting the environment to reduce mental stress and anxiety surrounding climate change. Overall, our study found that young adults who perceive the environment as an important part of their identity experience higher levels of anxiety and negative feelings toward climate change.

Implications and Future Directions

We hope that the results and findings of our study add to existing literature surrounding climate change and the resulting psychological implications. Future research should consider including a baseline mental well-being scale to solidify concrete relations between climate change and mental well-being. Although our results may not be generalizable to the entire population, our area of research provides insight into how young adults perceive, feel, and react to the increasingly pertinent issue of climate change. However, future research could benefit from a more diverse population considering we were limited in only recruiting from the undergraduate population at McMaster University. Additionally, future research would benefit from the comparison of types of actions taken to address climate change. Specifically, how feelings of powerlessness could influence individuals' choice in engaging in more individual or systemic interventions to counteract climate change.

In conclusion, research regarding these topics is relevant now more than ever, and we hope that our findings will contribute to further discoveries in this field, especially pertaining to environmental identity, climate anxiety, and negative feelings toward climate change.

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Examining the Relationship Between Attachment Styles, Academic Performance, and Mental Well-Being in McMaster University Undergraduate Students

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Abstract

Research on the implications of attachment style on well-being and academic performance among university students has grown considerably in recent years. However, previous literature has not evaluated how these variables interconnect within the daily lives of university students. The purpose of this study was to evaluate the relationship between insecure attachment styles, academic performance, and mental well-being. Three research questions were developed: (1) Do explanatory styles (pessimism, optimism) predict an individual's attachment style? (2) Do attachment styles influence mental well-being? (3) Does attachment style predict academic performance? To investigate this phenomenon, MREB reviewed and approved our research proposal. An online anonymous survey was then distributed to McMaster University undergraduate students through posters and club advertising. Qualitative data was analyzed using thematic analysis and quantitative data using the statistical software Jamovi. It was found that avoidant and anxious attachment styles are negatively correlated with mental well-being, and that avoidant attachment is positively correlated with GPA. Additionally, qualitative data revealed a positive association between GPA and well-being. Our findings contribute to the field of attachment theory by providing a deeper insight into how McMaster undergraduate students' academic and well-being services can be improved using an attachment-informed lens.

Introduction

Entering adulthood and exploring endless relationships, whether they be intimate, platonic, or intellectual, provides access to a variety of new experiences. Events like these may be difficult to manage, especially if academia is a present factor. For many undergraduate students, the emotional connections or psychosocial relationships they form during this time are important aspects when examining and navigating their sense of self. Specifically, university students are a particularly vulnerable demographic when it pertains to stress and anxiety, especially due to significant concerns with their academic performance throughout their undergraduate programs. Therefore, when examining a

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critical component, such as student GPA, it is necessary to explore additional elements that may influence their overall academic success. These elements may include interpersonal or romantic connections, general mental health, stress or ongoing pressures, and individual explanatory styles. Hence, our research study focused on examining the relationship between attachment styles, academic performance, and mental well-being among McMaster University undergraduate students.

In our research, attachment is defined as "a unique relationship between an infant and his caregiver that is the foundation for further healthy development" (Bowlby, 1969/1982, as cited in Flaherty & Sadler, 2011, p. 115). There have been two defined forms of attachment: secure and insecure, however, our research has focused on insecure attachment, specifically avoidant and anxious styles. Students' academic performance will be measured through qualitative and quantitative questions examining their overall reported GPA, and their perspectives will be reviewed by their obtained explanatory styles (historicism, dispositionism, and controllability). Moreover, mental well-being will be defined through students' reported levels of stress, perceived program difficulty, and negative emotions, along with how they handle these factors. We predict our findings will allow for a deeper insight into how an individual's attachment style might impact their academic performance and mental well-being. We hope our research findings allow for a deeper comprehension of McMaster's undergraduate population to aid in the implementation of attachment-informed services on campus.

Research Questions

Three research questions are being investigated in this study: (1) Do explanatory styles predict an individual's attachment style? (2) Do attachment styles influence mental well-being? (3) Does attachment style predict academic performance? These three questions were drafted to help ensure detailed findings when conducting our research study.

Statement of Purpose

Within the confines of our general research topic concerning the influence of attachment styles on academic performance and mental well-being, our study aims to further investigate this relationship by analyzing the adult attachment styles of undergraduate students at McMaster University. In doing so, we strived to establish a causal relationship between attachment styles, academic performance, and mental well-being. This is of particular importance because attachment styles have been consistently empirically proven to influence general well-being, including mental health outcomes and academic achievement (Bonab & Kuhsar, 2011; Bradstreet et al., 2018; Bucci et al., 2015; Cutrona et al., 1994; Guarnieri et al., 2015; Kurland & Siegel, 2013; Lapsley & Edgerton, 2002; Lavy, 2016; Mikulincer & Florian, 2003; Pritchard & Wilson, 2003; Ramsdal et al., 2015; Wilkinson, 2004).

Additionally, we aim to address and mitigate the gaps in the existing literature, as it presently lacks a focus on university students specifically. Ideally, our findings should corroborate current literature that has promising findings on the general negative implications of insecure attachment on well-being (Bonab & Kuhsar, 2011; Bradstreet et al., 2018; Bucci et al., 2015; Cutrona et al., 1994; Guarnieri et al., 2015; Kurland & Siegel, 2013; Lapsley & Edgerton, 2002; Lavy, 2016; Mikulincer & Florian, 2003; Pritchard &

Wilson, 2003; Ramsdal et al., 2015; Wilkinson, 2004). Building on this, our research on the influence of McMaster undergraduate students' attachment styles on their academic achievement and mental well-being will be utilized to establish the importance of attachment-informed campus services for students. More specifically, we will substantiate practical applications of attachment theory by determining how attachment styles may aid in the development of academic advising and campus services. We predict the findings of our study will contribute to a growing understanding of impactful student-centered services at McMaster University.

Paper Overview

There are seven covered sections in this research report. Firstly, the literature review presents a summary of prior research conducted on the subject being studied, identifies any gaps, and displays deeper context to our research questions. Secondly, the theoretical framework section will introduce the theoretical models we aim to incorporate in our research study. The two models are (1) attachment theory and (2) explanatory styles. The methodology section will review our data collection and analysis procedures, as well as provide insight into our ethical considerations. It will also provide the objective timeline of our data collection, outline possible risks or benefits involved in this study, as well as include the specifics of our data collection and analyses. The results section will provide the qualitative and quantitative findings of our research project concerning our research questions. Our discussion section will situate our findings within broader literature, including both previous studies and theories. Lastly, the conclusion will review the limitations encountered within our research project, along with the significant insights and concluding statements.

Literature Review

Thirteen academic articles were compiled and examined to determine the scope of the current literature on attachment styles as they relate to academic performance and mental well-being. The influence of attachment styles on the help-seeking behaviours of university students was explored by assessing the effects of adult attachment styles on academic performance and mental well-being. While there is a significant amount of literature on attachment theory as it relates to mental well-being and academic performance, much of this research evaluates these variables independently, not in relation to each other. Moreover, there is scarce research on how these two variables affect post-secondary students specifically, failing to account for extraneous variables found specifically in university student life. Upon evaluating the existing literature, notable gaps were found that this study aims to address. There is a significant knowledge gap, in that there are few studies on specific attachment styles as they correlate with academic performance and mental well-being, with even fewer on university students in particular. Within this limited research, findings on the differences between various insecure attachment styles, such as avoidant and anxious, are either contradictory or inconclusive. Expectantly, we aim to contribute to the existing literature by addressing and fulfilling this knowledge gap with our findings.

Attachment Styles and Academic Performance

The current literature has consistently proven that secure attachment styles correlate with better academic performance as well as emotional and social success in college (Bonab & Kuhsar, 2011; Cutrona et al., 1994; Kurland & Siegel, 2013; Lapsley & Edgerton, 2002; Lavy, 2016; Pritchard & Wilson, 2003; Ramsdal et al., 2015). Conversely, insecure attachment styles have been found to contribute to worse overall academic performance, including factors such as grade point average (GPA), drop-out rates, and emotional adjustment to college (Bonab & Kuhsar, 2011; Cutrona et al., 1994; Kurland & Siegel, 2013; Lapsley & Edgerton, 2002; Lavy, 2016; Pritchard & Wilson, 2003; Ramsdal et al., 2015). Several articles also delve into the applicability of these findings, particularly in the context of providing support to students (Heisserer & Parette, 2002; Kurland & Siegel, 2013) as well as general mental healthcare implications (Bucci et al., 2015). Evidently, there is an amalgamation of literature concerning attachment theory and academic performance. However, the existing literature does not take mental well-being into account when evaluating the relationship between attachment styles and academic outcomes. It is also worth noting that much of the current literature utilizes parent-child attachment theory to make sense of research findings, with insufficient focus on adult attachment. For the purposes of this study, adult attachment is of utmost interest.

Lapsley & Edgerton (2002) explored a research question fairly like one explored in this study: “What is the relationship between adult attachment styles and college adjustment?” (p. 486). Aiming to move away from parent-child attachment, Lapsley & Edgerton (2002) had 156 Canadian university students complete adult attachment style assessments and 2 subscales from a college adjustment questionnaire. In the context of this study, college adjustment refers to social and emotional adjustment as well as adaptability (Lapsley & Edgerton, 2002). It was found that secure adult attachment was positively correlated with college adjustment, and the opposite was true for preoccupied and fearful attachments (Lapsley & Edgerton, 2002). Lapsley & Edgerton (2002) also broached the subject of counselling practices, suggesting that adult attachment style could “be a useful diagnostic screen or… aid in the assessment of presenting problems” (p. 491). Furthermore, it was proposed that adult attachment style assessment may aid counsellors in formulating more effective, client-specific interventions (Lapsley & Edgerton, 2002). While Lapsley & Edgerton’s (2002) finding of secure attachment’s correlation with better academic outcomes has been substantiated by several studies (Bonab & Kuhsar, 2011; Cutrona et al., 1994; Kurland & Siegel, 2013; Lavy, 2016; Pritchard & Wilson, 2003; Ramsdal et al., 2015), their study is correlational and potentially limited in generalizability due to its small (N = 156), largely female (N = 102), and Caucasian (87%) sample (Lapsley & Edgerton, 2002).

Another study that employed adult attachment theory explored the influence of perceived parental social support on academic achievement under the assumption that consistent parental support encourages people to “develop adaptive attitudes… that facilitate… skill development, without inhibitory anxiety or self-doubt” (Cutrona et al., 1994, p. 376). A sample of 418 undergraduate students participated in a one-hour session during which sets of measures were completed to assess perceived social support from parents, family conflict, and parental achievement orientation (Cutrona et al., 1994). This test was repeated the following academic year with new participants, and a final third time

with a subset of participants from Study 2 (Cutrona et al., 1994). It was found that the relationship between parental social support and GPA was significant, even when statistically controlled for the other measures, such as level of family conflict and parental achievement orientation (Cutrona et al., 1994). This finding is corroborated by Ramsdal et al., (2015), who evaluated parent-child attachment in relation to academic performance and found that secure attachment influenced academic success. Cutrona et al., (1994) contribute to a larger theme within the current literature of secure attachment's association with better academic achievement ((Bonab & Kuhsar, 2011; Kurland & Siegel, 2013; Lapsley & Edgerton, 2002; Lavy, 2016; Pritchard & Wilson, 2003; Ramsdal et al., 2015). However, Cutrona et al., (1994) could not confirm a causation between parental support and academic behaviour due to their correlational design, illuminating the necessity for novel research designs on the subject.

What many of these articles have in common is their research design; five out of six of the articles evaluating attachment styles and academic achievement utilized a cross-sectional design and ran the risk of self-report bias and social desirability bias due to their use of surveys. Additionally, the generalizability of several of these articles is very questionable due to the disproportionate demographics in their samples. For example, Bonab & Kuhsar's (2011) study consists of solely Iranian students, Pritchard & Wilson's 2003 study has an 88% Caucasian sample, and Kurland & Siegel's 2013 study has a 75.3% female sample. This lack of variety in research design is detrimental to the validity of the findings on the subject, and different research designs with higher validity, such as experimental studies, are largely missing in the current literature (Cutrona et al., 1994). To mitigate these gaps in the literature, our study employs several strategies to combat self-report and social desirability bias, such as ensuring the anonymity of participants and framing questions neutrally to encourage authentic answers.

Attachment Styles and Mental Well-being

Existing literature has frequently provided findings that suggest a strong correlation between secure attachment styles and better mental well-being (Bradstreet et al., 2018; Bucci et al., 2015; Cutrona et al., 1994; Guarnieri et al., 2015; Mikulincer & Florian, 2003; Wilkinson, 2004). Accordingly, the current literature has also found that insecure attachment styles increase individuals' predisposition for mental health issues (Bradstreet et al., 2018; Bucci et al., 2015; Cutrona et al., 1994; Guarnieri et al., 2015; Mikulincer & Florian, 2003; Wilkinson, 2004). Although a novel division of the literature, a few articles dissect attachment theory's relationship with mental well-being to develop, as one article put it, "attachment-informed general mental health service model[s]" (Bucci et al., 2015, p. 1). Notably, the studies that also investigated specific attachment styles, not simply 'secure' vs. 'insecure' attachment styles, yielded contradictory or inconclusive findings (Lavy, 2016; Mikulincer & Florian, 2003; Pritchard & Wilson, 2003; Ramsdal et al., 2015; Wilkinson, 2004). Like the studies looking at attachment styles and academic outcomes, the literature on attachment styles and mental well-being is largely homogeneous in research design, mostly consisting of survey-based cross-sectional studies or narrative reviews.

One study examining attachment theory and "life satisfaction in emerging adulthood" (p. 833) found that parent attachment was a "fundamental indicator" of well-being (p. 834) due to the significant impact of secure attachment on long-term happiness (Guarnieri et

al., 2015). A sample of 385 Italian participants completed scales assessing perceived parental attachment, peer attachment, and romantic attachment (Guarnieri et al., 2015, p. 837). This study is distinguishable from the existing literature as it evaluated a mediating variable; Guarnieri et al., (2015) investigated the intersection of parental attachment, peer attachment, and romantic attachment as they relate to life satisfaction specifically in young adulthood. As a result, the findings contain the kind of detail and nuance we hope to replicate by evaluating academic achievement and mental well-being in relation to each other. It was discovered that parental attachment is the most significant, followed by romantic attachment, with peer attachment being the least influential on life satisfaction. Guarnieri et al., (2015) emphasized that their findings should be contextualized; for example, the minuscule significance of peer attachment on life satisfaction may be because "attachment to friends operates differently across the life span," (p. 842) demonstrating a distinct consideration for various extraneous variables, such as age, that situationally influence attachment styles and well-being. However, like the other studies analyzed thus far, they also utilized a research design that lacks validity and is prone to self-report and social desirability bias (Guarnieri et al., 2015).

As mentioned earlier, a segment of the current literature focuses on the applicability of attachment theory to mental well-being initiatives, such as academic advising (Heisserer & Parette, 2002; Kurland & Siegel, 2013) and general mental health services (Bucci et al., 2015). One research study provided a comprehensive literature review on the aforementioned "attachment-informed general mental health service model" (Bucci et al., 2015, p. 1). Bucci et al., (2015) asserted that attachment theory serves as a beneficial framework to aid in the development and implementation of mental health services. Their findings suggest that utilizing attachment-style assessment tools in clinical settings for general mental health services, such as clinical interviews and self-report measures, can improve patient outcomes, staff satisfaction, and costs (Bucci et al., 2015). In a similar, more academic context, Kurland & Siegel (2013) compared anxiously attached students with avoidantly attached students and provided recommendations on student advisement suited to each attachment style, emphasizing that effective academic advising would propel students "toward a more secure attachment style" (p. 26). Further, Heisserer & Parette (2002) corroborated this claim, emphasizing the importance of intentional academic advisement for 'at-risk' students, whom Kurland & Siegel (2013) found tend to have insecure attachment styles. Notably, the intrusive advising model is a recommended approach to students who are 'at-risk' or suffer from insecure attachments, defined as "intensive advising intervention with an at-risk student that is designed to (a) facilitate informed responsible decision-making, (b) increase student motivation toward activities in his/her social/academic community, and (c) ensure the probability of the student's academic success" (Heisserer & Parette, 2002, p. 74). It is important to acknowledge that the research on attachment-informed services is largely speculative, and more research is needed to establish the efficacy of such an approach to mental health care services and student services. This study aims to contribute to the building of evidence that attachment-informed student services are worth researching and implementing.

The current literature on attachment theory, academic performance, and mental well-being is predominantly cross-sectional and survey-based, causing an overarching gap in the validity and statistical power of these articles' findings. While the literature provides

compelling evidence for the relationship between attachment styles and academic performance as well as mental well-being, it scarcely evaluates the two latter variables' intersectionality, and almost none of the articles utilized for this literature review take into consideration the specific extraneous variables that arise in university student life. Secure attachment is positively correlated with better support-seeking (Cutrona et al., 1994), better mental abilities (Ramsdal et al., 2015), better academic performance (Bonab & Kuhsar, 2011; Cutrona et al., 1994; Kurland & Siegel, 2013; Lapsley & Edgerton, 2002; Lavy, 2016; Pritchard & Wilson, 2003; Ramsdal et al., 2015), higher self-esteem (Pritchard & Wilson, 2003), and overall life satisfaction (Guarnieri et al., 2015). Insecure attachment is positively correlated with the exact opposite (Bradstreet et al., 2018; Bucci et al., 2015; Cutrona et al., 1994; Guarnieri et al., 2015; Mikulincer & Florian, 2003; Wilkinson, 2004). Further research on attachment theory as it relates to academic achievement and mental well-being is crucial as predicting life and behavioural outcomes based on attachment styles has great implications for mental health and student health services. Our study hopes to gain more insight into how attachment styles influence academic performance and mental well-being to inform enhancements for student mental health services.

Theoretical Framework

The theoretical concept of attachment theory explains how individuals form interpersonal connections with one another. According to this framework, individuals possess an innate desire to form ties with their caregivers during childhood or infancy, which determines the nature of their communication as adults (Shaver & Mikulincer, 2009). Attachment theory was presented by John Bowlby and Mary Ainsworth in 1969, but the mid-1900s marked the beginning of its growth. Ainsworth contributed through her interest in security theory, whereas Bowlby focused primarily on the connections between maternal deprivation and psychosocial development (Bowlby & Ainsworth, 1991). Moreover, the psychoanalytical work of Sigmund Freud, from which both scholars drew inspiration (Shaver & Mikulincer, 2009), contributed to the development of this theory's emphasis on the formative years of an individual.

His early placements underlined Bowlby's practical involvement in the attachment mechanism, which led to the beginning of his development of the attachment theory. After World War II, he first claimed to be capable of making therapeutic discoveries by examining caregivers' childhood experiences in front of their kids (Bowlby & Ainsworth, 1991). Ainsworth's previous research in this field also greatly contributed to the development of attachment theory, as the basic principles of security theory emphasize the importance of children acquiring a safe reliance on their caregivers before navigating novel environments (van Rosemalen et al., 2016).

Attachment in Infant-Caregiver Relationships

The first empirical attachment study was the Ganda Project, conducted in Uganda in the mid-1960s, which witnessed the emergence of connections between mothers and their babies. Interviewing mothers was completed to determine how responsive they were to the indications provided by their newborns. Hence, there were three indicated attachment styles: (1) *secure*: babies were comfortable with their surroundings and rarely cried, (2): *insecure*: infants explored little and cried frequently, even in their mothers' arms,

and (3): *not yet attached*: infants were indifferent and have not yet formed an attachment to their mothers (Bowlby & Ainsworth, 1991). It was concluded that secure attachment was the most positive of the three and ranked the highest in mother-infant responsiveness.

The experiment that helped further frame the emergence of the attachment theory was the strange situation conducted in the early 1970s (Bowlby & Ainsworth, 1991). It was a routine observing process that involved brief intervals and recoveries between the child and their caregiver (Bowlby & Ainsworth, 1991). This approach involved watching an infant play in a room of toys for approximately 20 minutes, whilst their caregiver and outsiders enter, and exit said room (Bowlby & Ainsworth, 1991). The objective was to stimulate this pattern, and the infant's behaviours are monitored as the scenario is altered and stress levels fluctuate (Bowlby & Ainsworth, 1991). The four primary characteristics of the children that were monitored were their degrees of exploration or engagement with their surroundings, their response to their caregiver leaving, their stress when an outsider walked in, and their conduct when rejoined with their caregiver (Bowlby & Ainsworth, 1991).

Based on this procedure, there were two main forms of attachment: secure and insecure. All infants were grouped based on their responsiveness, with each category representing their attachment and connection to their caregiver. Secure attachment displays a safe and comfortable connection between the child and the caregiver. There were three declared forms of insecure attachment: (1) anxious/ambivalent, (2) dismissive/avoidant, and (3) fearful/disorganized (Bowlby & Ainsworth, 1991). Infants grouped with the dismissive/avoidant insecure attachment style exhibit minimal responsiveness when the carer leaves or comes back; this is done by disregarding or ignoring them (Bowlby & Ainsworth, 1991). Bowlby & Ainsworth (1991) also found that the avoidant attachment group engaged in minimal exploration or engagement with their surroundings. On the contrary, infants with the anxious/ambivalent attachment type displayed discomfort before being separated from their carer and became overly attached and challenging to soothe after being reunited (Bowlby & Ainsworth, 1991). Additionally, it was revealed that this attachment style is the most unforeseen and most prone to misinterpretation. Lastly, infants grouped with the disorganized attachment style are characterized by ambiguous and contradictory behaviours, such as crying for their caregiver whilst physically withdrawing from them or panicking when they re-enter (Bowlby & Ainsworth, 1991). As a result, the type of attachment style that infants obtain will influence their social connections and romantic relationships in adulthood.

Categories of Adult Attachment Styles

In addition to infant-caregiver relationships, there have been four established adult attachment styles: (1) secure, (2) anxious, (3) avoidant, and (4) disorganized (Bartholomew & Horowitz, 1991).

Secure Attachment

This individual possesses a high sense of worthiness and can build trustworthy connections comfortably. They also anticipate that others are generally embracing and receptive. This type has high self-worth and a positive view of others (Bartholomew & Horowitz, 1991).

Anxious Attachment

This insecurely attached individual seeks approval from others to achieve a sense of self-worth (Bartholomew & Horowitz, 1991). They are preoccupied with ruminations about their relationships and tend to need constant reassurance. This type has low self-worth, but positive views of others (Bartholomew & Horowitz, 1991).

Avoidant Attachment

This insecurely attached individual anticipates rejection and failure in relationships (Bartholomew & Horowitz, 1991). Hence, they are dismissive, avoid building close connections, and prefer shallow relations due to negative views of others while holding a high sense of self-worth (Bartholomew & Horowitz, 1991).

Disorganized Attachment

This insecurely attached individual tends to exhibit unpredictable or erratic behaviour, including lashing out in their relationships (Bartholomew & Horowitz, 1991). They lack a sense of trust in both them and others, while also holding a low sense of self-worth. This type is also known as “fearful-avoidant” (Bartholomew & Horowitz, 1991).

Attachment in Adulthood

As stated, the support and care one receives from their parent or caregiver as an infant will determine the causality of their relationships as they grow through life. Fraley (2019) examined a sample of caregivers and their children who have been studied over time (from the age of 1 month to 18 years old). It was discovered that, by the time they were 18 years old, secure individuals had a greater probability than those insecurely attached of having grown up in consistent households, had more parental encouragement throughout their lives, and experienced more durable friends throughout their youth (Fraley, 2019). Secure and stable families may include, but are not limited to, a present paternal figure, or minimal parental mental illness. It was also prominent that secure individuals have developed effective communication and positive problem-solving skills, become more dedicated to their partners or friends, and improved physically and mentally (Fraley, 2019; Mikulincer & Shaver, 2016).

Moreover, Stevens (2014) examined approximately 100 anxiously and avoidantly attached undergraduate students. Each student had to complete two scales, which would give the researcher a deeper insight into their attachment style (Stevens, 2014). It was determined that individuals who are avoidant or anxious have difficulty expressing their feelings effectively (Stevens, 2014). In their infancy, anxiously attached children’s behaviour is linked to a hypervigilant approach, which is when an individual acts out by displaying excessive emotion to get notice from their parents. This carries over into adulthood, as anxiously attached people (more than avoidants) fail to express or manage their feelings. Hence, they tend to act more abruptly, as they allow their feelings to obstruct their true intentions (Stevens, 2014). On the other hand, avoidants lack emotional self-awareness compared to anxious individuals, which explains avoidants' impulsivity and emotional dysregulation (Stevens, 2014). This is due to the deactivation strategy of emotions, where avoidants disconnect from their feelings of rejection when a caregiver,

or in this case a partner, is failing to satisfy their objective demands (Mikulincer & Shaver, 2016).

Since every attachment style favours a distinct type of approach, it is crucial to keep in mind that different treatments are needed for each kind of attachment. While metacognition might be more effective for treating avoidant attachment as it helps them self-reflect on their emotions more accurately, anxiously attached individuals might profit more from emotion management strategies to help them deal with challenging feelings (Stevens, 2014). These factors explain the importance of caregiver-infant relationships and the significance they hold on a person's personality development.

Attachment theory is the powerhouse of our research study, as it will help us assess each participant's attachment style, and it will provide a deeper insight into how it is associated with their academic performance and their mental well-being. A student's susceptibility to anxiety is vital and being able to understand its connotations from all angles is crucial. Hence, this theory will help further comprehend McMaster University undergraduate students' ideal psychosocial communications and academic routines.

Explanatory Styles

Psychological characteristics known as explanatory styles reveal how individuals justify to themselves the reasons for their experiences of specific events. This theory was founded by positive psychologists Martin Seligman and Christopher Peterson in the early 1970s (Seligman, 1972). There are two forms of explanatory styles: optimistic and pessimistic. Justifications indicative of a pessimistic explanatory style tend to characterize positive results as external, specific, and unstable (Peterson et al., 2013). This means that the reason this good event occurred was due to a situation outside of their control, and it is unlikely to happen again. Pessimists also tend to view negative results as stable, global, and internal (Peterson et al., 2013). This means that the reason this negative event occurred was due to a situation that was personally their fault, and that said situation will continue to occur. On the contrary, justifications indicative of an optimistic explanatory style tend to characterize positive results as internal, global, and stable (Peterson et al., 2013). From an optimist's perspective, negative situations will be characterized as external, specific, and unstable (Peterson et al., 2013).

Two concepts helped formulate this theory: depression research and the theory of learned helplessness. Following a conversation on depression with colleagues, Seligman developed the idea of attributional and explanatory styles, concluding that people with depression often have a more pessimistic outlook and describe their experiences accordingly (Peterson et al., 2013). Thus, the notion of learned helplessness supported this theory by stating that people eventually come to believe that they have no control over or ability to alter their current circumstances after being exposed to several hardships (Seligman, 1972). An animal study that involved subjecting a dog to several electric shocks was conducted to corroborate this. After a day, the dog was moved into a setting where the jolts could be terminated with a straightforward fix, but it continued to receive them without fighting back (Peterson et al., 2013)

However, Peterson et al., (2013) recognized that their hypothesis could not be verified on human beings due to unethical protocols and the general simplicity of the experiment. Hence, they interviewed individuals who have experienced a negative event and asked

them for their perceived justification. They discovered that if an individual's experience is intrinsically linked to their attributions, it is considered stable, global, and internal, which results in a protracted state of helplessness (Peterson et al., 2013). However, if they obtained a specific, external, and unstable association with the negative situation, there was no protracted helplessness (Peterson et al., 2013). This experiment also revealed that pessimistic individuals possess lower self-esteem than optimists, as internal attributions are taken more personally (Peterson et al., 2013).

A study conducted by Schulman et al., (2014) had approximately 175 college students from all four levels complete the Attributional Style Questionnaire (ASQ) to determine if explanatory styles predict GPA scores and to measure each student's explanatory style depending on the outcome. Using the scale, Schulman et al., (2014) presented individuals with hypothetical scenarios to measure their perceived attributions. First, each student was asked to list one primary reason for the incident and then assign a rating based on three attributional criteria (Semmel et al., 1978). The results of this study indicated that one's explanatory style accurately predicted their GPA (Schulman et al., 2014). These outcomes can also be explained using the theory of learned helplessness, which holds that when unfavourable experiences (poor grades in this case) escalate, students' negative attributions increase, as their confidence levels begin predicting their performance rather than their true proficiency (Schulman et al., 2014).

Within explanatory styles, there have been three additional dimensions examined: dispositionism, historicism, and controllability. Dispositionism is the degree to which individuals attribute situations to internal factors. Historicism shows the degree to which individuals attribute situations to factors perceived as consistent, whereas controllability is the degree to which individuals hold perceived control over situations or outcomes. Andreychik & Gill (2014) have utilized these dimensions in the development of the Social Explanatory Styles Questionnaire (SESQ) to further explore individual attributional differences.

Through a total of six studies, Andreychik & Gill (2014) assessed the psychometrics of the SESQ using statistical analyses, along with the scale's overall validity. The validity assessment had participants provide explanations for behavioural attributes of individuals in hypothetical scenarios on the basis of the three attributional dimensions. Andreychik & Gill's (2014) results and findings supported the SESQ as a valid scale with three structured dimensions. They discovered that controllability rankings were substantially higher than both styles, but dispositionism rankings surpassed historicism immensely (Andreychik & Gill, 2014). As their study was composed of mostly Western participants, their results have been attributed to the individualistic mindset that situations tend to be perceived as highly controllable (Andreychik & Gill, 2014).

As attachment theory is the primary focus of our research project, explanatory styles measured by the SESQ will serve as a secondary theoretical framework. Helplessness is a relatable emotion that many students may experience if receiving negative feedback on their academic performance. Moreover, such helpless events may also place a negative strain on their mental health. Therefore, the SESQ will be situated within our study as an additional framework to help ensure a broader understanding of McMaster University's undergraduate population, as well as raise awareness of the ties between attachment, mental well-being, and academic performance.

Methodology

Overview

This study was conducted under the supervision of Dr. Sarah Clancy by four fourth-year Honours Social Psychology students as part of their thesis requirement. Approval from the McMaster Research Ethics Board (MREB) was obtained, and the MREB-approved survey platform LimeSurvey was utilized for data collection. Convenience sampling was used since our target population was McMaster University undergraduate students over the age of 18. We recruited participants by reaching out to third parties (McMaster clubs and societies) and by putting up posters around campus. Our survey was open from mid-November 2023 until mid-February 2024 and consisted of 11 questions.

Ethical Concerns

In this study, we identified ethical issues regarding psychological and social risks. However, the severity of these risks was not greater than those commonly encountered in daily life. Feelings of embarrassment, discomfort, concern, or distress might have emerged while completing the study due to the sensitive questions regarding academic performance, attachment styles, and mental well-being. We have taken precautions regarding these possible psychological risks by providing support resources in the letter of information and maintaining the participants' anonymity. In addition to this, we ensured confidentiality through third parties which also prevented potential biases. Additionally, there are potential social risks surrounding confidentiality; if a participant completed the survey in a public setting, this may raise concerns about identity disclosure. Therefore, we advised participants to complete the survey in a private setting to preserve their anonymity. It is also important to note that this research poses no greater risks than those in everyday life.

Additionally, we advised participants not to engage with posts about our study on social media (e.g., comments, likes) to further safeguard their anonymity and protect against any potential breaches of confidentiality. Since we used a non-probability convenience sampling method with snowballing, we prevented conflict of interest and potential biases through third parties during the data collection. However, a researcher's personal traits (e.g., gender, age, ethnicity, and economic background) might have shaped the research from the start, influencing how it was designed, how data was collected and analyzed, and how the results were interpreted and shared.

Recruitment

Group members who were not affiliated with McMaster clubs contacted the third party using the provided Appendix B script to avoid a conflict of interest. The third parties, who agreed to distribute the study, contacted the club members using the Appendix C script. Appendix D consists of our direct script, which was posted on our behalf without a conflict of interest present. Since the study was distributed by a third party through email and/or social media depending on their permission, this process allowed us to minimize the possibility of conflict of interest. Our printed posters were approved by the McMaster Students Union (MSU) and placed at MSU-approved locations. The letter of information (Appendix A), outlining benefits, risks, and details, was provided to participants at the

beginning of the survey. Their implicit consent was approved once clicking "I certify that I have read the above information and consent to participate in this study" under the letter of information.

Survey Procedure

Prior to beginning the survey, participants were provided with a comprehensive letter of information. This details information about the researchers, the purpose of the study, potential risks of completing the survey, confidentiality, the right to withdraw consent, and how to obtain the study results if desired. Participants were also informed that the survey would take 10-15 minutes to complete. Our survey consisted of 11 questions, most of which utilized a Likert scale. There were four demographic questions, three qualitative questions which assessed academic performance, and the remainder evaluated attachment style, explanatory styles, and academic performance.

Data Collection

The survey was open to the public starting November 21st, 2023 and closed February 17th, 2024. The data files were exported from LimeSurvey and securely stored in a password-protected document on password-protected computers. Moreover, the access was limited solely to members of the research team. Our goal was to obtain 75 participants. The survey garnered a total of 504 responses, with 389 partial responses and 115 full responses. Data was collected from 115 participants (Mage=3.40, SDage= 1.59; Myear of study=2.59, SDyear of study=1.39), but three participants were removed as they were graduate students (n = 1) or not students at all (n = 2). Thus, the total sample size after removals was 112.

Challenges in Data Collection

In the process of recruitment and data collection, we encountered several challenges. We reached out to 35 clubs and societies at McMaster, and only three responded and agreed to distribute our survey. Consequently, this limited the reach of our survey. This was exacerbated by the fact that we had a limited time frame for which the survey was active, as it was open for just under three months. We also received a staggering number of incomplete responses, with only 33% of responses being fully completed. This could be due to a plethora of reasons, such as research design, participants finding the subject topic boring, or changing their minds in terms of consent to participate. Lastly, due to unforeseen technical difficulties, we lost demographic data on gender identity. We acknowledge that the absence of gender as a variable in our study may impact the depth of our analysis and understanding of the sample population.

Data Analysis

In terms of quantitative data analysis, we obtained the participants' responses through the LimeSurvey platform to analyze and interpret the data using the statistical software Jamovi. The Short Warwick-Edinburgh Mental Well-being Scale was used to measure university students' mental well-being (NHS Health Scotland, 2007), including seven items (e.g., "I've been feeling optimistic about the future"). A 5-point Likert scale was used ranging from 1 (None of the time) to 5 (All of the time). The Relationship Structures (ECR-RS) Questionnaire was used to measure general attachment style (Fraley et al., 2014),

including eight items (e.g., “It helps to turn to people in times of need”, α = 0.79). Items one through six measured avoidance, item seven was an attention check, and item eight measured anxiety. A 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree) was used. The Social Explanatory Styles Questionnaire (SESQ) was used to measure the degree of historicism, dispositionism, and controllability, using three hypothetical scenarios (Andreychik & Gill, 2014). For each scenario, we included three items (e.g., “A major factor is Steven’s character traits”), and used a 5-point Likert scale ranging from 1 (No) to 5 (Yes).

For qualitative data analysis, we coded the data and identified themes, subthemes, and relationships across the responses provided to the three open-ended questions. The first open-ended question was used to assess participants’ ideal study techniques and environments, such as flashcards or group/individual study. We also asked participants to describe the perceived difficulty of the program as the second open-ended question. Lastly, we asked participants about the impact of academic pursuits on their well-being, prompting them to articulate the degree to which academics influence their well-being, whether positively or negatively.

Results

Demographics

Our survey’s respondents were made up of 112 McMaster undergraduate students ages 18 and above (*N* = 112). Of these 112 respondents, 29% of participants were 21 years old (*n* = 33) and 41% were in their fourth year of study (*n* = 46). Participants were 45% White, 14% East Asian, 13% South Asian, 11% mixed, and 17% of various other ethnicities. The mixed category, for our purposes, included all responses that listed two or more ethnic categories or explicitly used the term ‘mixed’ in their response. Across the data, majors were also categorized into seven faculties: Social Sciences (34%), Science (32%), Engineering (19%), Health Science (5%), Business (5%), Humanities (5%), and Arts & Science (<1%).

Quantitative Results

The results of our questions with close-ended responses are detailed in this section. These questions include the questionnaire on explanatory styles, the well-being questions, and students’ self-reported GPA.

GPA

Out of 112 responses, we found that the majority (*n* = 69) of participants reported an A-range GPA (Figure 1). The second most common (*n* = 33) GPA was within the B-range. We received no responses reporting an F-range GPA, and the least common response (*n* = 1) was a D-range GPA.

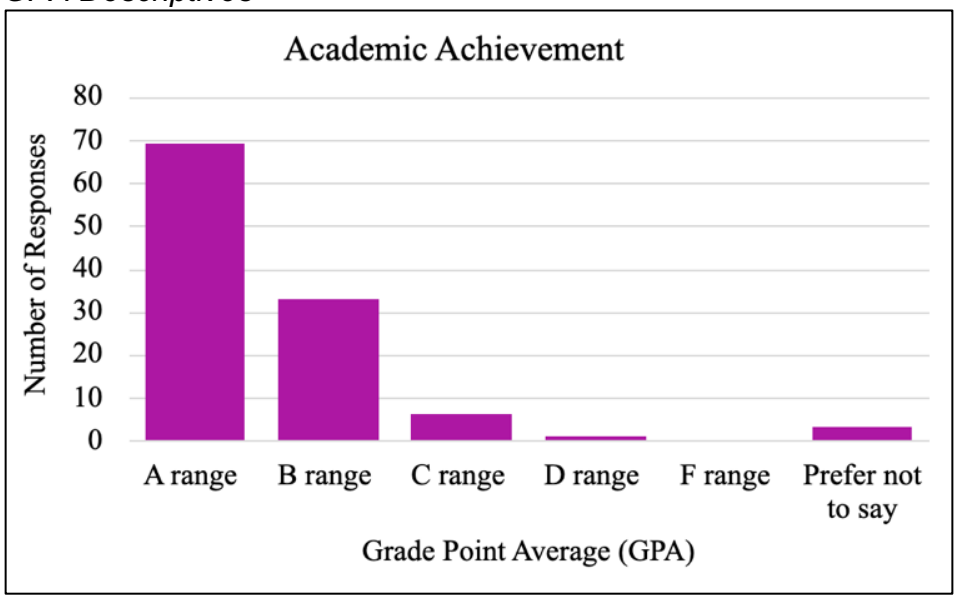
Explanatory Styles

The study assessed explanatory styles across three hypothetical situations by posing three specific questions (e.g., “Steven never tries to take another’s perspective. When he disagrees with someone, he is stubborn, angry, and insulting.”). The first question gauged

dispositionism, the second examined historicism, and the third evaluated controllability. We were not able to produce any significant findings concerning explanatory styles due

Figure 1

GPA Descriptives



to our scale styles lacking internal reliability. Consequently, our first research question, do explanatory styles predict attachment styles, resulted in a null hypothesis.

While some of our findings produced significant p-values ($p < .05$), the lack of internal reliability means these findings are not statistically significant. We first looked at whether the three dimensions of explanatory styles (dispositionism, historicism, and controllability) were associated with our two insecure attachment styles, avoidance and anxiety. As seen in Table 1, dispositionism was negatively associated with average avoidance. We also

Table 1

Means, standard deviations, and Pearson's correlations for Attachment Styles

	1	2	3	4	5
1. Dispositionism					
2. Historicism	-0.128				
3. Controllability	0.145	-0.066			
4. Average Anxiety	0.138	-0.017*	-0.027		
5. Average Avoidance	-0.046*	0.077	0.078	0.164	
Mean	4.08	3.65	3.98	5.52	2.99
SD	0.72	0.79	0.87	1.74	1.18

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

Table 2
Means, standard deviations, and Pearson's correlations for Well-being

	1	2	3	4
1. Dispositionism				
2. Historicism	-0.128			
3. Controllability	0.145	-0.066		
4. Well-being	-0.047*	0.073	-0.100	
Mean	4.08	3.65	3.98	3.71
SD	0.72	0.79	0.87	0.62

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

found a negative correlation between historicism and average anxiety. However, historicism was not associated with average avoidance based on p-value. In terms of controllability, it did not produce a significant p-value in association with attachment anxiety or attachment avoidance.

Next, we looked at the three dimensions of explanatory styles and mental well-being. While we knew the findings would ultimately be insignificant, we were still curious about whether an association could be determined by way of p-value. As shown in Table 2, historicism was positively associated with mental well-being with an insignificant p-value ($p > .05$), and dispositionism being negatively associated ($p < .05$) as well as controllability ($p > .05$). Lastly, we evaluated explanatory styles against GPA. As seen in Table 3, none

Table 3
Means, standard deviations, and Pearson's correlations for GPA

	1	2	3	4
1. Dispositionism				
2. Historicism	-.128			
3. Controllability	.145	-.066		
4. GPA	.038	-.030	.012	
Mean	4.08	3.65	3.98	1.56
SD	.72	.79	.87	.97

of the three dimensions of explanatory styles produced significant p-values for GPA.

Attachment Styles

Attachment styles were evaluated in question four, with avoidance assessed in items one through six, and anxiety assessed in item eight. We then averaged the scores to determine the severity of respondents' insecure attachment styles. Descriptive statistics and Pearson's correlations are reported in Table 4, and the results of the multiple regression analysis are reported in Table 5. As shown in Table 4, avoidant attachment garnered a mean score of 2.99 (out of 7) and a standard deviation of 1.18. The mean score for anxious attachment was 5.52 with a standard deviation of 1.74. Utilizing Cronbach's alpha, the reliability analysis suggested good internal consistency. Both avoidant attachment and anxious attachment were significant, and negatively associated with well-being (ravoidance= -.400, pavoidance < .001; ranxious= -.402, panxious< .001). Additionally, the correlation matrix revealed that GPA was negatively associated with well-being (*r= -0.195,* < .001*)*. Interestingly, avoidant attachment was positively associated with GPA (*r*= -.279, *p* < .01). However, anxious attachment was not significantly associated with GPA (*p* > .05).

As seen in Table 5, our R^2 value is 0.28, meaning 3% of the variance in mental well-being can be explained by the predictors as a whole. While this is a fairly low percentage, our R^2 value may be low because the amount of variables involved in human behaviour, an intrinsically complex subject, is enormous and beyond the scope of this project. As for our statistically significant findings, both anxious attachment was negatively associated with well-being (β = -.34, *p* < -.001), and avoidant attachment was negatively associated with well-being (β = -.32, *p* < -.001). Contrary to the correlation matrix, GPA was not significantly associated with well-being when a linear regression test was conducted.

We conducted linear regression analyses to compute the estimated marginal means. Figures 2 and 3 display our results. Figure 2 displays three parallel lines when examining average avoidance, GPA, and well-being. In this interaction, GPA and average avoidance are the independent variables, whereas well-being is the dependent variable. As these

Table 4

Means, standard deviations, and Pearson's correlations

	Well-being	GPA	Average Avoidance	Average Anxiety
Well-being	—			
GPA	-0.195*	—		
Average Avoidance	-0.400***	0.279**	—	
Average Anxiety	-0.402***	0.118	0.164	—
Mean	3.28	1.56	2.99	5.52
SD	0.62	0.97	1.18	1.74

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

Table 5

Standardized regression coefficients for the predictors of well-being

Predictors	Well-Being
Anxious Attachment	-0.339***
Avoidant Attachment	-0.324***
GPA	-0.064
R^2	0.28

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

lines do not intersect, we conclude that there is no interaction between GPA and average avoidance. Figure 3 also displays three parallel lines and examines average anxiety, GPA, and well-being. In this interaction, average anxiety and GPA are the independent variables, whereas well-being is still the measured variable. As the lines in Figure 3 do not intersect, we concluded that there is no interaction between GPA and average anxiety.

Qualitative Results

To get an in-depth analysis of McMaster students' university experiences, we asked three main open-ended questions that are outlined below.

Figure 2

Well-being x Avoidance; by GPA

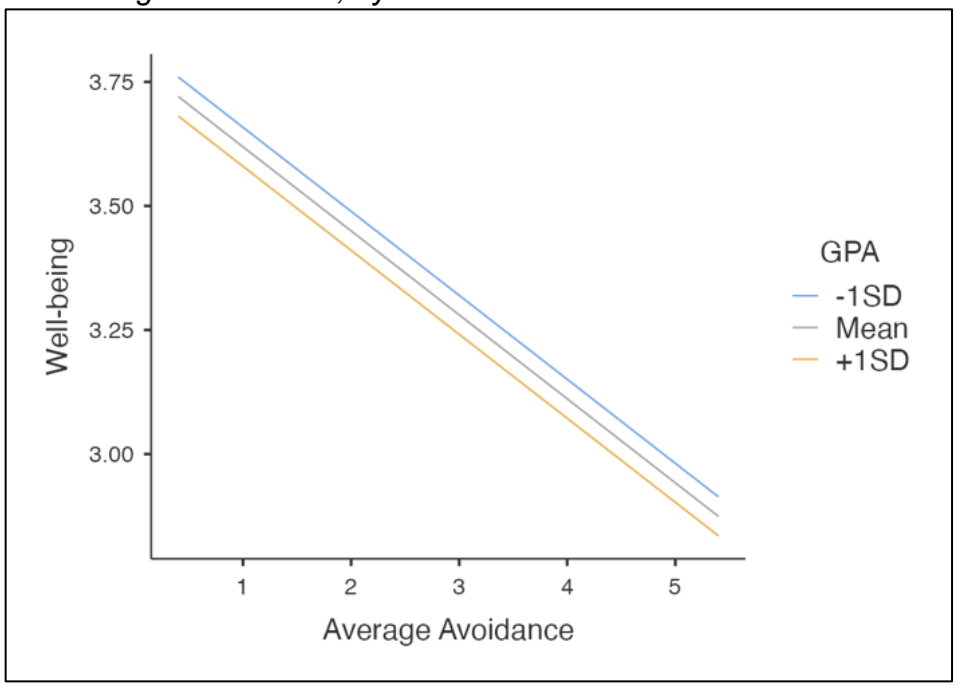
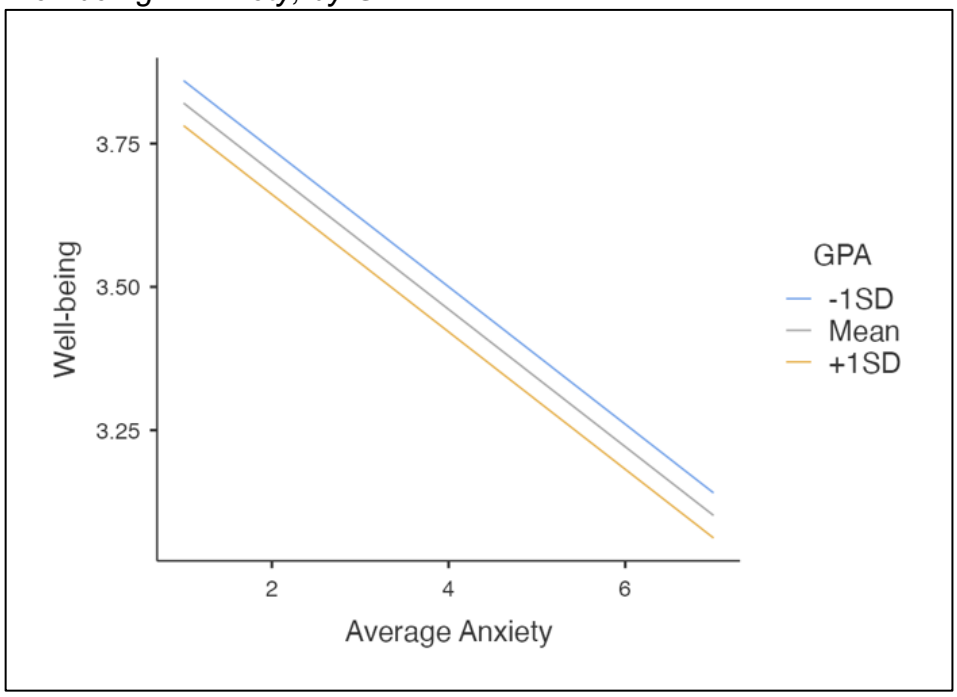


Figure 3
Well-being x Anxiety; by GPA



Qualitative Question 1: Please briefly describe your ideal study environment(s) or techniques (e.g., Flashcards, Group/Individual Study, etc.).

The results of the qualitative survey question on ideal study environments and techniques provided valuable insights into the preferences and strategies of the respondents, particularly in light of their attachment styles. Coding this particular question was difficult due to its ambiguous wording, causing participants to answer in diverse ways. Therefore, participants' responses overlapped within the different categories and subcategories utilized for thematic analysis. Common study techniques included active recall methods such as flashcards and the blurt method, as well as techniques such as doing practice questions, rewriting notes, and reviewing concepts. Interestingly, there were multiple mentions of participants switching study techniques depending on what courses they were preparing for. The most commonly reported study technique was individual study (*n*=46). The prevalence of individual study preferences among respondents, coupled with the predominance of avoidantly attached individuals within the sample, may suggest a potential correlation between attachment orientation and study habits. Individuals with avoidant attachment tendencies may prefer solitary study environments and techniques that emphasize independent learning. We theorize that these findings shed light on the intersection between attachment theory and educational practices, highlighting the need for resources to accommodate diverse learning styles and attachment orientations among students.

Qualitative Question 2: Please provide a brief description of the perceived difficulty of your program.

The results of our second qualitative question regarding the perceived difficulty of the program, in conjunction with the demographic information provided, offer intriguing insights into the experiences and academic performance of the respondents. Notably, a significant portion of the sample (n = 55) reported finding their program perceived as difficult, suggesting the presence of substantial academic challenges and rigor. This finding is particularly noteworthy given that the majority of respondents were A-range students, indicating that even high-achieving individuals may encounter academic difficulties or perceive their program as demanding. Moreover, being avoidantly attached was positively associated with higher GPAs within the sample adding an additional layer of complexity to these findings. It suggests that individuals with avoidant attachment tendencies, who may be more inclined to prioritize academic pursuits and independent study habits, may also excel academically due to perceiving their program as challenging. We theorize that this may be because the perceived difficulty of one's program may evoke avoidant tendencies, such as focusing time and labour on academic pursuits instead of relationships. Overall, these results underscore the multifaceted nature of academic experiences and the interplay between attachment styles, perceived difficulty, and academic performance, warranting further exploration to better understand and support students in their educational endeavours.

Table 6

Qualitative Question 2, Survey Question 5

Theme	Response
1. **Difficult:** "My program is perceived to be very difficult for its large course load and difficult concepts"	2. n = 55 (50%)
3. **Not difficult:** "Everyone says that my program is either interesting or easy. There is an expectation that I probably will have low job prospects once I graduate and that my industry is not valued as much as others are."	4. n = 22 (20%)
5. **Both (difficult and not difficult):** "I think some people think it is a difficult program, if they don't enjoy reading or writing lots. Other who are in very difficult programs like engineering might think it's not so difficult."	6. n = 22 (20%)
7. **Neutral:** "Perceived difficulty - basic/ medium?"	8. n = 24 (21%)

Qualitative Question 3: Please briefly describe the extent to which your academics impact your well-being, either positively or negatively.

The results of the qualitative survey question on the extent to which academics impact students' well-being revealed a significant distribution across various response categories. We found a significant positive association between academic performance and well-being. Interestingly, a sizable proportion of students (*n* = 51) indicated that their academics had both positive and negative effects on their well-being, suggesting a complicated and nuanced relationship between mental health and academic achievement. Furthermore, a considerable portion (*n* = 32) reported largely negative effects, whilst the least common response (*n* = 11) mentioned primarily positive effects. Curiously, some (*n* = 15) depicted not being impacted by their academics at all. These results showcase the complex relationship between academic experiences and well-being, which emphasizes the need for more research and the implementation of specialized support systems to meet the range of requirements of students and their learning environments.

Table 7

Qualitative Question 3, Survey Question 7

Theme	Responses
9. **Positive:** "My academics make me disciplined which is a great thing. It makes me sharper, knowledgeable although it gives me countless sleepless night. So, I would say it impacts me positively 9 on a scale of 10"	1. *n* = 11 (10%)
10. **Negative:** "Academics impact my well-being negatively because of the stress factor and constant studying"	2. *n* = 32 (29%)
11. **Both:** "A good grade positively affects my mental health, validates my feelings of worthiness and competence. A bad grade and/or increased workload increases feelings of self doubt and stress"	3. *n* = 51 (47%)
12. **No effect:** "I don't think my academics impact my well-being because I don't let it get to me…"	4. *n* = 15 (14%)

Discussion

Our quantitative data analysis yielded four main findings. The first finding was that there was no significant correlation between explanatory styles and any of our other

variables: attachment styles, well-being, or academic performance. We also found that both anxious and avoidant attachment styles were negatively correlated with well-being. Most surprisingly, avoidant attachment was positively associated with GPA. Similarly, it was found that GPA was negatively correlated with well-being. In contrast, our qualitative data revealed a positive association between academic performance and well-being. These findings are further explored in the context of current literature in the following sections.

Explanatory Styles and Attachment Styles

The theory used in this section was Seligman and Peterson's attributional explanatory styles, which explain the different dimensions to which individuals may attribute situations or outcomes. We hypothesized positive correlations when associating explanatory styles with attachment styles, academic performance, and mental well-being. In terms of explanatory and attachment styles, we found no significant correlations between the two variables. Explanatory styles also presented a null hypothesis when examining their relation to mental well-being and academic performance. This means that regardless of the attributions an individual may possess, their perceptions pose no effect on their academic success or their psychosocial relationships with others. Some potential explanations for these results may include the lack of representations for securely attached individuals, as our study focused on anxious and avoidant attachment. Moreover, the SESQ's reliability analysis presented lower internal reliability, making it impossible to produce significant findings.

Our findings are not situated within the existing literature, as previous studies possess a large knowledge gap. However, some studies have found a positive correlation when relating an individual's explanatory styles to attachment styles and academic performance. For instance, Schulman et al. (2014) presented a positive correlation between students' explanatory styles and their GPA. A study conducted by Greenberger & McLaughlin (1998) also found that securely attached individuals also exhibit a positive explanatory style. However, there is a lack of recent literature regarding the associations between attachment and explanatory styles, meaning that further research is needed. Moreover, existing literature is immensely limited when examining the effect of explanatory styles on mental health; previous studies have only covered effects on self-esteem (Macsinga & Nemeti, 2012). The lack of current literature supports the notion that extended research is needed to further explore the relationships between explanatory styles, attachment styles, and mental well-being.

Attachment Styles, Grade Point Average, & Mental Well-Being

A statistically significant negative correlation between GPA and well-being was established. Interestingly, our qualitative findings contradicted this quantitative finding. When analyzing our open-ended questions, a positive relationship between GPA and well-being was discovered. Respondents mentioned that performing well academically improved their mood, whereas performing poorly decreased their emotional well-being. There are several possible explanations for these contradictory findings. Most notably, our sample is fairly small and heavily skewed; our respondents overwhelmingly possessed high GPA scores, preferred independent modes of study, and were in their

fourth year of study. It is entirely plausible that respondents scored high in GPA but low in well-being due to confounding factors outside the bandwidth of this study, such as socioeconomic status, gender identity, and ethnicity. Moreover, participants may be prioritizing their academic performance over other aspects of their university experience, such as relationships and mental health, leading to good GPA performance and poor mental well-being.

Furthermore, we hypothesized that insecure attachment styles would negatively influence mental well-being. Our findings supported this hypothesis, as we found a statistically significant negative correlation between anxious attachment styles and well-being, as well as a statistically significant negative correlation between avoidant attachment and well-being. These findings are corroborated by existing literature, as the negative influence of insecure attachment styles on well-being is well documented. Nonetheless, further research utilizing different research methods and larger, more representative sample sizes is needed when examining attachment styles, GPA, and well-being. Notably, past literature has revealed a knowledge gap, with inconsistent findings on specific attachment styles. Consequently, further research focusing on specific attachment styles is of particular importance, as well as the interrelation of GPA and well-being.

Attachment Styles and Academic Performance

We found a statistically significant positive correlation between GPA and avoidant attachment. This finding did not align with our hypothesis, as we predicted that insecurely attached individuals would demonstrate poor academic performance. Our qualitative findings, particularly questions 2 and 3, helped contextualize this relationship between avoidant attachment and academic performance. When asked about ideal study techniques and environments, most respondents disclosed a preference for individual study and quiet environments. This aligns with the tendencies of avoidantly attached individuals, as they tend to isolate and maintain shallow relationships. With this understanding, it is conceivable that avoidant attachment and GPA are positively correlated because avoidant individuals have a penchant for an individualized, narrow focus on their academics.

While our finding on GPA and avoidant attachment contradicted our hypothesis, it is not entirely unsupported in existing literature. Notably, Kurland & Siegel's (2013) study revealed that avoidantly attached high school students obtained higher GPAs and enrolled in more college credits, exhibiting academically driven behaviour. As it stands, current literature has an inconclusive consensus on the relationship between GPA and avoidant attachment. This is in opposition to findings on insecure attachment styles in general, which have consistently yielded a negative relationship with GPA. Hence, further research is needed to establish a generalizable and statistically powerful understanding of specific attachment styles and their influence on academic performance.

Broader Significance of Research

The main purpose of our research was to establish a deeper understanding of how insecure attachment styles influence mental well-being and academic performance. Subsequently, our findings contribute to a small but growing amount of literature that explores the potential benefits of attachment-informed support services at universities.

As such, further research on the effects of attachment style on student well-being is crucial in understanding the efficacy of attachment-informed services and how to implement them.

Conclusion

Summary of Findings

Our data analysis aimed to answer four research questions. Firstly, we aimed to examine if explanatory styles predicted attachment style, which presented a null hypothesis. Second, we evaluated the relationship between insecure attachment styles and mental well-being, which produced our most significant finding; we found that both avoidant and anxious attachment were associated with decreased well-being. Lastly, we analyzed the relationship between attachment styles and academic performance. Surprisingly, we found that avoidant attachment was associated with a higher GPA. While our quantitative analysis produced a negative relationship between well-being and GPA, our qualitative data revealed a positive correlation between academics and well-being, as well as a majority preference for individualized study. Interestingly, the majority (n = 84) of our sample displayed an anxious attachment style and almost half (n = 50) exhibited avoidant attachment.

Limitations

Although our research provided valuable insights into how undergraduates' attachment styles affect their academic endeavours and mental health, there were several limitations throughout our research study that must be acknowledged for both present and future investigations surrounding this topic.

Research Design

Similar to studies in the literature review section, this research study also utilized a cross-sectional research design. Cross-sectional studies only capture a snapshot in time of data which makes it difficult to determine causal relationships and changes over time between variables Therefore, in our study, we can identify associations and correlations between variables, but we cannot with certainty determine the direction of those causalities. Furthermore, among the seven items in the scale on the survey, only one was dedicated to examining anxious attachment, while the remaining six focused on avoidant attachment style. A more equal and balanced distribution of questions pertaining to both insecure attachment styles could generate a more comprehensive and holistic understanding of their impacts on our participants. Our study was also limited by the imposed time constraint on data collection. The survey was open for just under 3 months and could have benefited from a greater data collection period to gather more participants. Future investigations should utilize a longitudinal research design and more thorough scales for attachment styles.

Sampling Bias

Convenience sampling is a non-sampling method of selecting research study participants that is easily accessible and convenient (Emerson, 2015). This study was limited to undergraduate students at McMaster University, and thus results may be

skewed towards this specific demographic cohort and the lived experiences of these young adults. Thus, replicability issues arise considering the use of convenience sampling in our study. We acknowledge that further research with larger and more diverse samples is required to understand the true effect of the associations between the variables and for the results to be more generalizable to the broader population.

Self-Report Bias

Self-report bias, also known as respondent bias, is a prevalent issue in research and surveys in which participants may knowingly or unknowingly provide false or deceptive information about themselves or their experiences (Lavy, 2016). This bias can occur for a multitude of reasons such as social desirability, memory limitations, cognitive biases, social context, or emotional state (Bonab & Kuhsar, 2011). To minimize the effect of self-report bias we utilized tools such as an anonymous take-home survey and careful wording. Anonymous surveys ensure confidentiality and comfort and avoid creating a heightened emotional state or threatening environment for the participant as opposed to surveys that are completed under the direct supervision of a research associate (Alessie & Martin, 2010). However, despite our proactive efforts to implement these varied precautions, it is still likely that respondents may have provided inaccurate or dishonest responses.

External Validity

External validity refers to the extent to which the research survey's findings can be generalized or applied to contexts, populations, and circumstances that extend beyond that of the current research study (Lynch, 1999). As our research is entirely aimed at the McMaster student population the results may not be useful nor generalizable beyond this specific demographic. Additionally, post-data analysis, it became evident that the majority of our sample was insecurely attached and in the A-range GPA bracket. Moreover, the majority of our sample consisted of fourth-year social science students, further impacting external validity.

Gender Demographic Data

Unforeseen technical difficulties led to the data loss of the gender identity question on our survey. The inclusion of a gender question in a research survey is beneficial as it allows researchers to gather essential demographic information that can provide insights into how various groups experience or respond to different phenomena (Smith & Koehoorn, 2016). Gender is a fundamental aspect of identity that can influence behaviours, attitudes, and perspectives in significant ways (Heidari et al., 2017). The loss of this data limited the comprehensiveness and generalizability of our findings.

Attention Check Question

Attention check questions are strategically placed in surveys to ensure that participants are paying attention to the contents of the survey (Franki et al., 2017). Our attention check did not specify which response participants should choose to indicate they are paying attention, resulting in participants choosing varied responses on the Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). Consequently, it was difficult to determine which respondents to exclude. Thus, survey question four, item seven, would have benefited from more clarity and precise instruction. Designating a specific number

on the Likert scale for participants to choose, would have provided participants with adequate clarity and increased the validity of our findings.

Significant Insights and Contributions

Our research provides a deeper understanding of the intricate dynamics between attachment styles, academic performance, and mental well-being. Notably, we anticipate our findings will aid future research in evaluating the potential efficacy of attachment-informed campus services. These findings and recommendations could have implications for McMaster facilities that provide student welfare, such as the Student Wellness Centre, Maccess, and Student Accessibility Services. Although previous findings on the efficacy of attachment-informed services are speculative, our research serves as a stepping stone for further research on the subject.

Concluding Statements

By examining the relationship between attachment styles, academic performance, and mental health among undergraduate students, we have built upon previous research to develop a better understanding of how these variables intersect in the specific context of university life. We hope future research expands on our findings, especially in the context of attachment-informed services for students. Despite the various limitations in this study, it still serves as a stepping stone for future research toward more accurate academic and mental health services for university students. Ultimately, it is imperative to create inclusive and effective university support services to foster the academic, social, and emotional success of students.

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Exploring the Impact of Parenting Styles on the Well-Being of McMaster University Undergraduate Students

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Abstract

Parenting styles and their influence on children's well-being have been a longstanding topic of interest in the field of social psychology. Although many studies indicate positive associations between responsive parenting and well-being and negative associations between demanding parenting and well-being, little research analyzes this correlation in emerging adults. The current study used a mixed-methods approach to examine the extent to which caregiver responsiveness and demandingness impacted the psychological well-being of McMaster University students, using self-acceptance, positive relations with others, environmental mastery, purpose in life, personal growth, and autonomy, Carol Ryff's (1989) six dimensions of well-being to understand psychological well-being. Participants (*N* = 57) were primarily Caucasian female students in their fourth year who completed quantitative scales and a qualitative open-ended question in an online anonymous survey. This survey measured participants' ratings of their caregivers' responsiveness and demandingness, as well as their ratings on the six dimensions of well-being. Our findings revealed that caregiver responsiveness was positively correlated with overall well-being, autonomy, environmental mastery, and personal growth. Caregiver demandingness revealed no significant relationships with well-being. This study serves to fill the gap in existing literature regarding how parenting styles impact the well-being of emerging adults.

Introduction

As students in social psychology, we have explored various factors that can affect well-being, the origin of these effects, and their manifestations in later life. Throughout the course of childhood, family plays a pivotal role in shaping a child's development and socialization within the world. In particular, parenting styles can drastically influence a child's behaviour, attitudes, and decisions. These learned characteristics persist throughout an individual's life and are essential for understanding how and why people feel the way they do. As such, this research study aims to understand how parenting styles affect young adults' psychological well-being.

Social Psychological Context

Our study is guided by established social psychological theories and concepts that we found relevant to exploring parenting styles on well-being. The first theory that guides our

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research is John Bowlby's (1958) attachment theory, which posits that relationships formed during infancy influence an individual's well-being throughout life. Additionally, Edward Deci and Richard Ryan's (2008) self-determination theory adopts a holistic lens to explain motivation, which serves as a required variable to obtain a state of well-being. Self-determination theory is the second framework discussed throughout our paper to guide our research and explain our findings.

Problem and Purpose of Research

While existing literature widely covers the impacts of parenting styles on well-being, it primarily concentrates on children and adolescents as the target demographic. Our thesis project aimed to fill the gaps in the existing literature by researching the impact of perceived parenting styles on Carol Ryff's (1989) six dimensions of well-being in emerging adults. Simultaneously, we hoped to bring more knowledge to participants, parents, and future research. Through our research process, we aimed to aid participants in self-reflection. This project could help participants understand themselves on a deeper level, specifically, how their caregiver's perceived parenting style has translated into their adult psychological well-being. Acquiring knowledge about this topic could assist our generation with future parenting attitudes and behaviours. This is because learning about the positive and negative impacts of parenting styles on well-being could encourage participants to make informed decisions about their future parenting choices. In addition, we hope our survey gave participants a safe space to share their lived experiences and express their feelings free of judgement and other emotional consequences. By fostering open dialogue, we aimed to enhance our comprehension of the connection between parenting styles and Ryff's (1989) dimensions of well-being in emerging adults.

Research Question

Our research question was, "How do parenting styles impact psychological well-being in McMaster undergraduate students in terms of autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance?" (Ryff 1989). The topic under investigation has primarily been studied in child and adolescent populations; thus, our research aimed to analyze this area in emerging adult populations using McMaster undergraduate students. Parenting styles and their influence on psychological well-being is an area of interest to everyone who is part of this research. Therefore, we selected this question to comprehensively analyze this concept and address the existing gaps within the current literature.

Overview of Paper

For a concise flow to our paper, we thoroughly explain John Bowlby's (1958) attachment theory and Edward Deci and Richard Ryan's (2008) self-determination theory, which have guided our research. Next, the literature review section of this paper will define parenting styles and the six dimensions of well-being, followed by an exploration of the relationship between the two. The four parenting styles are authoritative, authoritarian, permissive, and neglectful, each determined by the extent to which a parent exhibits responsiveness and demandingness (Baumrind, 1966; Maccoby & Martin, 1983). In the context of this study, Carol Ryff's (1989) six dimensions of well-being are used to explore this complex concept. These six dimensions include self-acceptance, positive

relationships with others, autonomy, environmental mastery, purpose in life, and personal growth (Ryff, 1989). In the methodology section of our paper, we provide a detailed outline of the procedures employed in our research study, along with any ethical considerations and risk mitigation strategies. Following this, we summarize the study results through graphs, figures, and text. Our paper concludes by discussing the broader significance of our results, the limitations of the study, and our final thoughts.

Theoretical Frameworks

Attachment Theory

The first foundational theory discussed throughout this thesis paper is attachment theory, coined by psychoanalyst and psychiatrist John Bowlby (1958). *Attachment* is a social-psychological, developmental, and ethological theory that describes the emotional bonds and interpersonal relationships infants share with their primary caregivers (Bowlby, 1958; Fletcher & Gallichan, 2016). The theory provides valuable insight into attachment dynamics and has implications for understanding and supporting healthy emotional development and relationships (Fletcher & Gallichan, 2016).

The concept of attachment first originated following Bowlby's (1958) research on the adverse effects of maternal deprivation on infants. His scholarly inquiry into attachment continued with the publication of two additional papers (Bowlby, 1959; Bowlby, 1960). A fundamental tenet of Bowlby's (1958) attachment theory is that attachment is an evolutionary process, reflecting an inherent drive within infants to establish bonds with primary caregivers to fulfill their basic human needs (Flaherty & Sadler, 2012). A significant contribution of Bowlby's (1988) research is his concept of internal working models, which begin developing in the first year of life when interactions with primary caregivers become internalized into one's mental blueprint. According to Fletcher & Gallichan (2016, p.13), Bowlby (1988) proposed that if caregivers are responsive, reliable, and trustworthy, a child will develop a secure internal working model where they feel "valued, accepted, and competent." Alternatively, if caregivers are unresponsive, unreliable, and untrustworthy, children will develop insecure internal working models, perceiving the self as "unacceptable, devalued, and incompetent" (Fletcher & Gallichan, 2016, p.13). A child utilizes their internal working model of their primary caregivers to guide expectations and behaviours in future relationships (Bowlby, 1988).

Mary Ainsworth, Bowlby's former colleague, is a key theoretician who expanded on his original attachment research by conducting a series of observational studies titled "The Strange Situation" (Ainsworth, 1963). This famous study involved analyzing the reactions of American infants aged 12-20 months after separating, then reuniting them with their mothers in a laboratory environment (Ainsworth, 1963; Ainsworth & Bell, 1970; Flaherty & Sadler, 2012). Researchers examined the infant's eagerness to explore, anxiety, and behaviours upon reuniting with their mother (Ainsworth, 1963; Ainsworth & Bell, 1970; Fletcher & Gallichan, 2016). Grounded in her observations from this study, Ainsworth (1963) derived three well-known attachment classifications: secure, avoidant-insecure, and anxious-ambivalent insecure (Ainsworth & Bell, 1970).

Among the infants observed in The Strange Situation, a significant majority, ranging from 65-70%, were classified as having secure attachments (Ainsworth, 1963). These infants initially experienced moderate distress when their mother left but gradually felt comfortable exploring the new environment and expressed happiness upon her return

(Ainsworth, 1963; Fletcher & Gallichan, 2016). The remaining 30-35% of infants exhibited either an avoidant-insecure or anxious-ambivalent insecure attachment style (Ainsworth, 1963). Those who displayed avoidant-insecure attachment showed no signs of distress when their mother left and minimal interest upon their reunion (Ainsworth, 1963). Conversely, infants characterized as anxious-ambivalent insecure were deeply distressed by separation, finding it challenging to be comforted upon their mother's return (Ainsworth, 1963; Fletcher & Gallichan, 2016).

According to Bowlby (1988), one's attachment style has a substantial influence on their psychological well-being in adulthood. Notably, attachment profoundly shapes an individual's self-acceptance, quality of relationships, and feelings of competence (Fletcher & Gallichan, 2016). Those who develop secure attachments during infancy exhibit heightened resilience, maintain positive interpersonal relationships with others, and experience increased self-acceptance as adults (Flaherty & Sadler, 2012; Fletcher & Gallichan, 2016). On the other hand, those who develop insecure attachments may have negative perceptions of themselves, struggle to form meaningful connections and be more susceptible to mental health challenges (Fletcher & Gallichan, 2016). Doinita and Maria (2015) suggest that a child's attachment style is closely linked to the parenting styles of their caregivers. Given this profound relationship, attachment theory will be referenced as a framework to investigate the influence of parenting styles on the psychological well-being of university students.

Self-Determination Theory

In addition to attachment theory, which lays the foundation for understanding parent-child relationships, we also analyze the impact of parenting styles on well-being through self-determination theory. Theorized by psychologists Edward Deci and Richard Ryan (2008), this macro approach aims to explain the inter- and intra-personal conditions that affect an individual's motivation and, in turn, quality of life. More specifically, self-determination theory looks at three domains that facilitate motivation and predict well-being: competence, relatedness, and autonomy (Deci & Ryan, 2008). Through this lens, we can address the external factors that affect personal issues: personality development, attainment of psychological needs, and social environments, all of which influence well-being.

It is essential to recognize the scope of this theory, as its application covers many areas of life (Deci & Ryan, 2008). Many other existing theories address human motivation, such as Maslow's hierarchy of needs; however, self-determination theory offers a unique perspective, taking a holistic approach to explain multiple variations of motivation. This allows for a more qualitative lens that we can use to predict "psychological health and well-being, effective performance, creative problem solving, and deep or conceptual learning" (Deci & Ryan, 2008, p.182). Furthermore, the most important distinction in this theory is between autonomous and controlled motivation, as both lead to vastly different results in the domains this theory analyzes (Deci & Ryan, 2008).

First, *autonomous motivation* can be defined as a combination of intrinsic and extrinsic motivation that arises when an individual voluntarily participates in activities they perceive as beneficial and integrates it into their self-concept (Deci & Ryan, 2008). Simply, it is motivation that stems from an individual's perceptions. In this study, we address the impact of parenting styles on an individual's decision-making process regarding what is

beneficial to them and how this is related to their overall well-being. In contrast, controlled motivation refers to external factors which either reward or punish an individual for their actions, motivating them to behave in a way that leads to approval and thus improved self-esteem (Deci & Ryan, 2008). Further, this approach aligns with behaviourism, attributing the other side of motivation to the human desire to seek external rewards and avoid punishment (Deci & Ryan, 2008). Taking self-determination theory into account, this tenet is helpful in linking parenting styles and motivation, subsequently impacting well-being. Covering internal and external factors, along with controlled and autonomous motivation, heavily contributes to the holistic approach self-determination theory takes to explain human motivation.

Understanding the influences of motivation is a foundational part of self-determination theory. However, as previously discussed, this theory also highlights the relationship between motivation and psychological well-being. Based on research across years and cultures, Deci and Ryan (2008) found that satisfying "needs for competence, autonomy, and relatedness do indeed predict psychological well-being in all cultures" (p.183). This finding is essential, as it addresses how both controlled and autonomous motivation affect how and whether individuals fulfill their psychological needs. Additionally, the authors recognize that individual differences in causality orientations influence how the three dimensions manifest themselves in psychological outcomes (Deci & Ryan, 2008).

Causality orientations can be broken down into autonomous, controlled, and impersonal orientations (Deci & Ryan, 2008). Self-determination theory asserts that these interact with one another and can predict psychological health outcomes (Deci & Ryan, 2008). To elaborate, the higher the level of autonomy orientation, the better the psychological health, while controlled and impersonal orientations are associated with poor well-being (Deci & Ryan, 2008). In addition to causality orientations, self-determination theory also explains motivation through people's long-term goals and aspirations. While the authors do not categorize these as essential needs, they note an association between intrinsic and extrinsic goals and increased overall well-being (Deci & Ryan, 2008). Thus, self-determination theory provides a comprehensive explanation of psychological well-being due to motivation.

Summary of Theoretical Frameworks

In summary, this research explores John Bowlby's (1958) attachment theory and Richard Ryan and Edward Deci's (2008) self-determination theory. While attachment theory analyzes the impact of early caregiver relationships on adult psychological well-being, self-determination theory examines the influence of motivation on the six dimensions of well-being. Through these theoretical frameworks, this paper aims to comprehensively understand the dynamics between early attachment experiences, motivation, and psychological well-being.

Literature Review

Well-Being Factors

Many studies demonstrate the relationship between parenting styles and child behaviour. However, our research explores parenting styles within the context of psychological well-being in emerging adults. Specifically, we use Professor Carol Ryff's (1989) core dimensions of psychological well-being: self-acceptance, purpose in life,

environmental mastery, positive relationships with others, autonomy, and personal growth. These defining features are developments built upon the work of various theorists, including Erikson, Allport, Rogers, Maslow, Jung, Jahoda, Birren, Bühler, and Neugarten (Ryff, 1995). Ryff (1995) critiques the frameworks these theorists created, stating that they "have had little impact on empirical research on psychological well-being" (p.99). In turn, she utilized elements of these theories to construct the six dimensions that pertain more to psychological well-being. However, Ryff (1995) recognizes that the purpose of these dimensions is to define key characteristics associated with well-being, as opposed to the existing plethora of scientific studies that are not founded in theory and attempt to quantify happiness (Ryff, 1995). Since its creation, numerous studies have incorporated these dimensions as a foundation for their research (Abbott et al., 2009). Focusing on the six dimensions is an effective way to assess moderate levels of well-being competently. However, the authors note that the level of precision falls when assessing high levels of well-being (Abbott et al., 2009). Our research considers these dimensions as we explore the link between undergraduate students' psychological well-being and parenting styles.

Parenting Styles

In social psychology, *parenting styles* is a term used to explain differences in parenting practices. In 1966, Diana Baumrind, a clinical psychologist specializing in child development, introduced the concept of three distinct parenting styles: authoritative, authoritarian, and permissive. Researchers Eleanor Maccoby and John Martin (1983) expanded on Baumrind's (1966) typology by categorizing parents based on the dimensions of responsiveness and demandingness. Responsiveness encapsulates a parent's ability to respond to a child's needs, promote individuality, and generate self-awareness (Maccoby & Martin, 1983). Demandingness is the degree to which a parent controls their child, emotionally or behaviourally (Maccoby & Martin, 1983). With this new framework, a fourth style, neglectful parenting, was introduced to the field of social psychology (Kuppens & Ceulemans, 2018; Maccoby & Martin, 1983).

Authoritative parenting is characterized by a high degree of responsiveness and demandingness, as parents promote a nurturing relationship by prioritizing support over punishment (Maccoby & Martin, 1983; Mendez & Sanvictores, 2022). While these parents have clear expectations and rules for their children, they are also receptive and patient, established by ongoing communication to promote long-term self-regulation skills (Maccoby & Martin, 1983; Mendez & Sanvictores, 2022). *Authoritarian parenting* is an approach that employs a power imbalance between a child and their parent due to a high degree of demandingness and a low degree of responsiveness (Maccoby & Martin, 1983; Mendez & Sanvictores, 2022). This parenting style emphasizes the strict adherence to rules without flexibility or exceptions, teaching children to behave according to their environment (Maccoby & Martin, 1983; Mendez & Sanvictores, 2022). This parenting style is associated with greater obedience. However, it also leads to lower self-esteem and decreased autonomy (Mendez & Sanvictores, 2022). Conversely, *permissive parenting* is described as high responsiveness with low demandingness, promoting equal power dynamics (Maccoby & Martin, 1983; Mendez & Sanvictores, 2022). This translates into children obtaining a high degree of freedom and independence, but as a result, they may lack crucial self-regulation skills (Maccoby & Martin, 1983; Mendez & Sanvictores,

2022). Lastly, Maccoby and Martin's (1983) *neglectful parenting* style describes parents who score low in both responsiveness and demandingness, meaning they employ minimal discipline, communication, and nurture. This results in self-sufficient children with low emotional regulation, poor social skills, and academic difficulties (Maccoby & Martin, 1983; Mendez & Sanvictores, 2022). Each distinct parenting style directly affects a child's upbringing, which determines their short and long-term attitudes and behaviours (Maccoby & Martin, 1983).

Parenting Styles and Ryff's Six Dimensions of Well-Being

Self-Acceptance

Self-acceptance is one of the six dimensions of Carol Ryff's (1989) well-being model. According to Ryff (1989), obtaining a high degree of self-acceptance and the other five dimensions promotes positive emotional and psychological well-being (Ryff, 1989). Yerdaw & Rao (2018), propose that optimal well-being is not exclusively characterized by the absence of negative factors but rather by the presence of essential personal traits (Yerdaw & Rao, 2018). Ryff (1989) explains that self-acceptance is a trait that allows an individual to obtain a sense of self-worth and actualization within the world without relying on external appraisal, thereby promoting positive well-being (Ryff, 1989). However, it is also essential to note that self-acceptance is attainable when taught and enforced at the early stages of child development (Ryff, 1989). Attachment and self-determination theories will further explain how and why self-acceptance, a trait fostered by particular parenting styles, contributes to enhanced psychological well-being.

Lathren et al., (2021) analyze the associations between parenting styles, attachment theory, and self-acceptance in achieving positive mental health. The authors propose the concept of self-compassion as a term that connects self-acceptance, self-esteem, and self-efficacy (Lathren et al., 2021). The study mentions that authoritative parenting styles promote positive and supportive environments, leading to engagement in self-compassionate behaviours (Lathren et al., 2021). An essential element of this research involved investigating the influence of parenting styles on a child's behaviour and its subsequent effects on mental health. They suggested that children who acquire self-compassion are more likely to have improved mental health outcomes (Lathren et al., 2021). However, learning self-compassion and self-acceptance stems from being raised in an environment high in responsiveness and supportiveness (Lathren et al., 2021).

Conversely, the authors indicate that in families low in supportiveness and responsiveness but high in dysfunction, it is unlikely for a child to acquire the traits required for practicing self-compassion and self-acceptance (Lathren et al., 2021). Attachment theory can also explain these results, as they suggest that secure attachment can co-develop with self-compassion and self-acceptance (Lathren et al., 2021). Attachment theory further suggests that children who exhibit secure attachment to their parents are often brought up by authoritative parenting, which leads to positive self-compassion and enhanced mental well-being (Lathren et al., 2021).

Roth et al., (2019) ground their research on self-determination theory to explain how parenting styles contribute to the positive development of emotion regulation in adolescents. Their study suggests that self-acceptance is learned when parenting styles align with autonomy-supportive characteristics (Roth et al., 2019). Autonomy-supportive behaviours, seen in authoritative parenting styles, manifest when parents unconsciously

teach their children self-sufficiency and emotional regulation through inadvertent guidance and observed behaviours. Consequently, when parents display accepting qualities, their children tend to internalize these traits, fostering self-acceptance and encouraging self-reflection (Roth et al., 2019). Controlling parents, linked to authoritarian parenting, are less open and accepting of their child's experiences, and this translates to children who are non-accepting of their feelings and emotions (Roth et al., 2019). This is explained by self-determination theory, which cites that emotion regulation is developed by learning and perseverance (Deci & Ryan, 2008). Therefore, when children are taught to be self-accepting by their parents, they must also learn to reinforce this trait within themselves. In turn, positive mental health is more likely to be maintained throughout the life course (Roth et al., 2019).

Overall, the way a child is raised by their parents determines how they regulate their emotions and perceive themselves. Attachment and self-determination theory explain how parenting can either support or hinder learning self-acceptance and how to uphold self-acceptance throughout life to maintain positive mental health.

Positive Relationships with Others

Positive relations with others are a fundamental component of psychological well-being, defined as one's ability to establish and maintain caring interpersonal connections (Ryff, 1989). According to Ryff (1989), the foundational traits necessary for forming positive relationships include empathy, trust, reliability, affection, and maturity. The development of these personal attributes is significantly influenced by the interplay of childhood attachment and parenting styles (Doinita & Maria, 2015).

This connection is supported by Neal and Frick-Horbury (2001), who analyzed the relationship between parenting styles and the development of positive relationships in undergraduate students. Participants included 56 students aged 18-22 who completed assessments focused on parenting practices and interactions with others (Neal & Frick-Horbury, 2001). A critical scale employed was the Relationship with Others (RO) scale (2011), which assesses one's availability, dependability, and attentiveness to needs (Neal & Frick-Horbury, 2001). The colleagues found that students with authoritative parents, associated with secure attachment styles (Zeinali et al., 2011), scored the highest on the RO scale (Neal & Frick-Horbury, 2001). In contrast, those with authoritarian parents, associated with avoidant-insecure attachment (Zeinali et al., 2011), scored low on the RO scale (Neal & Frick-Horbury, 2001). This demonstrates the significant influence of parenting styles on an individual's relationships with others, ultimately contributing to their psychological well-being.

The findings from the Neal and Frick-Horbury (2001) study regarding how authoritative and authoritarian parenting styles impact relations with others are well-supported by the work of Doinita and Maria (2015) and Yadav et al., (2021). However, there is a lack of consensus regarding whether permissive parenting styles positively or negatively impact the development of strong interpersonal relationships with others. While Neal and Frick-Horbury (2001) concluded that students raised by permissive parents achieve lower scores on the RO scale, Doinita & Maria (2015) and Yadav et al., (2021) indicate that this parenting style is associated with stronger relationships with others. The discrepancy in these findings will be explored in-depth during the analysis of our final thesis paper. The fourth parenting style, labelled as neglectful, has received significantly less research in

this field. With this being said, results found by Doinita & Maria (2015) implies that parents who are low in demandingness and responsiveness evoke attachment insecurity, consequently resulting in weaker relationships with others. Struggling to maintain relations with others is associated with decreased psychological well-being because these connections are essential sources of emotional support and provide individuals with a sense of relatedness (Doinita & Maria, 2015), one of self-determination theory's key domains (Deci & Ryan, 2008).

Overall, the results from these studies imply that the parenting styles one adopts heavily influence a child's attachment and internal working model, subsequently impacting their self-perception and feelings towards others. This complex interplay significantly contributes to the development of positive relationships with others, which is linked to enhanced psychological well-being (Ryff, 1989).

Environmental Mastery

According to Carol Ryff's (1989) six psychological well-being dimensions, environmental mastery pertains to an individual's capacity to shape or select environments that complement their mental state and allow personal advancement. This dimension of well-being examines how well an individual can modify and take advantage of opportunities within their environment (Ryff, 1989). Compared to the other facets that make up Carol Ryff's (1989) well-being dimensions, environmental mastery is the least researched, demonstrating a limitation within the existing literature. Subsequently, most research examining environmental mastery combines its analysis with other dimensions of well-being.

The existing literature discussing environmental mastery explores how parenting styles affect the development of this dimension among young adults. This research supports the argument that an authoritative parenting style positively correlates with environmental mastery (Yadav et al., 2021). For example, Segrin et al., (2022) examined how overparenting and maladaptive family communication traits associated with an authoritarian parenting style affect the well-being of emerging adults. As mentioned previously, authoritarian parenting is an approach that employs a power imbalance between a child and their parent due to a high degree of demandingness and low degree of responsiveness (Mendez & Sanvictores, 2022). The study found that parents who employ these overparenting practices become too involved in decision-making processes, risk management, and directing their children's lives (Segrin et al., 2022). Ultimately, the colleagues concluded that this authoritarian style has no beneficial outcomes; instead, it inhibits a child's environmental mastery and psychological well-being (Segrin et al., 2022).

In addition, Kamrani and Malik (2014) examined the impact of traits associated with an authoritative style on environmental mastery and well-being. Specifically, the colleagues examined how mothers' warmth, a trait compatible with an authoritative parenting style, affects environmental mastery. The results indicated that the mother's warmth directly impacted environmental mastery (Kamrani & Malik, 2014). Yerdaw and Rao (2018) support these findings by stating that when parents practice warmth and supportive parenting, their children experience higher rates of psychological well-being. Mendez and Sanvictores (2022) argue that this outcome can be attributed to parents maintaining clear expectations and rules for their children and demonstrating receptiveness and patience.

These qualities are fostered through consistent communication to encourage the development of long-term self-regulation skills (Mendez & Sanvictores, 2022).

As displayed from the existing literature, it is clear that authoritative parenting is positively correlated with achieving environmental mastery and well-being. Environmental mastery requires that an individual is given the support and discretion to take advantage of their environment and make creative changes to best suit their mental state (Ryff, 1989).

Purpose in Life

According to Carol Ryff's (1989) six psychological well-being dimensions, purpose in life outlines the encompassing aspects of maturity, directedness, intentionality, and mental health. It is described as the variety of evolving life goals and overall emotional integration (Ryff, 1989). In essence, if one has goals, intentions, and a sense of direction, there is a higher likelihood of a persistent feeling of purpose in life (Ryff, 1989). Research has examined how familial relations, particularly parenting styles, contribute to the stability of adolescent behaviour and psychological well-being throughout the lifespan. One example is in the Francis et al., (2020) study, which assessed the correlation between psychological well-being and parenting styles (Francis et al., 2020). The authors conducted a correlational survey in five Southern Indian schools, with 554 adolescent participants in eighth and ninth grade (Francis et al., 2020). The collection of data was adopted from the use of a self-administered perceived parenting scale and a Ryff (1989) scale for psychological well-being assessment (Francis et al., 2020). Upon data collection, psychological well-being, specifically purpose in life, was found to have a positive relationship with authoritative parenting (Francis et al., 2020). The authoritative parenting style, based on its support and stability, fostered purpose in life and positive relationships with others (Francis et al., 2020). Opposingly, a negative correlation was found between purpose in life and neglectful parenting (Francis et al., 2020).

Bringing forth similar findings, Ortega et al., (2021) focus on examining the differences between maternal and paternal parenting styles and how these affect emotional outcomes in early adolescents (Ortega et al., 2021). The sample included 744 children, with 45.8% being in fifth grade and the other 54.2% being in sixth grade (Ortega et al., 2021). The measures included several scales, for example, the Affect Scale (1999; measuring affect, communication and parental criticism/rejection), the Rules and Demandingness Scale (1999; measuring how parents establish rules and expect them to be followed), the PROMIS Depression Short Form Scale (2011; measuring hope, optimism, purpose in life and goal orientation), and other scales of the same subject matter. Upon data collection, the study revealed that both mothers' and fathers' affect and communication (consistent with authoritative parenting) positively correlated with purpose in life, while it negatively correlated with depression and anxiety (Ortega et al., 2021). Furthermore, perceived affect was deemed a protective factor in preventing anxiety and depression, whereas perceived criticism and rejection (consistent with authoritarian and neglectful parenting) were considered to be risk factors for feelings of purpose in life (Ortega et al., 2021). Parental affect was positively associated with feelings of purpose, such as the ability to reach goals and feeling like life is logical and worthy (Ortega et al., 2021). This finding also appears prominent in the relation between parental warmth,

associated with authoritative parenting, and overall higher life satisfaction (Ortega et al., 2021).

Altogether, the literature continuously emphasizes that the fundamental traits of the four parenting styles (affect, communication, criticism, and rejection) and overall perceived parenting styles have a strong effect on adolescents' emotional well-being, specifically, their perceived sense of purpose in life (Ortega et al., 2021).

Personal Growth

According to Carol Ryff's (1989) six psychological well-being dimensions, *personal growth* encompasses the continual positive development of one's potential and the ability to adapt in ways that reflect greater effectiveness and self-knowledge. Subjectively, numerous factors can be associated with this well-being domain, including anxiety, motivation, self-regulation, academic success, and more. Research has investigated parenting styles' influence on many of the components associated with personal growth. Several studies analyze the relationships between undergraduate students' anxiety levels, academic success, and their parents' parenting styles, highlighting numerous mediating variables, including self-regulation, stress, depression, and motivation (Barton & Kirtley, 2012; Silva et al., 2007).

As an example, Barton and Kirtley's (2012) research on undergraduate students' levels of anxiety, stress, and depression about their parents' parenting styles highlights differences in male and female students. The findings demonstrate that maternal permissiveness is positively associated with stress and anxiety in female students. In contrast, paternal authoritarianism is positively associated with stress in male students, leading to the development of depression symptoms in both males and females (Barton & Kirtley, 2012). Additionally, maternal authoritativeness was negatively associated with anxiety and depression in female students, while paternal authoritativeness was negatively associated with depression in male students (Barton & Kirtley, 2012). Interestingly, maternal and paternal authoritarianism had no significant relationship with the variables for female students, and both maternal and paternal permissiveness had no relationship with the variables for male students (Barton & Kirtley, 2012). Transitioning into college and university often comes with many stressors for students, and therefore, successful navigation requires good self-regulation and a strong sense of support (Barton & Kirtley, 2012). Mother's permissive parenting likely inhibited daughters' self-regulation, increasing their stress and anxiety during their transition into college (Barton & Kirtley, 2012). Correspondingly, a father's authoritarian parenting likely caused sons to feel a lack of support, thereby also increasing their stress during this transition (Barton & Kirtley, 2012). Successful navigation of this difficult transition will allow for optimal personal growth, and authoritative parenting seems to have the highest positive outcomes on students' ability to thrive in their new college environment (Barton & Kirtley, 2012).

Likewise, Silva and colleagues' (2007) research on college students' anxiety, motivation, and academic achievement about their parents' parenting styles found similar results. Maternal authoritarianism was positively correlated with students' anxiety levels and negatively correlated with their grade point average (GPA) in college (Silva et al., 2007). Paternal authoritativeness was negatively correlated with students' anxiety levels, and maternal authoritativeness was positively associated with students' college GPA (Silva et al., 2007). The researchers suggest that students' motivation is a mediator for

anxiety and academic achievement in college, proposing that students' anxiety was associated with their motivation, which, in turn, was associated with their academic achievement (Silva et al., 2007). Seeing that the mother's authoritarian parenting was yielding higher anxiety levels and lower GPAs among students, we can assume that this was negatively affecting students' motivation. According to self-determination theory, motivation facilitates well-being (Deci & Ryan, 2008). Therefore, more significant anxiety in students resulted in less motivation, thus decreasing academic achievement and ultimately lowering students' psychological well-being. Additionally, higher levels of anxiety, lower levels of motivation, and lower levels of academic achievement can inhibit students' ability for personal growth (Ryff, 1989, 1995). This leaves them feeling personal stagnation and the inability to see improvement in themselves, their skills, and their behaviours over time (Ryff, 1989, 1995).

In general, parental authoritativeness is significantly negatively associated with students' anxiety levels, whereas parental authoritarianism and permissiveness are significantly positively associated with students' anxiety levels (Barton & Kirtley, 2012; Silva et al., 2007). Neither of the studies mentioned neglectful parenting and its impacts on well-being. With a lack of sense of support from their parents, students are prone to experience higher levels of anxiety, stress, and depression, along with lower levels of motivation and self-regulation (Barton & Kirtley, 2012; Silva et al., 2007). In combination, these can negatively influence students' academic success and their ability to thrive in their changing environments, altering their personal growth during these emerging adulthood years.

Autonomy

Much research has demonstrated the complex role parenting styles play in human development. A substantial aspect of development involves acquiring independence, which ultimately dictates one's life and, consequently, their well-being. Embedded within this concept lies Ryff's (1989) notion of *autonomy,* one of the six dimensions of psychological well-being. Although the concept of autonomy has been developed into many different definitions by numerous theorists and researchers (Adams & Berzonsky, 2006), at its core, it can be defined as "such qualities as self-determination, independence, and the regulation of behaviour from within...does not look to others for approval, but evaluates oneself by personal standards" (Ryff, 1989, p.1071). Developing a healthy level of autonomy is crucial to psychological well-being; too little can result in regressed adulthood states, and too much can damage an individual's social and psychological well-being (Adams & Berzonsky, 2006). For example, those who experience overparenting and a lack of autonomy, in relation to attachment theory, can experience unstable relationships and insecure attachment due to increased anxiety and avoidance (Jiao & Segrin, 2022). Self-determination theory maintains this idea by examining what factors (i.e., parenting styles) influence motivation that enable individuals to meet their psychological needs, with autonomy as a principal foundation (Deci & Ryan, 2008). The current literature effectively demonstrates the strong influence of parenting styles on how adolescents develop autonomy and the positive relationship between autonomy and psychological well-being (Ryff, 1989).

Across research studies, authoritative parenting has proven to have the best outcomes for children regarding autonomy and, subsequently, psychological well-being (Yerdaw &

Rao, 2018). By allowing children to experience more independence, within reason, authoritative parents are simultaneously enabling them to regulate their behaviour and activities on their own, contributing to their sense of autonomy (Yerdaw & Rao, 2018). Looking retroactively, Ryan, Deci, and Grolnick (1995) further this idea, stating that for autonomy support, it is essential to encourage children to problem-solve and give them choices with a helping hand (Adams & Berzonsky, 2006). As mentioned previously, autonomy is characterized by a strong, individualized sense of self, personal principles, and internal regulation (Adams & Berzonsky, 2006). Through proper authoritative parenting, adolescents can build a crucial foundation for autonomy, which they can expand upon throughout their lifetime (Adams & Berzonsky, 2006). Over generations, literature has consistently supported that the elements of authoritative parenting are key to adolescents successfully gaining autonomy.

Contrasting authoritative parenting, which is the most successful in cultivating autonomy in adolescents (Adams & Berzonsky, 2006), other parenting styles can adversely affect how autonomy develops. Notably, it becomes problematic when children live with overbearing parents, as the more controlling and involved the parent is, the more issues children face in developing their independence (Jiao & Segrin, 2022). This is in accordance with a more authoritarian style of parenting, which restricts the child from developing their independence and negatively affects their psychological well-being (Yerdaw & Rao, 2018). By utilizing coercion or psychological control, the child is bound to feel constrained and controlled to behave in a certain way, reducing their level of autonomy (Adams & Berzonsky, 2006). Additionally, while the work of Jiao and Segrin focuses on overparenting, underparenting, or permissive parenting, it also has implications for adolescent autonomy development (Yerdaw & Rao, 2018). As mentioned previously, too much autonomy can be problematic for well-being, and parents who allow their children ultimate autonomy foster an environment for this to occur (Yerdaw & Rao, 2018). Although there may be cases in which autonomy prevails in these parenting styles, the existing literature demonstrates the negative relationship between these types of parents and the levels of autonomy in adolescents.

It is important to recognize the emphasis current research places on how parenting styles affect adolescents in terms of Ryff's (1989) six dimensions of well-being. Additionally, the existing research predominantly focuses on these relationships within adolescents. This provides an above satisfactory explanation of autonomy in its developing stages and provides reason which can be applied to well-being. Maccoby & Martin (1983) as cited, theorized that autonomy develops in three stages; "parental regulation of children...increasing co-regulation between children and parents, eventual self-regulation" (Adams & Berzonsky, 2006, p.192). Additionally, autonomy is a key component of self-determination theory, stating that humans' functionality is based on their levels of autonomy (Deci & Ryan, 2008). Our research examines how emerging adults can maintain this self-regulation and if those who did not experience authoritative parenting in adolescence could still attain autonomy. Furthermore, it analyzes whether adolescents who attain autonomy (among the other well-being factors) due to their parental influence will continue to develop and maintain this foundation as they progress into other stages of life.

Limitations of Current Literature

There is a great amount of research on parenting styles and their influence on the psychological well-being of children, however, there are gaps in existing literature relating parenting styles to the well-being of emerging adults. As well, little research has directly measured the impact of parenting styles on Carol Ryff's (1989) six dimensions of psychological well-being. Our study aimed to fill in these gaps to obtain an understanding of how parenting styles influence the psychological well-being of emerging adults in the McMaster undergraduate community, specifically relating to autonomy, environmental mastery, self-acceptance, purpose in life, positive relations with others, and personal growth (Ryff, 1989).

Furthermore, much of the existing literature on parenting styles seems to disregard neglectful parenting, primarily focusing on authoritative, authoritarian, and permissive styles (Barton & Kirtley, 2012; Silva et al., 2007). This is a limitation of current research because neglectful parenting represents a parenting style that can significantly affect one's well-being. Our study included all four parenting styles, aiming to bridge the knowledge gaps regarding the impact of neglectful parenting on psychological well-being.

Lastly, it is imperative to acknowledge that the conclusions drawn from this literature review may not be generalizable to cultures beyond North America. The influence of cultural values plays a significant role in determining the psychological outcomes associated with the four parenting styles (Peterson et al., 2005). These variations highlight the importance of considering the context in which parenting practices and their impacts are examined and were taken into consideration when analyzing our research findings.

Literature Review Summary

This literature review explores the intricate relationship between parenting styles and psychological well-being, focusing primarily on emerging adults. The findings underscore the significance of authoritative parenting, characterized by a high degree of responsiveness and supportiveness, in fostering positive outcomes across all dimensions of psychological well-being. Conversely, authoritarian, permissive, and neglectful parenting styles exhibit varying degrees of impact on individual well-being, often resulting in challenges such as decreased autonomy, lower self-esteem, and impaired interpersonal relationships. This exploration of literature also highlights several notable limitations in current research, such as the lack of focus on emerging adults and the tendency to overlook the impacts of neglectful parenting.

Methodology

Research Question

This research study aimed to answer the question: "How do parenting styles impact psychological well-being in McMaster undergraduate students in terms of autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance?"

Ethical Considerations

Our study posed minimal risks for participants, including no physical risks or any possible risks that are greater than those participants might encounter in their everyday

lives. However, some potential psychological and social risks associated with our study were communicated to participants in our survey's preamble and consent section.

Psychological Risks

The psychological risks included possible feelings of embarrassment, discomfort, and worry during survey completion. These reactions might have occurred if the survey questions evoked distressing thoughts or brought up traumatic childhood experiences, potentially impeding the participant's psychological well-being and ability to complete the survey.

Social Risks

Furthermore, participants might have encountered social risks, including potential compromises in privacy, reputation, or status arising from their engagement in the online survey. Regarding privacy, there was a possibility that participants who completed the study in a public setting, thereby exposed private responses on their devices to others. Additionally, if an individual liked or responded to a post related to our survey, their identity could have been revealed, which could result in a negative shift in the participant's reputation and/or status.

Ethical Risk Management Strategies

We have devised several risk management strategies to minimize participants' potential psychological and social risks.

Psychological Risk Strategies

To reduce psychological risks, an online, anonymous survey ensured that participants could share their thoughts, feelings, and experiences without fearing judgment or repercussions. In addition, we provided details on how to access support resources on both the letter of information and the concluding page of the survey. This placement encouraged participants to access mental health support if they experienced any feelings of embarrassment, discomfort, or worry while completing the survey. Finally, participants were allowed to withdraw from the survey at any time before submission with the assurance that their information would not be saved. This allowed participants to withdraw from the study if they experienced negative feelings, ensuring we prioritized their well-being throughout the research process.

Social Risk Strategies

In addition to psychological risk strategies, we also utilized strategies to manage potential social risks associated with completing our survey. First, we designed the study to be completely anonymous and online so that participants were not identifiable. This guaranteed that the survey results did not have any connections to participants' identity markers, ensuring their responses were safe and confidential. Moreover, we asked participants to complete the survey in a personal space and to avoid engaging with or responding to posts regarding details about the survey. This was to prevent other individuals from observing the completion of their survey to minimize potential harm to their status and/or reputation. Finally, all survey questions are below minimal risk, meaning they posed no greater harm than participants would experience in everyday life.

Survey Development

To examine the impact of parenting styles among McMaster University undergraduate students, we conducted an online anonymous survey on the MREB-approved software LimeSurvey. The research study was approved by the McMaster Research Ethics Board (MREB #0327). The survey consisted of 47 questions about participants' perceptions of their parents' parenting style and their own perceived psychological well-being. Parenting style questions were based on the English validated Parental Socialization Scale ESPA29 (Martinez et al., 2017), using a 4-point Likert scale (1 = "never", 4 = "always"), with a fifth answer option being "non-applicable" (N/A). Psychological well-being questions were based on Carol Ryff's (1989) six dimensions of psychological well-being (self-acceptance, positive relations with others, environmental mastery, autonomy, purpose in life, and personal growth), using a 5-point Likert scale (1 = "strongly disagree," 5 = "strongly agree") to measure each dimension of well-being. One open-ended question asked participants to describe how they feel their caregivers' parenting style(s) have impacted their psychological well-being. The last seven questions pertained to demographic information about the participants' year of study, program, faculty, GPA, gender identity, age, and ethnic identity.

Recruitment

After obtaining ethics approval, we began recruiting participants on November 27th, 2023. The sampling methods used included convenience and snowball sampling. To recruit participants, we emailed five McMaster Student Union-approved clubs and associations, including The Social Psychology Society, the McMaster Social Sciences Society, the Health, Aging and Society Student Association, the Sociology Society, and the Anthropology Society. Each student investigator actively participated in drafting and sending emails to recruit participants.

Survey Procedure

If participants voluntarily decided to complete our survey, they would first have the opportunity to read through the letter of information on the preamble and consent page. The letter of information outlines the principal investigator, undergraduate student investigators, purpose of the study, procedures involved in the research, potential harms, potential benefits, confidentiality, the right to withdraw, and information about the study results. Additionally, the letter of information outlined the approximate length of the survey (15-20 minutes). After participants read the letter of information, they were presented with two options: 1) Yes, they consent to participate in the research, or 2) No, they do not consent to participate in the research. Once participants selected option 1, they then had access to complete the survey.

Data Collection

The survey commenced on November 27th, 2023, and closed on February 16th, 2024. The study was designed with the initial goal of securing 80 survey responses. However, when the survey closed, 273 responses were received, of which 214 were partial responses and 59 were deemed fully completed. Two of the 59 fully completed responses were excluded from the sample due to the participants' inability to pass the attention

check question, establishing a final sample size of 57 (N = 57). Following the survey closure, all participant data was stored securely, concluding the data collection procedure for this study.

Challenges to Data Collection and Analysis

Throughout our data collection process, we encountered several challenges. First, we had a limited timeframe to recruit participants from November 27th, 2023, until February 16th, 2024. This restricted time frame hindered our ability to collect a large number of participants, which would have enhanced our study's generalizability and external validity. Additionally, as a part of our recruitment efforts, we contacted various student-run clubs and associations, seeking their collaboration in promoting our survey on their social media platforms. Unfortunately, a considerable number of these organizations did not respond to our emails, which significantly reduced the number of participants we could secure. Moreover, during data collection, our participants may have engaged in sloppy or dishonest responding due to fatigue or a lack of interest. Such behaviours could have introduced biases into our dataset, reducing the reliability of our findings. However, we strategically included an attention check question halfway through our survey, saying "This is an attention check question. Please select Disagree for this question." During data analysis, we removed any participant responses that failed to pass this question.

Data Analysis

The data analysis process began following the closure of our survey on February 16th, 2024. We transferred all qualitative responses from LimeSurvey to an OMV file compatible with a statistical software called Jamovi. Subsequently, we utilized this platform to analyze the quantitative data gathered from Likert scale questions. Additionally, we used an inductive codebook approach to interpret the qualitative responses provided from the open-ended question on the survey. This method allowed us to systematically categorize and analyze recurring themes within the data to better understand how parenting styles affect psychological well-being.

Data Collection and Analysis Timeline

Task	**Date**
Create drafts to email student-run clubs and associations for recruitment	October 19th, 2023
Survey opens	November 27th, 2024
Send emails to student-run clubs and associations for recruitment	December 2023 to January 2024
Send follow-up emails to student-run clubs and associations for recruitment	February 12th-14th, 2024
Survey closes	February 16th, 2024

Data analysis begins	February 17th, 2024
Data analysis completion	March 5th, 2024

Summary of Methodology

In summary, the methodology in this study aimed to investigate the influence of parenting styles on McMaster University undergraduate students' psychological well-being. We created an online anonymous survey using the LimeSurvey software, approved by the McMaster Research Ethics Board (MREB #0327). The survey encompassed 47 questions related to participants' perceptions of their parents' parenting style and their own psychological well-being, measured through established scales. The recruitment process involved convenience and snowball sampling, resulting in 57 completed responses after exclusions. Data analysis involved quantitative coding on Jamovi and an inductive codebook approach to analyze qualitative data, aiming to elucidate recurring themes regarding the impact of parenting styles on psychological well-being.

Results

Participant Demographics

A total of 59 McMaster undergraduate students completed our survey, however, 2 participants failed the attention check question and were therefore removed from the population (N = 57). Out of the 57 participants, 38 (66.7%) identified as female, 18 (31.6%) identified as male, and 1 (1.8%) identified as non-binary, with 3 (5.3%) being 18 years-old, 1 (1.8%) being 19 years-old, 1 (1.8%) being 20 years-old, 45 (78.9%) being 21 years-old, 2 (3.5%) being 22 years-old, 4 (7%) being 23 years-old, and 1 (1.8%) being 25+ years-old. The majority of the participants reported being in the fourth year (7% in the first year, 1.8% in the second year, 12.3% in the third year, 75.4% in the fourth year, and 3.5% in the fifth year). Six faculties were reported across all 57 participants: Social Sciences (39.3%), Science (19.6%), Engineering (14.3%), Health Sciences (7.1%), Business (12.5%), and Humanities (7.1%). The most common program participants reported being in was Social Psychology (17.5%). Participants were asked to report their ethnicity in an open-ended response, thus the results were sorted into the following broad categories: Caucasian (66.7%), European (10.5%), South-West Asian (3.5%), South Asian (3.5%), Chinese (3.5%), Middle-Eastern (1.8%), South-East Asian (1.8%), Latino (1.8%), Russian (1.8%), Indigenous (1.8%), Multiethnic (1.8%), and Did Not Answer (1.8%).

Well-Being and Parenting Style

Table 1 presents Pearson's correlations of caregiver responsiveness and overall well-being. Caregiver responsiveness (M = 3.1, SD = 0.56) was found to have a significant positive correlation with overall well-being (M = 3.6, SD = 0.45). Tables 2, 3, and 4 outline the significant positive correlations between caregiver responsiveness and autonomy (M = 3.2, SD = 0.67), environmental mastery (M = 3.3, SD = 0.77), and personal growth (M = 3.8, SD = 0.54), respectively. Interestingly, there were no significant correlations between caregiver responsiveness and self-acceptance, positive relations with others, and purpose in life ($p > 0.05$).

Table 1
Correlation Matrix: Responsiveness x Overall Well-Being

		Responsiveness	Well-Being
Responsiveness	Pearson's r	—	
	p-value	—	
Well-Being	Pearson's r	0.428***	—
	p-value	<.001	—

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

Table 5 demonstrates Pearson's correlations of caregiver demandingness and overall well-being. Caregiver demandingness (M = 2.0, SD = 0.72) had a negative correlation with overall well-being (M = 3.6, SD = 0.45), however, this correlation was not statistically significant ($p > 0.05$). None of the six dimensions of well-being showed significant correlations with caregiver demandingness: Autonomy (r = -0.17, p = 0.195), self-acceptance (r = 0.09, p = 0.528), positive relationships (r = -0.01, p = 0.970), environmental mastery (r = 0.10, p = 0.462), purpose in life (r = 0.08, p = 0.577), and personal growth (r = -0.12, p = 0.388).

Gender Differences
We used linear regressions to analyze gender differences between well-being and parental responsiveness/demandingness. Figure 1 revealed that higher ratings of caregiver responsiveness were significantly associated with greater well-being (β = 0.44, p = 0.002), and participants who identified as non-binary had a higher likelihood of having greater well-being after rating their caregiver as more responsive. However, these gender differences were insignificant (p = 0.66). Figure 2 presents that caregiver demandingness would have been associated with lower well-being, but the data is insignificant (β = -0.11, p = 0.417). Additionally, those who identified as non-binary had a higher likelihood of having lower well-being after rating their caregiver as more demanding, however, these gender differences were also insignificant (p = 0.532).

Table 2
Correlation Matrix: Responsiveness x Autonomy

		Responsiveness	Autonomy
Responsiveness	Pearson's r	—	
	p-value	—	
Autonomy	Pearson's r	0.333*	—
	p-value	0.011	—

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

Table 3
Correlation Matrix: Responsiveness x Environmental Mastery

		Responsiveness	Environmental Mastery
Responsiveness	Pearson's r	—	
	p-value	—	
Environmental Mastery	Pearson's r	0.464***	—
	p-value	<.001	—

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

Furthermore, we utilized chi-square tests to observe gender differences in autonomy, environmental mastery, and personal growth ratings. Table 6 reveals that out of the 38 participants who identified as female, 21 (55.3%) had high autonomy, and 17 (44.7%) had low autonomy. Out of the 18 respondents who identified as male, 12 (66.7%) had high autonomy, and 6 (33.3%) had low autonomy. There was only 1 participant who identified as non-binary, and they had low autonomy (100%). However, these results are insignificant: $X^2(1) = 2.05$, $p = 0.359$.

Table 7 outlines differences in environmental mastery by gender, highlighting that out of the 38 respondents who identified as female, 22 (57.9%) had high environmental mastery and 16 (42.1%) had low environmental mastery. Out of the 18 respondents who identified as male, 15 (83.3%) had high environmental mastery, and 3 (16.7%) had low environmental mastery. The 1 participant who identified as non-binary had low environmental mastery (100%). These results are also statistically insignificant: $X^2(1) = 5.35$, $p = 0.069$.

Lastly, Table 8 analyzes differences in personal growth by gender. Of the 38 female-identified participants, 33 (86.8%) had high personal growth and 5 (13.2%) had low personal growth. 16 (88.9%) male-identified subjects had high personal growth, and 2

Table 4
Correlation Matrix: Responsiveness x Personal Growth

		Responsiveness	Personal Growth
Responsiveness	Pearson's r	—	
	p-value	—	
Personal Growth	Pearson's r	0.303*	—
	p-value	0.022	—

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

Table 5
Correlation Matrix: Demandingness x Well-Being

		Demandingness	Well-Being
Demandingness	Pearson's r	—	
	p-value	—	
Well-Being	Pearson's r	-0.140	—
	p-value	0.298	—

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

(11.1%) had low personal growth. Finally, the 1 subject who identified as non-binary had high personal growth (100%). This data is also statistically insignificant: $X^2(1) = 0.190$, $p = 0.909$.

Ethnic Differences

In addition to gender, we were also interested in analyzing whether there were differences in ratings of caregiver responsiveness, demandingness, and overall well-being in terms of ethnicity. Linear regressions (Figure 3) revealed that Russian respondents were more likely to have higher ratings of overall well-being after rating their caregiver(s) as higher in responsiveness, but the data is insignificant ($p = 0.904$).

Figure 1
Well-Being x Responsiveness: by Gender

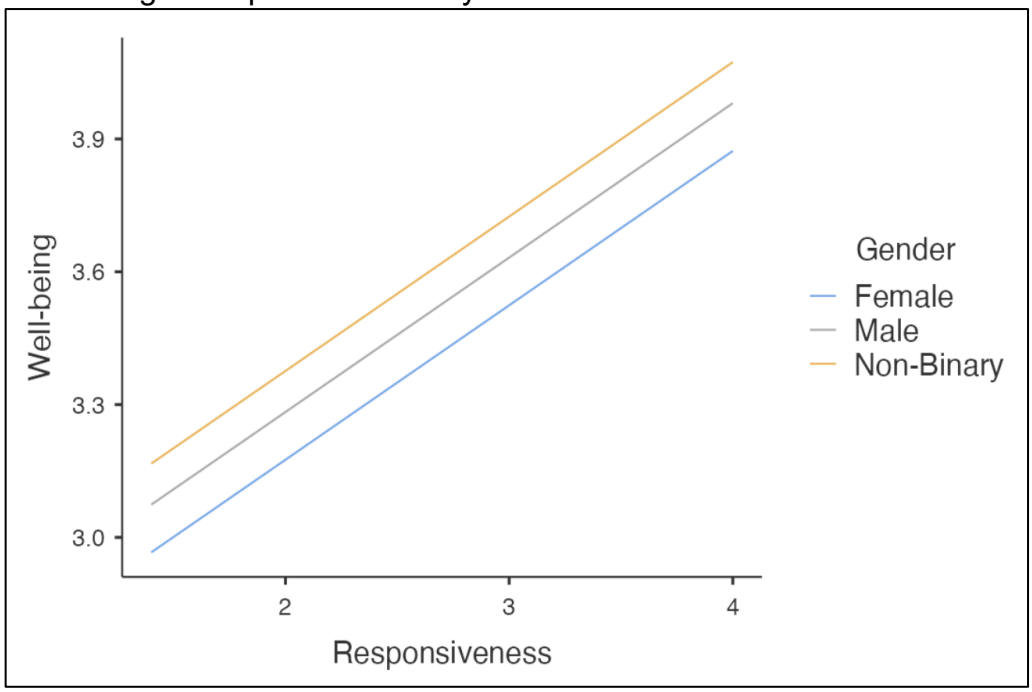


Figure 2
Well-Being x Demandingness: by Gender

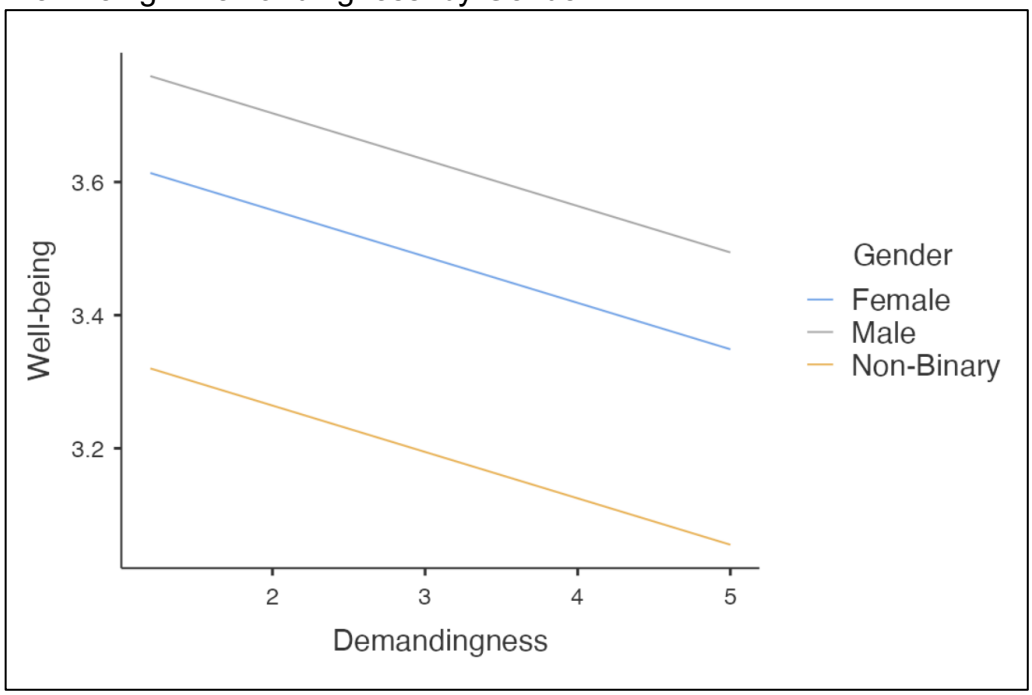


Table 6
Chi-Square Test: Autonomy x Gender

Gender		Autonomy		Total
		high autonomy	low autonomy	
Female	Observed	21	17	38
	% within row	55.3%	44.7%	100.0%
	% within column	63.6%	70.8%	66.7%
	% of total	36.8%	29.8%	66.7%
Male	Observed	12	6	18
	% within row	66.7%	33.3%	100.0%
	% within column	36.4%	25.0%	31.6%
	% of total	21.1%	10.5%	31.6%
Non-Binary	Observed	0	1	1
	% within row	0.0%	100.0%	100.0%
	% within column	0.0%	4.2%	1.8%
	% of total	0.0%	1.8%	1.8%
Total	Observed	33	24	57
	% within row	57.9%	42.1%	100.0%
	% within column	100.0%	100.0%	100.0%
	% of total	57.9%	42.1%	100.0%

Table 7
Chi-Square Test: Environmental Mastery x Gender

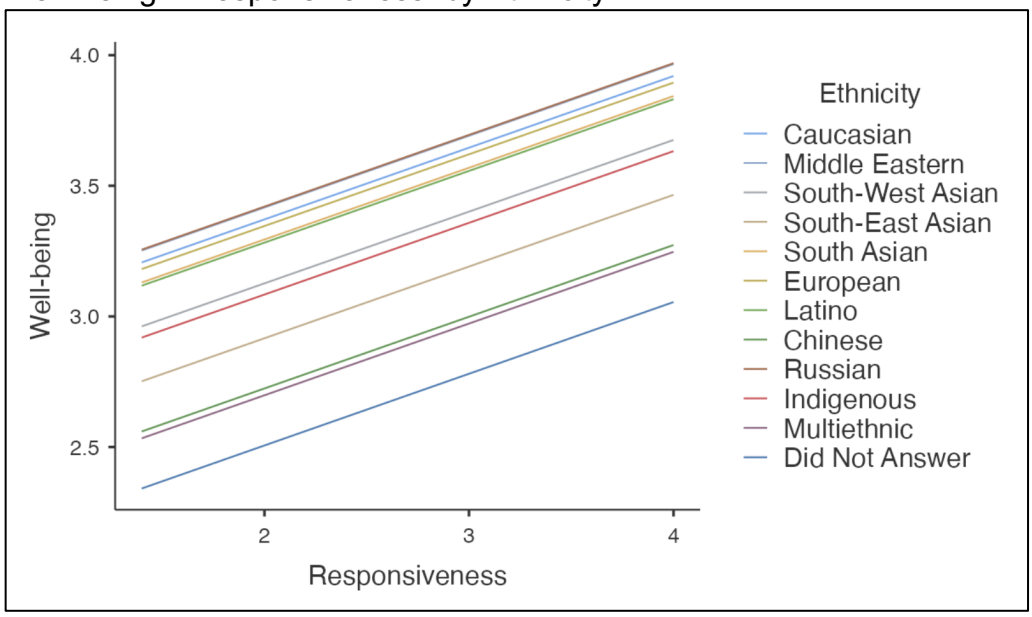
Gender		Environmental-Mastery		Total
		high environmental mastery	low environmental mastery	
Female	Observed	22	16	38
	% within row	57.9%	42.1%	100.0%
	% within column	59.5%	80.0%	66.7%
	% of total	38.6%	28.1%	66.7%
Male	Observed	15	3	18
	% within row	83.3%	16.7%	100.0%
	% within column	40.5%	15.0%	31.6%
	% of total	26.3%	5.3%	31.6%
Non-Binary	Observed	0	1	1
	% within row	0.0%	100.0%	100.0%
	% within column	0.0%	5.0%	1.8%
	% of total	0.0%	1.8%	1.8%
Total	Observed	37	20	57
	% within row	64.9%	35.1%	100.0%
	% within column	100.0%	100.0%	100.0%
	% of total	64.9%	35.1%	100.0%

Figure 4 represents ethnicity differences for ratings of caregiver demandingness and overall well-being. Chinese participants were significantly more likely to have lower ratings of overall well-being after rating their caregiver(s) as more demanding (β = -1.87, p = 0.011).

Table 8
Chi-Square Test: Personal Growth x Gender

Gender		Personal-Growth		Total
		high personal growth	low personal growth	
Female	Observed	33	5	38
	% within row	86.8%	13.2%	100.0%
	% within column	66.0%	71.4%	66.7%
	% of total	57.9%	8.8%	66.7%
Male	Observed	16	2	18
	% within row	88.9%	11.1%	100.0%
	% within column	32.0%	28.6%	31.6%
	% of total	28.1%	3.5%	31.6%
Non-Binary	Observed	1	0	1
	% within row	100.0%	0.0%	100.0%
	% within column	2.0%	0.0%	1.8%
	% of total	1.8%	0.0%	1.8%
Total	Observed	50	7	57
	% within row	87.7%	12.3%	100.0%
	% within column	100.0%	100.0%	100.0%
	% of total	87.7%	12.3%	100.0%

Figure 3
Well-Being x Responsiveness: by Ethnicity



Faculty Differences

Differences in ratings of caregiver responsiveness and demandingness, along with overall well-being based on the participants' faculty were investigated using an independent sample T-Test. Since most respondents were in the faculty of Social Science, we coded the variable to be dichotomous, in which one group are respondents from the Social Science faculty and the other group are respondents from every other faculty. Tables 6 and 7 revealed that participants within the Social Science Faculty were

Figure 4
Well-Being x Demandingness: by Ethnicity

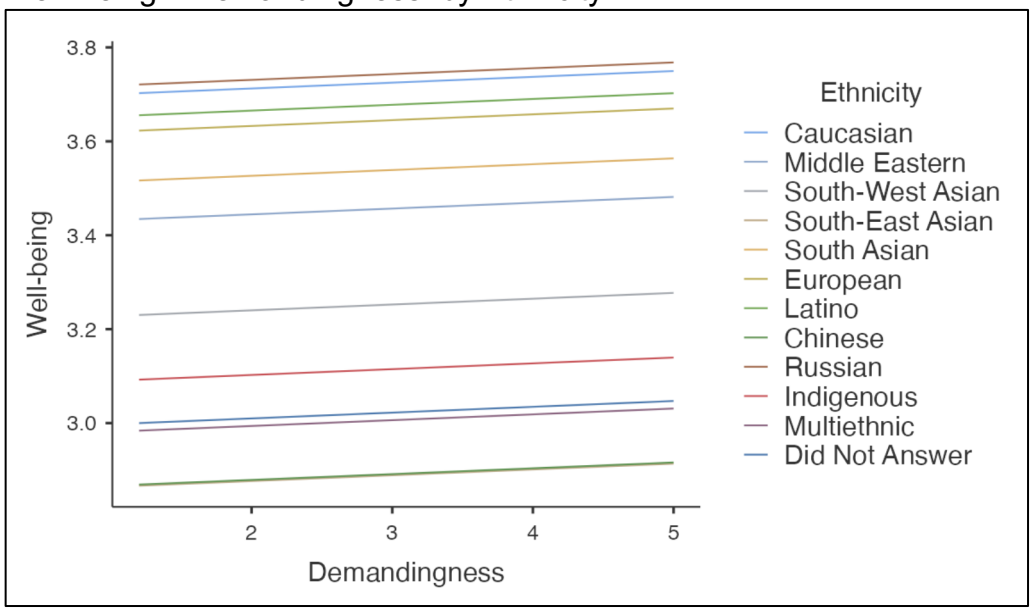


Table 9
Independent Samples T-Test

		Statistic	df	*p*
Well-being	Student's t	0.670	55.0	0.506
Responsiveness	Student's t	-0.431	55.0	0.668
Demandingness	Student's t	0.685	55.0	0.496

equal in overall well-being (*M* = 3.6, *SD* = 0.42) to those in other faculties (*M* = 3.6, *SD* = 0.47), although these results were insignificant: *t*(55) = 0.67, *p* = 0.506. Similar results were found for ratings of caregiver responsiveness, as those within the Faculty of Social Science were equal in their ratings of caregiver responsiveness (*M* = 3.1, *SD* = 0.64) compared to those not in it (*M* = 3.1, *SD* = 0.51). However, these results were also insignificant: *t*(55) = -0.43, *p* = 0.668. Finally, ratings of caregiver demandingness were only slightly higher for participants in the Faculty of Social Science (*M* = 2.1, *SD* = 0.75) compared to those not (*M* = 2.0, *SD* = 0.72). These differences are insignificant as well: *t*(55) = 0.68, *p* = 0.496.

Age Differences

Chi-Square tests were utilized to observe age differences in ratings of autonomy, environmental mastery, and personal growth. Both autonomy ($X^2[1] = 9.00$, *p* = 0.173) and environmental mastery ($X^2[1] = 5.51$, *p* = 0.480) had insignificant results, however, personal growth revealed significant data. Table 6 outlines high versus low personal

Table 10
Group Descriptives

	Group	N	Mean	Median	SD	SE
Well-being	Social Science	23	3.6	3.78	0.418	0.0873
	Other faculties	34	3.6	3.53	0.467	0.0800
Responsiveness	Social Science	23	3.1	3.30	0.635	0.1324
	Other faculties	34	3.1	3.30	0.511	0.0877
Demandingness	Social Science	23	2.1	1.90	0.745	0.1553
	Other faculties	34	2.0	1.80	0.715	0.1226

growth differences in terms of age, indicating that out of the 3 participants who were 18 years old, 2 (66.7%) had high personal growth and 1 (33.3%) had low personal growth. Out of the 45 respondents who were 21 years old, 41 (91.1%) had high personal growth and 4 (8.9%) had low personal growth. Only 1 (100%) participant was 19 years-old and they had low personal growth, as well as the 1 (100%) participant who was 20 years-old. Both participants (100%) who were 22 years old had high personal growth, all participants (100%) who were 23 years old had high personal growth, and 1 (100%) participant who was 25+ years old had high personal growth. These age differences were statistically significant: $X^2(1) = 17.0$, $p = 0.009$.

Qualitative Results

An inductive codebook approach was used to code 54 responses to the question "Please describe how you feel your caregivers' parenting styles impact you." Three main themes were generated from the responses: 1) strict parenting impacts, 2) supportive parenting impacts, and 3) absent parenting impacts. The themes and sub-themes are reported in Table 12.

Strict Parenting Impacts

Anxiety

The majority of participants who reported that either one or both of their caregivers were strict also reported that they developed anxiety about their external environment, as one participant responded:

> "They do impact us because if we are raised with too much over protecting it makes us feel anxious and less confident and vice versa for non-over protecting parents. I have one parent with an overprotective style and another that does not. Both equally care for me, but the parent that is more overprotective did cause me to be more anxious in my life."

Insecurity

Many participants who reported that either one or both of their caregivers were more strict also reported that they had developed insecurities about themselves.

> "My caregivers' approach to parenting was based on "traditional" gender roles that they tried to force onto their kids. Since I didn't personally align with those same beliefs, Caregiver 1 would often berate and mock my beliefs and remove all affection. Their disrespect of me led to the destruction of our relationship and we are no longer on speaking terms. This caused me to develop self-doubt and question their love for me."

Academic Achievement

Several participants who reported that either one or both of their caregivers were more strict also reported that this drove them to high academic achievement and educational success, mostly out of the desire to meet the expectations of their caregiver(s).

> "I think that my caregivers have always been supportive of my goals and activities. They have been actively engaged in my life. This has led me to hold high standards (social, academic, and employment) for myself and others."

Table 11

Chi-Square Test for Personal Growth x Age

Age		Personal-Growth		Total
		high personal growth	low personal growth	
18	Observed	2	1	3
	% within row	66.7%	33.3%	100.0%
	% within column	4.0%	14.3%	5.3%
	% of total	3.5%	1.8%	5.3%
19	Observed	0	1	1
	% within row	0.0%	100.0%	100.0%
	% within column	0.0%	14.3%	1.8%
	% of total	0.0%	1.8%	1.8%
20	Observed	0	1	1
	% within row	0.0%	100.0%	100.0%
	% within column	0.0%	14.3%	1.8%
	% of total	0.0%	1.8%	1.8%
21	Observed	41	4	45
	% within row	91.1%	8.9%	100.0%
	% within column	82.0%	57.1%	78.9%
	% of total	71.9%	7.0%	78.9%
22	Observed	2	0	2
	% within row	100.0%	0.0%	100.0%
	% within column	4.0%	0.0%	3.5%
	% of total	3.5%	0.0%	3.5%
23	Observed	4	0	4
	% within row	100.0%	0.0%	100.0%
	% within column	8.0%	0.0%	7.0%
	% of total	7.0%	0.0%	7.0%
25+	Observed	1	0	1
	% within row	100.0%	0.0%	100.0%
	% within column	2.0%	0.0%	1.8%
	% of total	1.8%	0.0%	1.8%
Total	Observed	50	7	57
	% within row	87.7%	12.3%	100.0%
	% within column	100.0%	100.0%	100.0%
	% of total	87.7%	12.3%	100.0%

Table 12
Main Themes & Sub-Themes

Themes	Sub-Themes
Strict Parenting Impacts	Anxiety Insecurity Academic Achievement
Supportive Parenting Impacts	Independence Confidence Motivation
Absent Parenting Impacts	Emotional Avoidance Independence

Supportive Parenting Impacts

Independence

Majority of participants who reported that either one or both of their caregivers were more supportive also reported that they had a strong sense of independence. As an example, one participant responded:

> "My mother's parenting styles made me who I am; she is caring, trustworthy, respectful, and always listens to what I have to say. She gave me freedom because of the trust we built with each other. I have a strong bond with my mother still and we chat on the phone constantly. I am very independent because of my mother's parenting styles."

Confidence

This was another prominent result of participants' caregiver(s) being reported as more supportive, as participants reported that they felt more confident in themselves. For instance, one individual said:

> "My parents parenting style has ensured my self confidence and I feel I know what a good relationship and parenting style is. I can be very independent but can also rely on others."

Motivation

A third common sub-theme among respondents who reported their caregiver(s) as being more supportive involved them feeling motivated to work hard and achieve their goals.

> "My mom has been very warm and loving. That has strengthened my ability to form close relationships with others. My dad's parenting has changed over time. He has higher expectations for me but is very supportive, which motivates me to try hard."

Absent Parenting Impacts

Emotional Avoidance

The majority of participants who reported either one or both of their caregivers as being more absent also reported that they struggled to express their emotions and feelings, as one participant responded:

> "One parent is overly emotional and the other is absent of emotions. I have a very difficult time expressing how I truly feel and tend to break down when I have to."

Independence

Many of the participants who reported either one or both of their caregivers as being more absent also reported feeling as though they had a stronger sense of independence primarily due to the lack of authority/presence from their caregiver(s). As an example, one participant responded:

> "I am extremely independent because I never felt I could lean on my parents and since I was expected to be able to do things for myself."

Discussion

Analysis of Results

Autonomy

There was a significant positive correlation of 0.333 (p = 0.011*)* between caregiver responsiveness and autonomy. This finding is consistent with the existing literature that associates parents who continue to respond to their child's needs past adolescence with feelings of autonomy (Adams & Berzonsky, 2006; Yerdaw & Rao, 2018). As defined by Carol Ryff (1989), autonomy refers to how independent an individual is and their level of self-determination. This domain significantly correlates with the well-being of emerging adults, as evidenced by our findings. Since our study was conducted on individuals between 18-25 years old, and the majority of participants were 21, our participants were at an age of expected independence. With the transition to university being a major life event, our findings underscore the importance of parental responsiveness in fostering autonomy within this new environment.

In contrast, the qualitative findings depicted that those who reported having strict, overbearing parents commonly reported higher levels of anxiety and insecurity. However, it is important to note that those with uninvolved or absent parents also expressed increased feelings of independence, likely stemming from the need for self-reliance in their circumstances. Those with high levels of autonomy do not rely on external validation but on how they view themselves, providing them with a sense of independence (Ryff, 1989). Therefore, while absent parenting may lead to a sense of independence in emerging adulthood, our findings suggest that responsive parenting encourages complete autonomy.

Overall, achieving autonomy during the university years is crucial, and the positive correlation identified with responsive parenting highlights the importance of caregivers continuing to support their child's needs into emerging adulthood. This sustained support not only fosters confidence but also cultivates autonomy, thereby enhancing the child's overall well-being.

Environmental Mastery

Our study demonstrated a significant positive correlation of 0.464 (p < 0.001) between parental responsiveness and environmental mastery. Individuals who reported that one

or both caregivers were highly responsive also reported higher levels of environmental mastery. According to Carol Ryff (1989), these individuals can create and choose environments that complement their mental state, allowing personal advancement. Environmental mastery requires that an individual receives the support and discretion to take advantage of their environment and make creative changes that best suit their mental state (Ryff, 1989). Our study complements pre-existing literature, demonstrating that parental practices fostering consistent communication, warmth, and support positively influence children's long-term psychological well-being (Mendez & Sanvictores, 2022; Yerdaw & Rao, 2018).

We believe that it is through parental responsiveness that caregivers provide the support necessary for their children to thrive within this dimension of well-being. The qualitative data from our study reaffirms this argument; individuals who reported having a caregiver high in responsiveness also reported having a stronger sense of independence, confidence, and motivation. On the contrary, individuals who reported having parents with more of a strict parenting style reported feelings of anxiety and insecurity. These participants noted experiencing anxiety and insecurity surrounding the development of themselves and their external environment. In this regard, we can clearly see how supportive parents foster the ability and belief for one to take control of their environment and how strict parenting styles, contrary to this approach, inhibit individuals from being able to do so.

Analyzing pre-existing literature and the results of our study, we reiterate the significance of parental responsiveness as a determinant of psychological well-being. More specifically, as it correlates to environmental mastery, parental responsiveness plays a significant role in providing individuals with the support, confidence, and tools necessary to modify and take advantage of opportunities in their environment as emerging adults.

Personal Growth

When analyzing parental responsiveness and well-being, our study found a significant positive correlation of 0.303 (p = 0.022) between parental responsiveness and personal growth. The overall findings present that participants who reported having one or both caregivers high in responsiveness also indicated experiencing greater levels of personal growth, which encompasses the continual positive development of one's personal prospect and ability to adapt in a manner that demonstrates greater effectiveness and self-realization (Ryff, 1989, 1995). Through parental responsiveness, individuals are encouraged to expand their individuality and self-awareness, both essential for personal growth. Moreover, numerous factors are important in this well-being domain, including anxiety, motivation, self-regulation, academic success, and more.

The qualitative data from our study revealed that individuals who were raised by strict parents reported feelings of anxiety and insecurity. These participants reported an increased sense of anxiety and insecurity towards themselves and their environment. The implications of this parenting style diminished any feelings of ability, effectiveness, and self-knowledge that would allow an individual to grow and prosper. In contrast, participants who were raised by supportive parents reported increased feelings of independence, confidence, and motivation. The support these individuals received from their caregiver(s) transcended into the development of fostering traits that positively

impacted personal growth. Our findings are consistent with previous literature, stating that authoritative parenting, high in parental responsiveness, is associated with positive outcomes on students' ability to thrive in their new college environment and significantly negatively associated with students' anxiety levels (Barton & Kirtley, 2012; Silva et al., 2007).

Furthermore, there were notable age differences in the domain of personal growth. Our findings indicate that as the participants' age increased, so did their personal growth. The data outlined that 66.7% of the 18-year-old participants had high personal growth, and 100% of the 19 and 20-year-old participants had low personal growth. As the participants' ages increased, 91.1% of the 21-year-olds had high personal growth, and 100% of the 22, 23 and 25+ participants reported high personal growth. Therefore, our results indicate that personal development increased with the participants' age.

Upon thoroughly examining our study's findings, we conclude that parental responsiveness is the key to achieving great levels of personal growth. Caring for a child's needs, encouraging individuality, and promoting self-awareness brought forth by parental responsiveness is key in shaping individuals' growth through fostering independence and cultivating a strong sense of identity.

Ethnic Differences

Interestingly, our results revealed that Chinese participants were significantly more likely to have lower overall well-being after rating their caregiver(s) as more demanding. This could be attributable to numerous reasons. First, there are differences in collectivistic and individualistic cultures surrounding parenting styles, and some collectivistic cultures may have norms towards using more authoritarian parenting styles (Peterson et al., 2005). Despite these norms, several comparison studies have indicated that Chinese adolescents had lower ratings on specific aspects of psychological well-being when they had more authoritarian caregivers than adolescents from Western cultures (Bi et al., 2018; Mousavi et al., 2016). Peterson et al., (2005) noted that in traditional Chinese culture, it is common for families to avoid confrontation in order to maintain harmony, which might explain why several studies are revealing that, when compared to Western adolescents, Chinese adolescents report lower levels of various psychological well-being dimensions (Bi et al., 2018; Mousavi et al., 2016). Perhaps Chinese adolescents feel as though they are unable to express their emotions to their caregivers, and this causes them to experience psychological strain. In relation to our study, the Chinese participants were more likely to have lower ratings of overall well-being when they rated their caregiver(s) as more demanding, which aligns with previous research analyzing this relationship.

Insignificant findings

While our study uncovered several significant findings, numerous aspects of our research revealed no significant correlations. Notably, we did not find a significant correlation between parental responsiveness and increased positive relations with others, purpose in life, or self-acceptance. These outcomes were unexpected, particularly in light of previous literature suggesting notable correlations in these domains (Lathren et al., 2021; Silva et al., 2007; Zeinali et al., 2011). Additionally, our research did not find a significant relationship between overall well-being and parental demandingness. Previous

research has consistently linked high levels of parental demandingness, often associated with an authoritarian parenting style, with adverse effects such as reduced personal growth (Barton & Kirtley, 2012), purpose in life (Ortega et al., 2021), self-acceptance (Roth et al., 2019), environmental mastery, (Segrin et al., 2022), positive relationships with others (Zeinali et al., 2011), and autonomy (Adams & Berzonky, 2006; Yerdaw & Rao, 2018). However, we attribute these insignificant findings to our small sample size (*N*=57), as research with larger and more diverse samples yields significant correlations in these areas. Despite the lack of significant correlations in certain areas, our study underscores the importance of continued research into the relationship between parenting practices and psychological well-being, which has far-reaching implications for future research and parenting policies.

Broader Significance

Future Research

Our analysis of pre-existing literature revealed a massive gap in research surrounding the implications of parenting styles on the well-being of emerging adults. As discussed previously, most of the existing literature exploring the impacts of parenting styles on well-being is primarily concentrated on children and adolescents. In response, our study focused on the emerging adult population, using McMaster undergraduate students as a sample to conduct a comprehensive analysis and fill in the gaps within the existing literature. The findings of our study revealed that parenting styles have long-term implications on individuals' psychological well-being, even in adulthood. Not only does this research provide greater insight and enlarge the scope surrounding this topic, but it also demonstrates the need to conduct more longitudinal research examining these implications. Based on our findings, future research should seek to examine the duration of these implications throughout the life course of an individual; this will allow for a truly comprehensive understanding of the impact that parents have on their children.

Connection to Policies

Our research findings can be integrated into existing practices, as caregivers must grasp the impact of their parenting style on various facets of their child's well-being. As highlighted, students exhibiting higher levels of overall well-being, particularly in areas including personal growth, autonomy, and environmental mastery, consistently rated their caregivers higher in responsiveness. This observed correlation suggests that parents who foster a responsive environment for their children contribute positively to their overall well-being, which has long-term impacts. These insights are extremely valuable for awareness and education, emphasizing that parents should understand that being responsive can help their child achieve higher levels of overall well-being.

However, we acknowledge that not all individuals have the means to access scholarly articles to obtain this vital information. Thus, it is imperative to translate this knowledge into accessible resources to bridge the gap between research findings and policy implementation. One approach to incorporate these insights into policy is by integrating parenting classes. By offering such classes at local community centres, parents could receive reasonably priced guidance on effectively creating a responsive environment for their children, eliminating the need to seek out research independently. This approach ensures that parents can receive guidance on maintaining balance in the household to

avoid excess coddling while fostering a supportive atmosphere. In addition, since this option may not be feasible for everyone, another avenue for parents to access this crucial information is through professional support such as pediatricians or therapists. Integrating research such as our own into the training curriculum for professionals who engage with families can help parents receive advice in a more accessible manner, aiding in the cultivation of a healthy parent-child relationship. Furthermore, interventions within educational institutions offer another avenue for implementing these research findings. By providing free opportunities to participate in workshops or information sessions grounded in research, schools can play a pivotal role in educating parents about creating a responsive home environment. These initiatives aim to elucidate the long-term effects of parent styles on a child's overall well-being, empowering parents with the knowledge and skills essential for fostering healthy development.

Conclusion

Summary of Findings

Our study explored the impact of parenting styles on Carol Ryff's (1989) dimensions of well-being, illuminating how early childhood experiences shape psychological and emotional health among young adults. Quantitative analysis of the data found that parenting styles significantly impact overall well-being. Specifically, caregiver responsiveness emerged as a factor associated with higher levels of autonomy, environmental mastery, and personal growth. In contrast, parental demandingness did not correlate significantly with overall well-being or any of Ryff's (1989) well-being domains. Complimenting these quantitative findings, our qualitative analysis provided deeper insights into the dynamics of parenting styles, with three primary themes: strict parenting, supportive parenting, and absent parenting. Participants who were raised with strict caregivers experienced heightened levels of anxiety, insecurity, and academic achievement, whereas those with supportive caregivers had increased independence, confidence, and intrinsic motivation. Lastly, the absence of caregiver involvement, as seen in neglectful parenting, resulted in participants' reporting increased emotional avoidance and a premature sense of independence.

Limitations

One limitation that could have potentially impacted the objectivity and integrity of our thesis project is that all members of our research team are students at McMaster University. Our study sample comprised undergraduate students at McMaster University, the same demographic as all of our group members. It is important to note that Madeline Facey, Kyla Guerriero, and Mia Dimovski had previously been employed by McMaster University as teaching assistants. These affiliations introduce the possibility of bias within our study for two main reasons. First, students might have experienced a sense of obligation to participate in our study, arising from prior interactions with Madeline F., Kyla, or Mia as teaching assistants, or alternatively, due to our shared membership at McMaster University.

Another limitation of our study is that minimal research has been published that analyzes how parenting styles affect adult populations. While attachment theory and parenting styles have been extensively researched, current literature explores these concepts in the context of child and adolescent development, relationships, and well-

being. The implications of childhood attachment and parenting styles on young adults, specifically in the context of well-being, have received significantly less attention. This is a significant limitation as lacking research might have hindered our ability to draw connections between our study results on McMaster students and the broader population. Therefore, while our study has attempted to bridge this gap in current research, the scarcity of available studies on adult populations is a notable limitation of our topic.

The final limitation of this study pertains to data collection and analysis. Despite our initial goal of recruiting 80 participants, we encountered some challenges during the recruitment phase, resulting in a total of 57 participants. While this sample size provided valuable insights into the attitudes and behaviours of McMaster students, it falls short of our intended target. Consequently, our results may be less generalizable to the broader McMaster undergraduate community and the young adult population as a whole. Nevertheless, the insights gained from this study still offer valuable contributions to the existing literature in this research domain.

Significant Insights

Our study has uncovered three significant positive correlations between parental responsiveness and key dimensions of Ryff's (1989) well-being domains: autonomy, environmental mastery, and personal growth. These insights underscore the crucial role of parental responsiveness in shaping emerging adults' psychological well-being, aligning with the principles of self-determination theory. Interestingly, our qualitative analysis further supported these domains, illustrating how supportive parenting fosters independence, confidence, and motivation. In light of these findings, our study offers a deeper understanding of how parenting practices profoundly influence the development of young adults. These insights are useful for the academic community and have practical implications for fostering positive developmental outcomes across adults.

Concluding Thoughts and Statements

In conclusion, our study provides valuable insights into the impact of parenting styles on the psychological well-being of emerging adults, specifically McMaster undergraduate students. Through a mixed-methods approach, we found that parental responsiveness significantly correlates with higher levels of overall well-being, autonomy, environmental mastery, and personal growth, emphasizing the enduring influence of early caregiving experiences. By bridging the gap in the literature, our study contributes to a deeper understanding of the factors shaping individuals' psychological well-being, with implications for future research, parenting practices, and policies.

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Families Behind the Filter: How Social Media Influences Undergraduate Students Perceptions of Parenthood

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Abstract

Social media is an influential and informational tool that has gained immense prevalence, particularly among young adults. On many social media platforms, parenthood has become a popular topic and highlights the lived experience of parents. This study explores how social media impacts undergraduate students' perceptions and attitudes towards parenthood. We seek to uncover the dominant messaging and themes surrounding parenthood on social media and explore the extent to which undergraduate students conform to online opinions. Previous research has yet to examine the relationship between social media and attitudes towards parenthood. In addition, few studies have looked at how undergraduate students conceptualize parenthood in this digital age. We conducted an online anonymous survey via the LimeSurvey platform using both open-ended and closed-ended questions. This research is qualitative in nature as it concerns undergraduate students' experiences on social media and their personal opinions. This study has been reviewed and approved by the McMaster Research Ethics Board. Our findings reveal that social media influences undergraduate students' stance towards having kids, as well as feelings of fear and/or anxiety towards birth, pregnancy, and having children. Furthermore, social media sustains this influence on undergraduate students' perceptions of parenthood regardless of skepticism towards social media, interest in parenthood, or other demographic factors. This research serves as a foundation for understanding the dominant ideologies surrounding parenthood on social media, and how they may permeate personal attitudes and lifestyle choices.

Introduction

In an era that is engulfed by social media and the influence it has on people's attitudes, beliefs, and ideas, it is no wonder that it is a widely researched topic in academia. Social media has a profound significance on how individuals not only view their current and past experiences (Abi-Jaoude et al., 2020), but it may also impact how they view their future. Among the myriad of power and influences that social media has, the manner in which it can mold the perception of parenthood is not something that has been extensively researched. Due to social media, individual attitudes are subject to change (Can & Alatas, 2019), and undergraduate students are constantly exposed to a variety of different content. This content has the potential to greatly influence the way

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undergraduate students perceive the complex journey of parenthood. Social media serves as a conduit for various perspectives and viewpoints, some of which might challenge pre-existing beliefs under the way of social media's inescapable influence. Thus, this research paper will seek to understand how social media can influence undergraduate students' perceptions of parenthood.

Each segment of this thesis paper will be clearly defined. First, a review of social psychological theories will be explored to aid in the understanding of this phenomena. Next, we will delve into the theoretical frameworks of social comparison theory and social learning theory, using them as guides to comprehend the mechanisms by which social media impacts individuals. Subsequently, a comprehensive literature review will explore existing research on the topic, identifying potential gaps and deficiencies. Following this, the methodology section will elucidate our research and analysis procedures. Next, the results will be presented, highlighting undergraduate students' current perspectives on parenthood, leading to a discussion of our findings. Finally, our conclusion will address limitations and significant insights collected from the study.

Theory

Social Comparison Theory

Social media in this generation has a significant impact on how individuals weigh their own ideas and beliefs (Kross et al., 2020). The constant stream of information that envelops people's lives seems omnipresent and persistent. With the frequency of social media usage, it is valuable to explore how much online content truly influences personal opinions and worldviews, and the extent to which people compare their mental constructs to those of others. The harsh exposure to these incessant and diverse voices on social media shows the significance of the potential negative effects on an individual's belief structures and systems. Thus, this establishes the use for employing social comparison theory.

Developed in 1954, social comparison theory was first introduced by Leon Festinger, an American social psychologist who is considered to be the leading theoretician (Festinger, 1954). The framework of this theory posits that individuals assess their personal opinions and beliefs compared to others' personal opinions and beliefs (Festinger, 1954). This is because people often look for external sources of information so they can advise for or against their own ideas (Festinger, 1954). If individuals stop comparing themselves to others, it can result in tension or conflict. They may become less open-minded towards different ideas, leading to hostility and criticism of other perspectives (Festinger, 1954). In regard to the perception that young people have toward parenthood, social media can impact what information we decide to integrate into our own ideas. Because social media is the main source of information, it is no wonder that the perception of parenthood is something that may be negatively affected. Similarly, undergraduate students' ideas of what parenthood means to them can stem from what others believe on these social media platforms. It can hone unrealistic expectations of what parenthood should be, or it may lead to feelings of self-doubt and apprehension as they compare their own lives and beliefs to others.

In Festinger's original research on social comparison theory, he had a number of hypotheses to explain why social comparison exists and how it influences an individual's thoughts and ideas. He hypothesized that there is an innate drive in humans

to appraise one's opinions and competencies and evaluate them through comparison with the capabilities and opinions of others (Festinger, 1954). For example, those who receive judgement in regard to an idea or opinion are more likely to change their opinion if others contend it. One tenet of this theory is that an individual is less likely to compare their opinions to those they perceive as too distant from themselves (Festinger, 1954). This is because it is impossible to accurately compare abilities when one is too low or high above them (Festinger, 1954). An individual who accepts a specific group as a standard of comparison may feel pressure to adjust their opinions to conform to that group's ideas (Festinger, 1954). Lastly, social comparisons can occur at one time, or across time, such as comparing oneself to an imagined ideal future self.

This principle is key for our research, as parenthood is a future experience that much of our sample is not yet a part of. All in all, social comparison theory can explain how comparing oneself to others on social media may impact personal ideas and opinions.

Social Learning Theory

Social learning theory hypothesizes that individuals learn by observing others (Bandura, 1977), which is a concept that is repeatedly represented in social media (Deaton, 2015). Social media platforms are significant vessels of information, and what we see on social media can often influence behaviour. Online behaviours, such as liking or disliking a post, act as reinforcements or punishments for those online behaviour (Deaton, 2015). Social media content continually contests and reconstructs today's social norms (Deaton, 2015). Casual and unsupported claims can easily result in misinformation, which is generally hard for people to recognize. In relation to parenthood, undergraduate students may frame their behaviours and beliefs by observing relevant content online. The framework of this theory postulates that social behaviour is learned by examining and copying a specific behaviour that another person has performed (Bandura, 1977). There are key components that the observing individual must follow, such as the ability to focus on the behaviour of the person modelling, the ability to understand what they observed and how to copy it, and the inclination to actually do the behaviour, which is guided by either a reward or punishment (Bandura, 1977). Individuals are constantly taking social cues and information from others, which in turn heavily forges their own beliefs and attitudes. Thus, the behaviours of others that undergraduate students see on social media can shape the way they view that information, and accordingly, how they copy it.

Based on the early work of American psychologist B.F. Skinner, Canadian-American psychologist Albert Bandura developed social learning in 1977 (Bandura, 1977). Bandura created his theory based on Skinner's concept of behaviourism, which posits that one's environment can influence behaviour (Grusec, 1994). Bandura's (1977) theory highlights the influence that social interactions have on one's learning and behaviour, hypothesizing that individuals will learn a new behaviour or gain new knowledge by observing another who performs that specific behaviour. The observer does not have to be aware that they are learning, rather these consequences can happen both intentionally and unintentionally (Bandura, 1977). Bandura (1977) acknowledges that many other factors, such as culture, have significant importance on how behaviour is molded. For example, personal values and social relationships can affect what one accepts regarding what they copy and what they evade.

Another key tenet of this theory is the reinforcement and punishment that follows a learned behaviour. This idea is heavily influenced by Skinner's work on operant conditioning, a component of behaviourism (Grusec, 1994). It holds that if there is a positive outcome that follows a behaviour, the more likely that behaviour will be repeated, and if instead there is a negative consequence, it may prevent that behaviour from being repeated (Bandura, 1977).

The principles of this theory are crucial for our research on how social media negatively influences undergraduates' perceptions on parenthood because it can help explain why what we see on social media is repeated. It is imperative to learn how what we see online can create behaviours and ideas that may stem from misleading information.

This section explores how social comparison theory and social learning theory explain the influence of social media on perceptions of parenthood among undergraduate students. These theories emphasize the role of comparison and observation in shaping beliefs and behaviours, shedding light on the impact of online content on personal attitudes.

Literature Review

Introduction

The rising popularity of social media creates a cause for concern in terms of how social media content is adopted by consumers. More specifically, the connection between social media and parenthood has been increasingly significant due to the prevalence of parenthood content displayed on social media apps. Thus, an evaluation of how social media influences viewers is essential to understand how perceptions of parenthood are being influenced by social media content. For the purpose of this research, we have identified four important themes throughout existing literature that will be thoroughly discussed in order to investigate the relationship between social media and parenting. The themes include, but are not limited to, social media and its general influence over behaviour and perception, depictions of motherhood, depictions of pregnancy and birth, as well as fatherhood. Each will be evaluated in terms of how they may have been influenced or shaped by social media content. For this study, social media will encompass apps and sites such as TikTok, Instagram, and Twitter; however, informing literature will explore a wider range of media including television shows, movies, and blogs. Therefore, this demonstrates the need for further research on the influence social media can have on perceptions of parenthood.

Social Media and its Influence

While exploring the relationship between social media and parenthood perceptions, the literature provides much support for how social media can influence people's ideologies and behaviours. To illustrate, online portrayals of smoking, drinking, and healthy lifestyles have been proven to influence the thoughts and behaviours of consumers (Dunlop et al., 2016; Yoo et al., 2016). One exemplary consideration is underage drinking and the connection to alcohol content on social media. Dunlop et al., (2016) state that the age group with the highest engagement with alcohol-related content on social media demonstrates the most troublesome alcohol use. Thus, a connection can be made between the content one engages with, and their behaviours

related to such content. Evidently, our actions reflect our beliefs, which supports the idea that social media content influences people's attitudes and conceptualizations. More concretely, a study reviewed by Dunlop et al., (2016) found that nearly all college students in the given study had problematic drinking because of the alcohol-related social media content they engaged with. This clearly demonstrates the influence social media can have on people.

Similarly, social media content related to smoking has also been shown to influence tobacco use, as well as perceptions of tobacco use by oneself and peers (Dunlop et al., 2016; Yoo et al., 2016). Research shows that online exposure to positive depictions of smoking leads to more positive perceptions of smoking and a higher likelihood of smoking behaviours; however, exposure to negative depictions of smoking does not yield the same results (Dunlop et al., 2016; Yoo et al., 2016). In contrast, antismoking content influenced some to rebel and increase smoking behaviours (Yoo et al., 2016). Overall, positive depictions of smoking were significantly more influential than antismoking content, specifically in terms of having consumers' behaviours align with the presented messages (Dunlop et al., 2016; Yoo et al., 2016). More importantly, the existing research supports how negative content has a significantly higher impact on consumers compared to positive content; thus, revealing the problem with certain types of social media content. This provides support for the current study in which we state that the inherent issue for this realm of research is how social media can negatively influence perceptions and behaviours towards the content one consumes.

Considering portrayals of parenthood in social media is essential to understand the mechanism behind how such social media content shapes viewers' perceptions of parenthood. On a more positive note, the current literature highlights how social media can be a beneficial outlet for many mothers. For example, certain apps allow mothers to share their pregnancy and parenting stories with other mothers, which promotes community and provides reassurance and relatability (Johnson, 2014; Kirkpatrick & Lee, 2022; Wegener et al., 2022). Furthermore, sharing experiences through social media can allow mothers to bring light to taboo or previously concealed topics (Wegener et al., 2022). This could have positive effects on mothers because they may feel less alone if others are experiencing similar situations. This promotes realistic experiences of motherhood, which increases mothers' competence. In addition, depictions of motherhood on social media can influence mothers perceived self-efficacy (Ouvrein, 2022). This reinforces the idea that social media can directly impact us and shows that this phenomenon translates to the topic of parenthood.

In contrast to the benefits social media can provide to mothers, it is more common to see how social media displays idealized examples of parenthood that elicit comparison and competition. For example, social media can add a quantitative aspect to mothering through comparing likes, comments, and followers, which leads to competition between mothers, objectification of motherhood, and feelings of anxiety or jealousy (Johnson, 2014; Kirkpatrick & Lee, 2022). Furthermore, parent-related content produced on social media is shown to influence perceptions of what mothering, pregnancy, and breastfeeding should look like; thus, comparisons to such content can influence mothers' actions, views of oneself, and expectations of parenting roles (Johnson, 2014; Kirkpatrick & Lee, 2022). This impact demonstrates that social media has become an

agent of socialization in today's society. Therefore, parent-related content can influence both societal and personal views of parenthood.

Depictions of Motherhood on Social Media

The possible influence social media holds over the perceived self-efficacy of mothers is of rising interest for many scholars. While various portrayals of motherhood are available on social media, Germic (2021) and Ouvrein (2022) identified two overarching categories: 1) the "realistic" displays of motherhood, and 2) the "unrealistic" displays of motherhood. Both experienced and first-time mothers have been found to interpret these representations differently in terms of how they influence one's perceived self-efficacy (Ouvrein, 2022). For example, Ouvrein (2022) found that first-time mothers who claimed to have had regular interaction with "unrealistic" portrayals, such as those of the "alpha mom" who appear to excel in their role as a mother with ease, scored higher on the self-efficacy scale. For experienced mothers, interaction with this category of content elicited an inverse response (Ouvrein, 2022). Although confounding variables, such as socioeconomic status and cultural backgrounds could possibly account for this discrepancy, Ouvrein's (2022) research nevertheless provides significant insight on the influence social media can have over a mothers' self-perception.

Germic (2021), while sharing some of the same observations as Ouvrein (2022), examines which platforms were home to realistic and unrealistic portrayals of motherhood. This investigation yielded interesting conclusions that are consistent with our later discussions on fatherhood. According to Germic (2021), "*mommy blogger*" websites reflected a more "realistic" side of parenting, one that did not hesitate to discuss internal and external anguish, bewilderment, and struggles that come with being a mother. Sharing normally hidden parenting experiences online seemed to foster a greater sense of relatability between producers and consumers, and thus are regarded as more "realistic" (Germic, 2021; Orton-Johnson, 2017). On the other hand, platforms such as Instagram and Facebook generated more "unrealistic" posts (Germic, 2021). Definitions of what constitutes realistic and unrealistic ideals for motherhood carry a myriad of nuances. However, Germic (2021) highlights a commonly overlooked aspect of the relationship between social media platforms and mom content creators. The information mothers wish to share correlates with the platform they use, and the type of content viewers consume is related to the platforms they engage with.

Depictions of Pregnancy and Birth on Social Media

By exploring apps designed to offer parents with support before, during, and after pregnancy, Baker & Yang (2018) and Johnson (2014) demonstrate the implicit messages embedded within these apps that influence the behaviours and attitudes of parents. Generally, this influence is seen to have favourable psychological and behavioural impacts on mothers but shapes and upholds problematic gender norms regarding the parental role of fathers (Baker & Yang, 2018; Johnson 2014).

Mothers often look to social media to enhance their social support networks and use apps to gain information throughout their pregnancy journey. Although these apps are not social media apps, they are often user-generated and represent specific ideologies the same way social media does. Apps like Sprout Baby, Baby Connect, andEbluebook

act as reminders, developmental stage trackers, and essential updates that aid in the management of daily tasks and routines for both mother and infant (Johnson, 2014). By providing empowering experiences that help moms feel productive, competent, and in control of their pregnancy, these apps are thought to have a favourable impact on the mental health and well-being of mothers (Johnson, 2014). Social media, particularly Facebook, functions as a platform for information much as pregnancy apps do. For example, Facebook pregnancy and birth forums serve as an informal learning environment that can foster meaningful connections with individuals in similar situations. This study focuses on women who are pregnant or already mothers but reinforces the influence social media has on our perceptions and actions.

Despite apps for expecting fathers being far less readily available, the handful that are available, tend to cast fathers in a very different light compared to mothers. Apps such as, Pregnant Dad and New Dad, have been shown to deliver information in a humorous and lighthearted manner (Johnson, 2014; Thomas et al., 2018). For example, statements such as *"Surprise your wife with tidbits of information about the development of your baby*" or "*Make your wife happy*" not only transformed a previously serious topic delivered to women into a humorous one for men, but also directs the information to the mother (Johnson, 2014; Thomas et al., 2018). The overemphasis on the mother may lead to problematic outcomes as it teaches fathers how to be a better partner rather than a better parent; thus, influencing fathers to perceive their role as being far less serious and important (Johnson, 2014; Thomas et al., 2018).

Depictions of Fatherhood

Societal norms and gender roles have greatly impacted the conceptualization of parenting, as made evident by the differences found in pregnancy apps for mothers and fathers. However, with recent progressive shifts in social policies, the discourses surrounding fatherhood have slowly evolved to become more inclusive (Grau Grau et al., 2022). Despite this recent change, literature examining the relationship between fathers and social media remains severely unaddressed. For now, we draw on studies that look at blog websites as both social media and blog websites are user-generated forms of media.

Scheibling (2020) and Teague & Shatte (2018) discovered that blog-based sites shared the bulk of the honest male experiences in parthood, which reflects Germic's (2021) findings that highlighted where "realistic" parenting portrayals occurred. The material making up these discussions primarily focuses on the difficulties, frustrations, and misunderstandings working fathers have when negotiating their role in the family, a role that most men wish to transcend beyond financial duties (Scheibling, 2020). Content on these websites, which was frequently characterized by humour, had a positive effect on fathers' psychological well-being, helping to establish better supportive networks (Scheibling, 2020). The humorous tone that often provides comic relief for current fathers may feed existing "incompetent" father stereotypes (Teague & Shatte, 2018; Scheibling, 2020). Even though blog depictions of fatherhood were realistic and supportive, there may be gender roles and stereotypes that are indirectly represented, which may appear lacking to some viewers.

Overall, the existing literature on the relationship between parenthood and social media demonstrates a significant connection between social media, personal beliefs,

and parenthood; thus, demonstrating the importance of our research. The themes we found in the literature revealed that media depictions of various topics influence consumers' opinions and ideologies regarding the topic observed. Similarly, social media platforms can shape both mother's and father's perception of oneself as a parent. This illustrates the influence that social media platforms have on people during pregnancy, birth, and postpartum. Lastly, the current literature reveals a gap in research regarding fatherhood on social media as well as gender biases in the conceptualization of parenting. With the inflation of parenting depictions on social media, we must aim to close the gaps in existing research by revealing unobserved phenomena concerning the influence social media has on perceptions of parenthood.

Methodology

Our methodology section will include a discussion regarding the recruitment process, ethical issues, survey procedure, data analysis, challenges, and the risks associated with our research. The research was approved by the McMaster Research Ethics Board (MREB#: 0327).

Recruitment

To begin our research, we first recruited participants for our survey and then collected participant data. Our sample population was undergraduate students over the age of eighteen who currently study at McMaster University. Therefore, our recruitment process was targeted to reach as many students as possible. We used a variety of recruitment strategies including physical posters and virtually reaching out to clubs. Our poster was created using a template found on the MREB website and included details about our study, our contact information, a link to the survey, and a QR code. Before posting the posters around campus, we got approval from the MSU Underground. The posters were then put up around campus in high traffic areas to reach the greatest number of students. After the winter break, we put more posters up around campus as many of them had been taken down or were missing many of the pull tabs.

An additional avenue of recruitment we used was reaching out to clubs at McMaster to post on their social media or send an email directly to their members about our study. We chose to reach out to groups and clubs that certain group members are a part of. To mitigate any ethical problems, our group members did not reach out to the clubs in which they hold membership. The groups we chose to recruit from included the Social Psychology Society, Maction, McMaster Book Club, McMaster Recreational Dance Team, and McMaster University Choirs. Recruitment from these clubs resulted in the social media coordinator for each club receiving an email from one of our group members, using the template provided by Dr. Clancy, which included information about our study, any risks involved in the research, and the estimated length of time it would take to complete the survey. A letter of information regarding our study was also provided and it was instructed to the social coordinator that the letter of information be provided to the club members as well. Given that we received many partial responses to our survey from students and a general lack of responsiveness from students, we requested an MREB amendment form on January 19, 2024, to recruit from additional clubs. These additional clubs included the McMaster Social Science Society, the McMaster Sociology Society, the McMaster Humanities Society, the McMaster PNB

Society, and the McMaster Human Behaviour Society. Furthermore, groups that we contacted in our first round of recruitment who failed to respond were sent a follow up email in early January. Our research relied on the sampling techniques of convenience sampling given that we sampled the undergraduate population at McMaster and relied on respondents to share our survey with their peers.

Survey Procedure

When prospective participants opened our survey, they first encountered a letter of information on the splash page of the survey. After participants read the letter of information, they were prompted with two options: yes, they consent to continue with the survey or no, they do not wish to complete the survey. If a participant selected yes, they were giving their implied consent that they agreed to participate in the study and were willing to let us use the information they provided in the survey. If participants clicked no, they were prompted to the end page of the survey which thanked them for their time and informed them of the poster session on March 20, 2024, where they could learn more about the results of our research.

Our research was conducted via an anonymous online survey and was hosted on the McMaster and MREB approved platform Lime Survey. Survey questionnaires have benefits in that they are low cost and highly adaptable to the environment which the respondent feels most comfortable in. The survey had 30 questions and was estimated to take participants 10-to-15 minutes to complete. The survey was designed so that participants could take the survey in a location of their choosing so long as they had access to the internet and a device capable of completing the survey. Our survey consisted of questions using a Likert scale as well as open-ended questions that participants answered themselves. Our survey sought to uncover how social media influences McMaster undergraduate students' perceptions of parenthood. The questions we asked in our survey attempted to gauge participants' attitudes toward certain social ideals surrounding parenthood. Additionally, there were questions to determine their personal feelings towards pregnancy, birth, and parenthood. We ended our survey by asking demographic questions such as age, gender identity, program of study, and religious affiliations to determine if these factors had any significance. The data that was collected was stored on a password protected computer that was only accessible to the members of our group. We kept our survey open until we reached 100 responses, or until February 16, 2024, whichever occurred earlier. We closed our survey on February 16th, 2024, at 11:59 PM with a total of 39 completed responses and 205 partially completed surveys.

Data Analysis

We began data analysis once our survey closed, on February 16th, 2024, and used Jamovi software for our quantitative data analysis. Qualitative data was analyzed using descriptive and analytical coding. We completed our data analysis on February 26th, 2024, to ensure we had enough time to transfer the information to our poster, which was due March 4th, 2024. Our data will be deleted no later than April 30th, 2024, or when Dr. Clancy informs us that we are able to delete it, whichever occurs first.

To complete our qualitative analysis, we employed both descriptive and inferential statistics to analyze the gathered data. Descriptive statistics facilitated the quantitative examination of the survey data. To accomplish this, we first improved the labeling of

each variable for clarity and streamlined data analysis. Subsequently, we re-coded the variables using a codebook to ensure smooth analysis and computation of the data. To establish measures of central tendency, we recalculated several related variables. Lastly, we transformed the data variables to distinguish between each response in the dataset and ensure the appropriate measure type was applied. Following these adjustments, a comprehensive descriptive analysis was carried out on all data variables to ensure thorough and accurate analysis. Finally, inferential statistics were conducted based on the insights gained from the descriptive analysis.

Inferential statistics were utilized to extrapolate conclusions about the broader sample data, enabling the formulation of predictions. Specifically, t-tests and correlation matrices were employed for this purpose. T-tests facilitated the assessment of the significance of disparities between the means of two groups and their interrelatedness. Meanwhile, correlation matrices enabled the examination of associations between multiple variables, identifying whether they were positive or negative, significant, or non-significant.

Furthermore, we applied thematic analysis to our open-ended survey questions using descriptive and analytical coding. Each response remained anonymous, and upon reviewing all submissions, we identified recurring themes and meticulously categorized them into a comprehensive codebook for optimal organization. The qualitative analysis adhered to these established procedures.

Challenges

A challenge that we anticipated encountering during data collection was the abundance of incomplete survey responses. Individuals may begin to take our survey but choose to exit at any point which would result in their survey response being incomplete. This was problematic as it did not give us a full picture of the participants' attitudes towards parenthood in relation to social media. Additionally, we recognized that our topic may be of more interest to female students resulting in fewer males who completed our survey compared to females. This made it difficult to compare the results between male and female respondents and impeded the generalizability of our findings on male participants. Finally, because only one of our group members was familiar with the Jamovi software, we anticipated running into some challenges during data analysis. To ensure that this group member was not solely responsible for data analysis, additional group members agreed to familiarize themselves with the software in the time between the release of the survey and when data analysis began.

Risks

Research naturally has inherent risks; however, we took all measures to limit and mitigate risks associated with our research. Furthermore, our research did not pose any risk greater than those in everyday life. To limit any ethical issues, we ensured that the group member who was a part of each club was not the one reaching out for recruitment. In terms of psychological risks, there was a possibility that completing our survey made individuals feel embarrassed, uncomfortable, worried, or upset due to the nature of some of the questions being asked. To minimize psychological risks, we made our survey online and anonymous so that participants could complete the survey in a safe location of their choosing, feeling comfortable to answer honestly. Support

resources were listed on the letter of information and end page of our survey so that participants could access help if needed. Finally, participants were not required to complete the survey and could exit at any time prior to submitting the survey without having their responses recorded.

In addition to psychological risks, there were also potential social risks associated with completing our survey. If participants completed our survey in a public setting, someone may have been able to see their responses, which would have resulted in their privacy being lost. Additionally, if someone liked or replied to a post about our survey, their identity could become known which would have social and psychological risks. To mitigate social risks and protect participant anonymity, we asked participants to complete the survey in a safe, private setting and to refrain from engaging with posts on social media or emails pertaining to our survey.

This section recounted the steps and ethical considerations that were taken to uncover how social media influences undergraduate students' perceptions of parenthood. McMaster students were recruited via posters and social media to participate in an online survey. After data collection on the MREB approved platform LimeSurvey, our quantitative data was analyzed using descriptive and inferential statistics on Jamovi, and our qualitative data was analyzed through descriptive and analytical coding. Many steps were taken throughout the recruitment and data analysis process to ensure the confidentiality of our participants.

Timeline for Data Collection and Analysis

Date	**Task**
October 19, 2023	Hand in research proposal and ethics protocol on Avenue to Learn by 11:59 pm
November 1, 2023	Zoom meeting with Dr. Clancy regarding our research proposal and ethics protocol
November 13, 2023	Final revisions must be handed in by this date in order to receive feedback
November 17, 2023	One-to-two page overview of research project due on Avenue to Learn at 11:59 pm
Closing down of data collection/survey - February 16, 2024	Survey is live on LimeSurvey and data analysis may begin
February 16, 2024	Survey closes on LimeSurvey
February 16 – March 4, 2024	Conduct data analysis for poster and final thesis paper
February 16, 2024 – March 28, 2024	Work on final thesis paper
March 4, 2024	First draft of poster due

March 7, 2024	Final draft of poster due
March 20, 2024	Poster Session
March 28, 2024	Final thesis paper is due on Avenue to Learn at 11:59 pm

Results

Sociodemographics

Our study included 39 undergraduate students from McMaster University (n=39), aged 18 years and above. The subsequent findings are contingent upon responses to demographic questions encompassing the program of study, age, gender identity, ethnicity, religious affiliation, sexual orientation, and relationship status.

Program of Study

The initial sociodemographic question in the survey pertained to participants' chosen field of study, marked as an open-ended question encompassing 24 distinct academic disciplines spanning various faculties. The majority of respondents specialized in social psychology (13.2%). This was followed by life sciences (8%), human behaviour (8%), molecular biology (5.3%), computer science (5.3%), psychology (5.3%), BTech (5.3%), engineering (5.3%), and English and cultural studies (5.3%). Additionally, a lesser portion of participants represented sociology (2.6%), nursing (2.6%), biochemistry (2.6%), political science (2.6%), biology (2.6%), civil engineering (2.6%), computer engineering (2.6%), chemistry (2.6%), software engineering (2.6%), chemical biology (2.6%), commerce (2.6%), PNB (2.6%), health and society (2.6%), film (2.6%), and medical radiation sciences (2.6%). Furthermore, a single participant did not provide a response to the question, leaving their field of study unknown.

Age

Figure 1 shows the frequency table of the ages in our sample population. The majority of our sample was 21 years of age. Interestingly, none of the individuals sampled were 22 years old.

Gender Identity

The majority of our participants identified as female (79.5%), with the rest identifying as male (20.5%).

Ethnicity

Our sample group displayed a rich variety of ethnic identities, facilitated by an open-ended question format encouraging diverse responses. Predominantly, participants self-identified as white (66.7%), with Asian (23%), mixed race (5.1%), Slavic (2.6%), and Arab

Figure 1

Frequency table of age

Age	Counts	% of Total	Cumulative %
18	6	15.4%	15.4%
19	9	23.1%	38.5%
20	9	23.1%	61.5%
21	14	35.9%	97.4%
22	0	0%	97.4%
23	1	2.6%	100.0%

(2.6%) individuals also represented.

Religion

Religious affiliation was determined through an open-ended question. The predominant portion of participants indicated no religious affiliation (28.2%), with Catholic (23%), Atheist/agnostic (20.5%), Christian (17.9%), Buddhist (2.6%), Muslim (2.6%), Sikh (2.6%), and prefer not to answer (2.6%) also found.

Sexual Orientation

This open-ended sociodemographic question revealed that the majority identified as heterosexual (66.7%), followed by bisexual (12.7%), homosexual (10.3%), and individuals who preferred not to answer (10.3%).

Relationship Status

The last demographic question asked in the survey pertained to relationship status. This close-ended question revealed the majority of participants were single (61.5%), followed by in a relationship (35.9%), with one respondent preferring not to answer (2.6%).

Social Media Use

Question 1 aimed to identify the social media platforms used by our participants. They were asked to select all listed platforms that they engaged with. Instagram was utilized by all participants (100%), with YouTube (84.6%), Snapchat (76.9%), TikTok (66.7%), Pinterest (53.8%), Facebook (33.3%), and X (30.8%) following in usage frequency.

Time Spent on Social Media

Figure 2 shows the frequency table of the amount of time spent on social media in our sample population. The majority of our sample spent 3-4 hours on social media, with the least amount of respondents spending 4-5 hours.

Quantitative Results

The following graphs depict responses to close-ended questions aimed at understanding the impact of social media on attitudes towards parenthood. There are

Figure 2

Amount of hours spent on social media

Hours on Social Media	Counts	% of Total	Cumulative %
1-2 Hours	4	10.3%	10.3%
2-3 Hours	8	20.5%	30.8%
3-4 hours	18	46.2%	76.9%
4-5 Hours	2	5.1%	82.1%
5+ Hours	7	17.9%	100.0%

Likert-style questions spanning from "Strongly agree" to "Strongly disagree," as well as Likert-style questions spanning from “Very often” to “Never.”

Figure 3 illustrates whether participants actively seek out parenthood-related content on social media. The data indicate that the majority of our sample disagrees with this statement, suggesting that this age cohort may not have a particular interest in this topic.

Figure 3

Actively seeking parenthood-related content because of interest

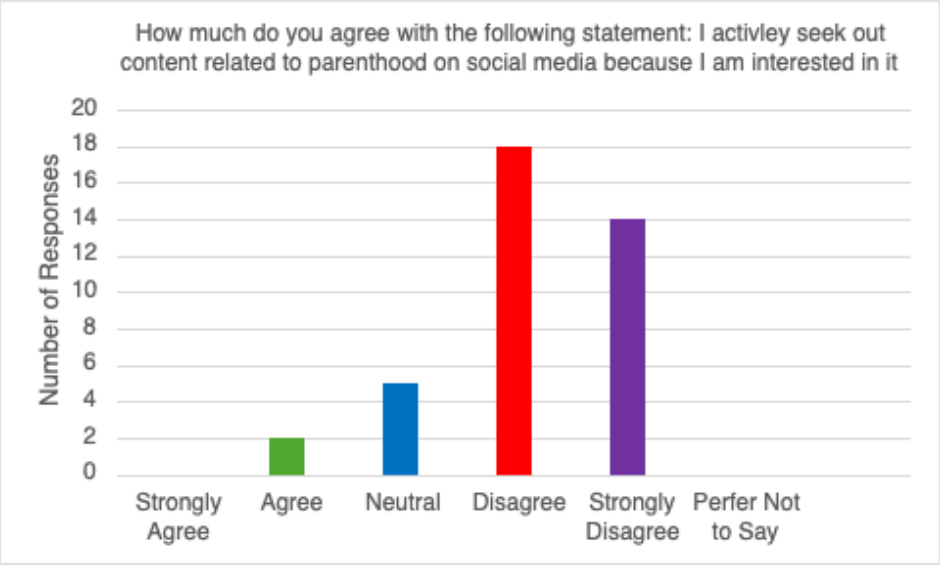


Figure 4 reveals that most participants encounter social media content related to parenthood passively, without actively seeking it. This underscores the relevance of such content in contemporary social media usage, indicating that encountering it despite lacking specific interest is common.

Figure 4

Come across parenthood-related content on social media without any interest

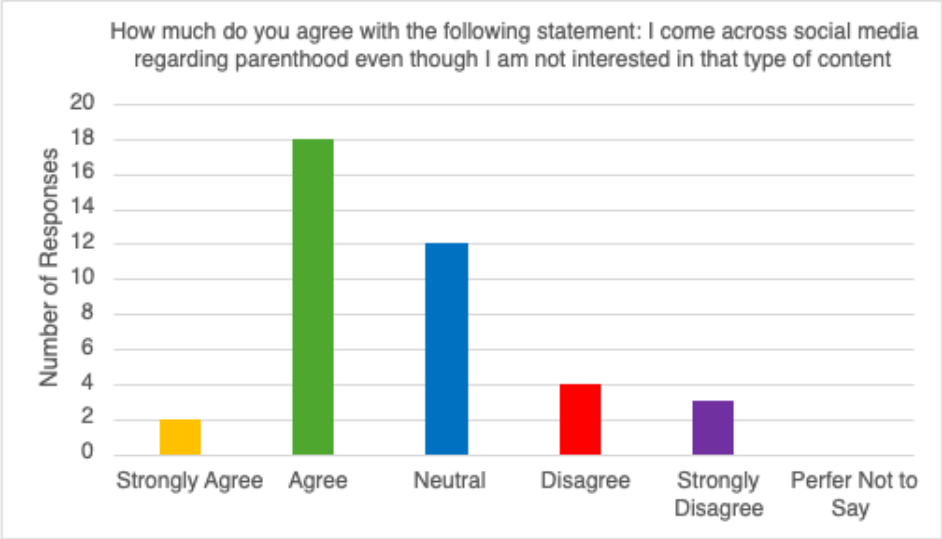


Figure 5
Social media's influence on stance on having children

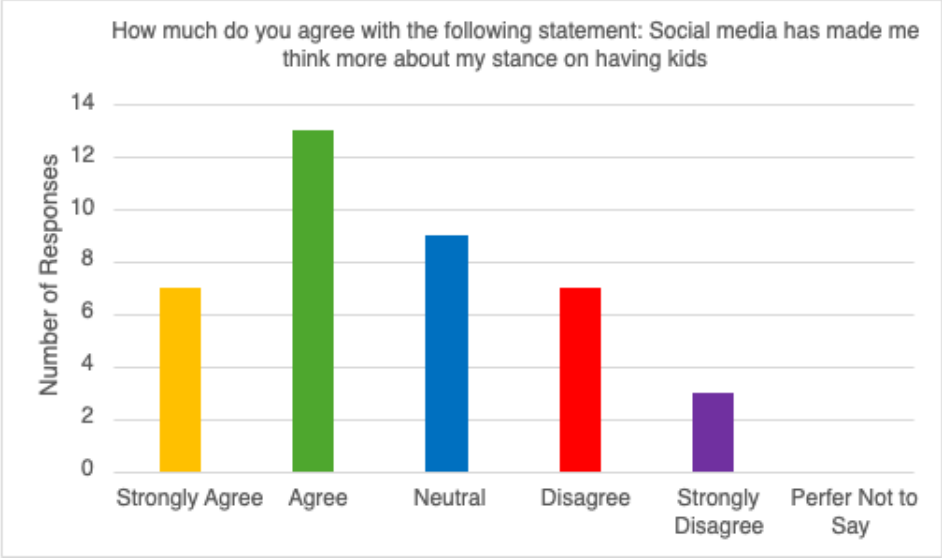


Figure 5 demonstrates that social media has influenced thoughts about future parenthood. This indicates that the content consumed on this topic is internalized, potentially significantly shaping our decision-making processes.

Figure 6 depicts the participants' desires regarding having children. The majority of responses indicate a desire to have children.

Figure 7 demonstrates whether our participants expressed a lack of desire to have children. The majority indicated disagreement with the statement, suggesting that they do, in fact, want to have children in the future.

Figure 6
Desire to have children

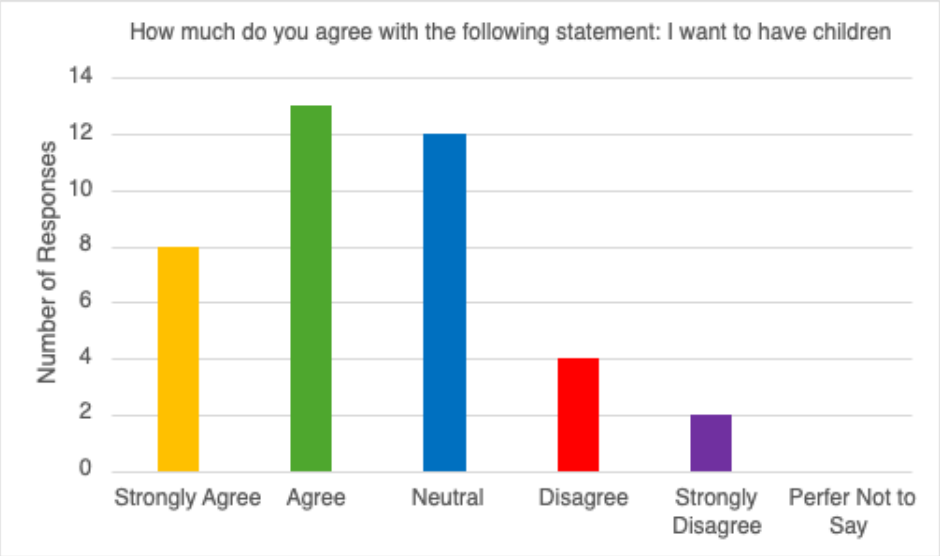


Figure 7
Desire to not have children

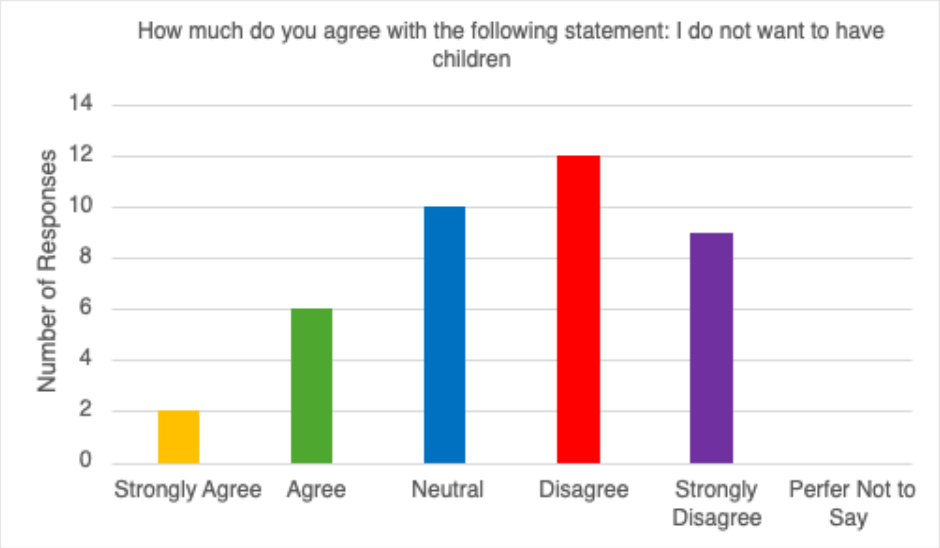


Figure 8 indicates whether participants were uncertain about having children. The majority disagreed with the statement, suggesting that many have already made a decision regarding their plans for future parenthood.

Figure 9 presented a question aimed at understanding the motivations behind the decision to have children. The graph indicates that the loss of independence was a contributing factor in this decision.

Figure 10 aimed to understand whether parenthood was a topic the age cohort considered and whether it was deemed important to discuss. The majority response

Figure 8
Unsure about having children

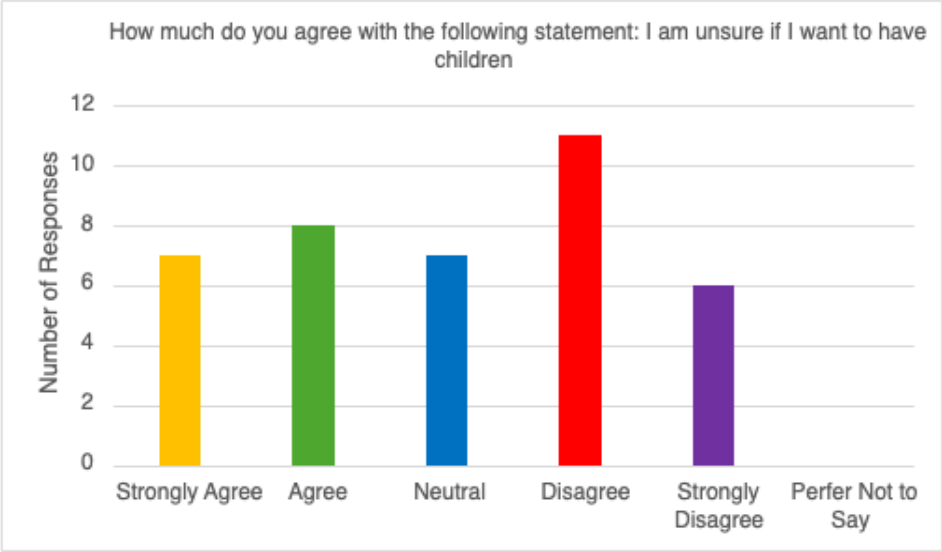
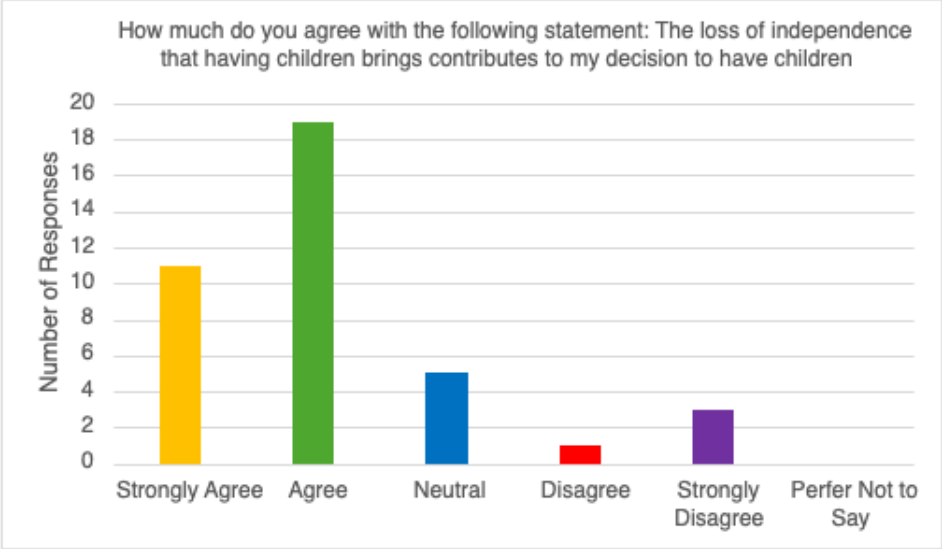


Figure 9

Loss of independence impacts decision to have children



indicates that our participants did not believe they needed to contemplate parenthood at their current age.

Figure 11 was designed to ascertain whether participants experienced fear and/or anxiety related to pregnancy. The graph reveals that the majority of our participants strongly agree with this statement.

Figure 12 asked if our participants had feelings of fear/anxiety surrounding birth. The majority of responses indicated that they strongly agreed with this statement.

Figure 13 delved further into the theme of anxiety and fear, this time focusing on parenthood. The graph indicates that the majority strongly agreed with the statement.

Figure 10

Do not need to think about having children

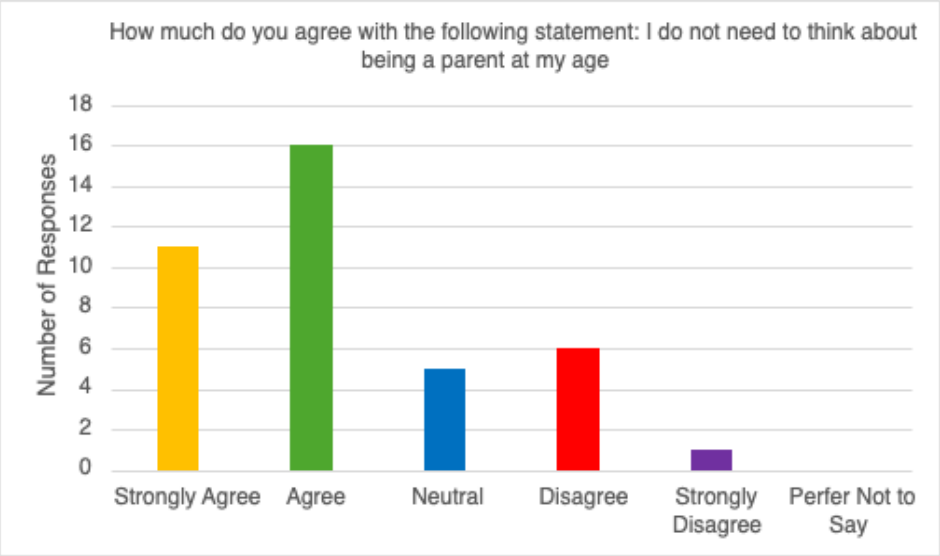


Figure 11

Fear and/or anxiety surrounding pregnancy

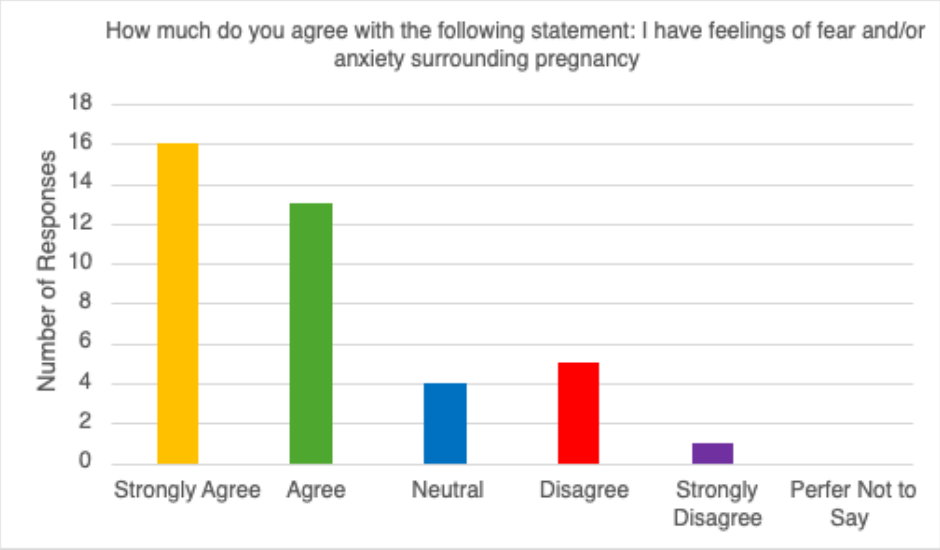


Figure 14 illustrates the level of skepticism among participants regarding the social media content they consume. The majority responded, "Somewhat often" to the question, with the fewest opting for "Rarely," and none selecting "Never."

Figure 15 depicts the responses of our participants regarding the extent to which their personal beliefs are influenced by what they consume on social media. The majority indicated "Somewhat often," while the fewest responses were for "Very often," and none selected "Never."

Figure 16 illustrates the responses of participants regarding whether they have gained new information from the content they encounter on social media. The predominant response was "Strongly agree," whereas "Neutral" received the fewest responses. Notably, no participants opted for "Disagree" or "Strongly disagree."

Figure 12
Fear and/or anxiety surrounding birth

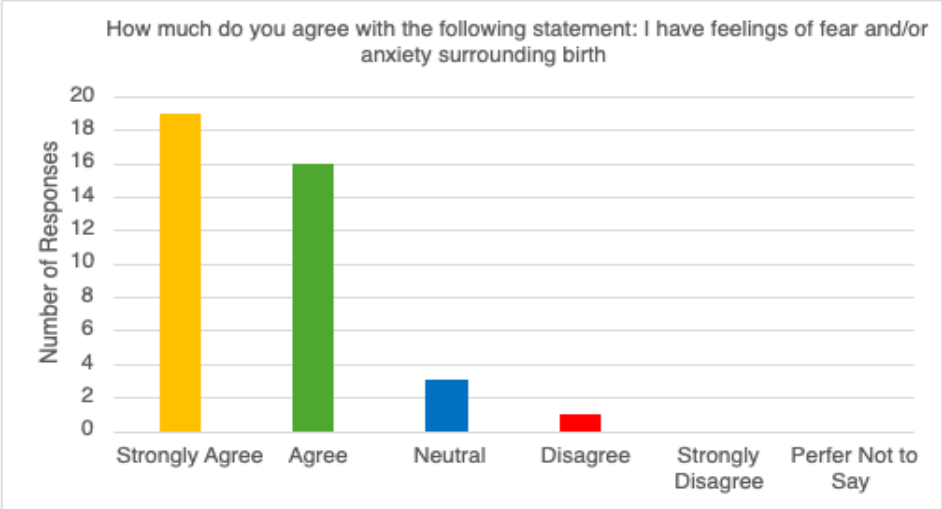
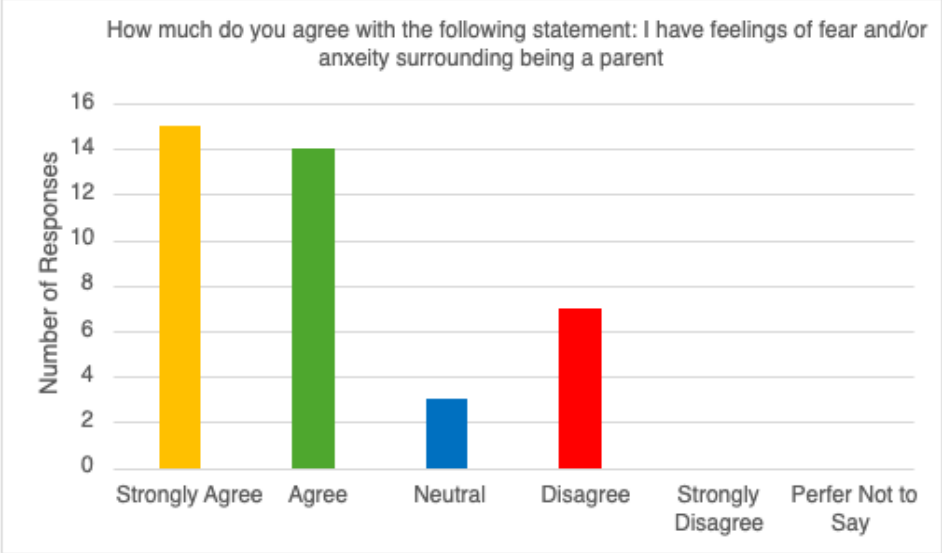


Figure 13
Fear and/or anxiety surrounding parenthood



The following statistical analysis incorporates correlation matrices to examine the relationship between two variables. These results were found to be statistically significant, providing valuable insights into the relationships among variables relevant to our topic. Interestingly, there was no discernible relationship between sexual orientation, religion, or relationship status, suggesting that these demographic variables do not influence attitudes towards parenthood.

Figure 17 displays the correlation matrix indicating a moderate positive correlation (r = 0.546) between beliefs about social media, skepticism towards social media, and learning from social media with one's stance on having kids (p = < 0.001). These three aspects were grouped into a continuous variable labelled ‘critical of social media”. These findings

Figure 14
Skepticism towards information learned on social media

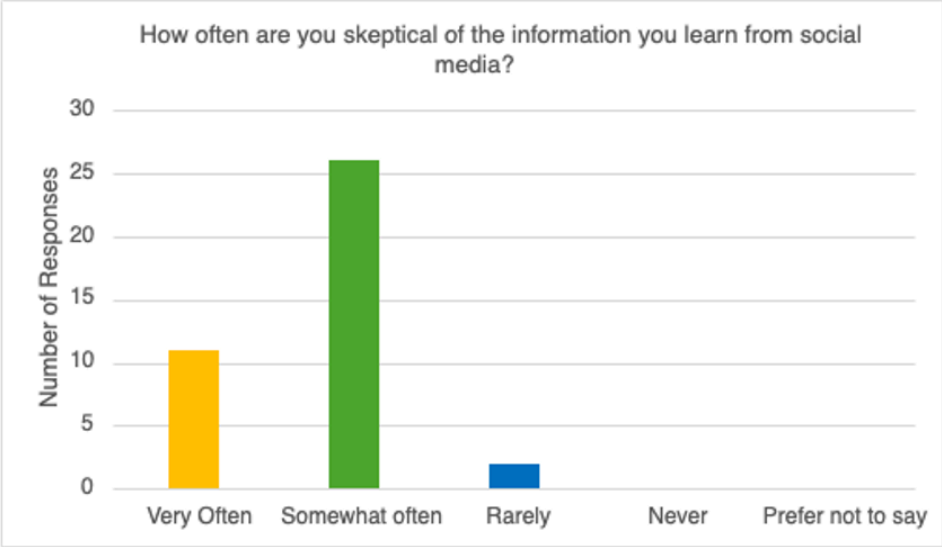
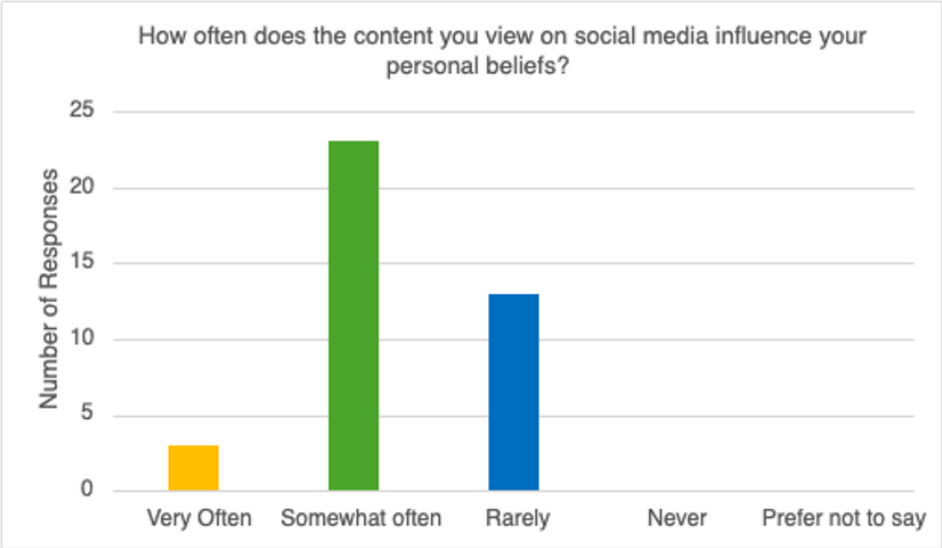


Figure 15
Social media influencing personal beliefs



suggest that regardless of whether participants believe or doubt what they see on social media, it influences their perspective on future parenthood. This aligns with our research, emphasizing the significant impact of social media on attitudes towards parenthood.

Figure 18 presents a correlation matrix examining the relationship between family structure and seeking parenthood-related topics on social media. This finding is particularly intriguing as it reveals a positive correlation (p = 0.048), specifically with single-family structures and blended-family structures. Notably, these unconventional family structures demonstrate this association with seeking parenthood content online. It is crucial to take into account the r-value (r =0.319), suggesting a weak positive

correlation between these two variables. Despite its weakness, this correlation remains significant

Figure 16

Learned new content from social media

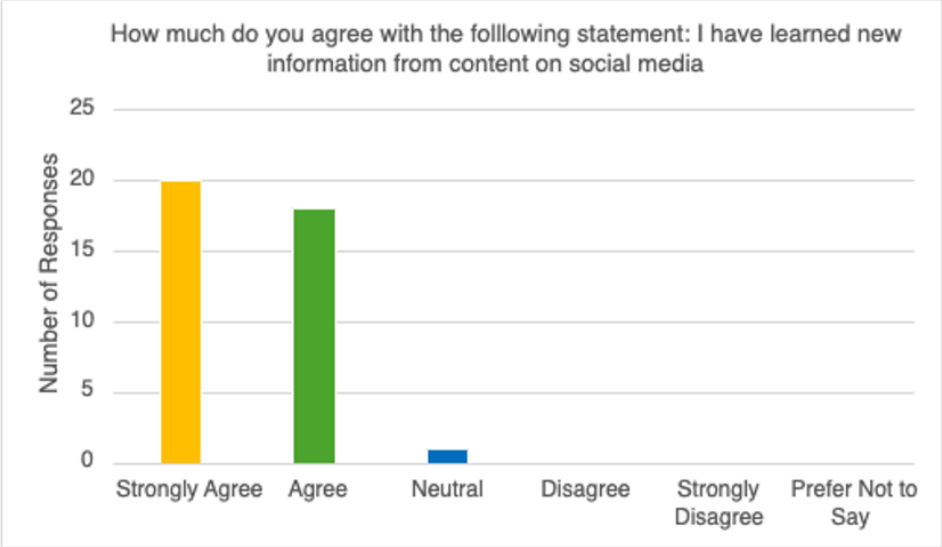


Figure 17

Social media and stance on having children

		Critical of Social Media	Stance on having children
Critical of Social Media	Pearson's r	-	
	p-value	-	
Stance on having children	Pearson's r	0.546	-
	p-value	< .001	-

for our research, as the observed relationship is unlikely to have occurred by chance alone. This suggests that one's family structure may influence the type of content actively sought online.

Figure 19 illustrates the correlation between fear of birth and various social media platforms. The data indicates a weak negative correlation (r = -0.383) between fear of birth and certain social media platforms (p = 0.016), notably TikTok and Instagram. This suggests that as fear of birth increases, usage of these platforms tends to decrease slightly. While this relationship isn't strong, it remains significant for our analysis.

Figure 20 presents the correlation matrix, highlighting a moderate positive correlation among beliefs about social media, skepticism towards social media, learning from social media, and fear of birth (p = 0.008). The results indicate that irrespective of participants' beliefs or doubts regarding social media content, it shapes their perspective on birth. This finding aligns with our research, emphasizing the substantial influence of social media on attitudes towards birth.

Figure 21 indicates a strong positive association between fear of pregnancy and fear of birth ($p<0.001$), alongside a moderate positive correlation between fear of parenthood and fear of pregnancy ($p = 0.036$). These correlations reveal an interdependence, suggesting that these fears tend to strengthen each other. This finding aligns directly with our research, emphasizing the interconnected nature of parental fears. Despite the latter correlation being weak, it still underscores the interrelatedness of these fears.

A correlation matrix examining the relationship between family structure and fear of parenthood, as seen in Figure 22, reveals interesting findings. The Pearson's correlation

Figure 18

Family structure and seeking parenthood-related content on social media

		Family Structure	Seeking Parenthood-related Content
Family Structre	Pearson's r	-	
	p-value	-	
Seeking Parenthood-related Content	Pearson's r	0.319	-
	p-value	0.048	-

Figure 19

Fear of birth and social media platforms

		Fear of birth	Social Media Platform
Fear of birth	Pearson's r	-	
	p-value	-	
Social Media Platform	Pearson's r	-0.383	-
	p-value	0.016	-

coefficient ($r = -0.418$) suggests a moderate negative correlation between these variables. This indicates that participants from different family backgrounds may experience differing levels of fear regarding parenthood. Furthermore, the correlation is statistically significant ($p = 0.008$), underscoring the importance of considering familial contexts in understanding attitudes towards parenthood.

The independent samples t-test is used to compare the means of two distinct groups to examine if there exists statistical evidence supporting significant differences in their respective population means. Notably, as shown in Figure 23, there is a significant divergence observed in social media platform usage between genders, meaning that there is strong evidence suggesting that the average use of social media platforms differs between males and females.

Figure 24 presents the use of a t-test to compare the mean attitudes towards social media between two distinct groups: individuals critical of social media and those from blended family backgrounds. The results highlight a contrast between these groups,

indicating potential differences in social media criticism based on family structure. Notably, the negative statistic suggests that the mean attitude towards social media in the blended family group is lower than that in the non-blended family group.

Qualitative Results

To better understand the rhetoric surrounding parenthood on social media, we employed 2 open-ended questions to ascertain what the themes and messages surrounding parenthood are.

Survey question 4 asked, “On which social media sites do you see more media surrounding parenthood?” The bar graph in Figure 21 shows that TikTok and Instagram were the most mentioned social media sites, with 21 and 19 mentions respectively. YouTube received 11 mentions, while Facebook and X received the fewest moentions.

Figure 20

Fear of birth and social media

		Fear of birth	Critical of Social Media
Fear of birth	Pearson’s r	-	
	p-value	-	
Critical of Social Media	Pearson’s r	0.419	-
	p-value	0.008	-

Figure 21

Fear of pregnancy and fear of birth and fear of parenthood

		Fear of Birth	Fear of Pregnancy	Fear of Parenthood
Fear of Birth	Pearson’s r	-	-	-
	p-value	-	-	-
Fear of Pregnancy	Pearson’s r	0.635	-	-
	p-value	< .001	-	-
Fear of Parenthood	Pearson’r	0.281	0.336	-
	p-value	0.083	0.036	-

Other social media sites not included in this graph such as Pinterest and Snapchat were not mentioned by any participants in response to this question.

Themes of Parenthood Content

Question 5 of the survey asked participants to describe the themes and messages of parenthood-related content that they view on social media. We provided examples of potential responses for participants including “positive/negative depictions of pregnancy, parenthood, and marital conflict.” Out of 39 participants we received 38 responses to

this question which were divided into 7 main categories. The first 3 categories include positive themes, negative themes, and mixed themes. Due to the ambiguity and open-endedness of this question, some participants provided specific parenthood-related topics or listed types of parenthood-related content rather than describing thematic categories of parenthood-related content. These responses were categorized into the 4 remaining groups and include common parenting topics, social media issues, parenting lifestyle content, and other parenthood-related topics. 2 responses were excluded for irrelevance and invalidity.

Figure 26 shows the number of times each theme appeared within participant responses. Each theme and category will be defined below.

Figure 22

Family structure and fear of parenthood

		Family Structure	Fear of Parenthood
Family Structure	Pearson's r	-	
	p-value	-	
Fear of Parenthood	Pearson's r	-0.418	-
	P-value	0.008	-

Figure 23

Social media platform and gender

		Statistic	df	p
Social Media Platform	Student's t	2.22	37.0	0.032

Positive Themes

Out of 38 responses, 13 responses contained answers relating to positive themes of parenthood content. Only responses that explicitly used the word 'positive' were categorized under this theme. Within this theme, eight respondents specifically mentioned positive depictions of parenthood, while only one participant mentioned positive depictions of pregnancy. Other examples of responses that were considered positive themes include:

- "Positive family dynamics…"
- "Positive themes"

Negative Themes

Next, six participants mentioned negative themes within their responses. Only responses that explicitly used the word 'negative' were categorized under this theme. Within this theme, 5 participants specifically mentioned negative depictions of

pregnancy, and only one participant mentioned negative depictions of parenthood. An example of a response that discusses negative themes is:

- "TikTok viral list of reasons to not have kids for women is a prominent message… negative depictions of pregnancy include women's self-esteem going down due to physical changes to their body."

Mixed Themes

Only four participants mentioned mixed themes surrounding parenthood within their responses. This category consists of responses that use the word "mixed" or "negative and positive" to indicate a blend or a variety of different portrayals of parenthood. Mixed themes point to participants being exposed to a well-rounded sample of narratives surrounding parenthood. An example of responses that were considered mixed themes include:

- "I see both negative and positive sides of pregnancy and parenthood. Sometimes it can be more bad than good just because things that are abnormally bad are more interesting and viral."

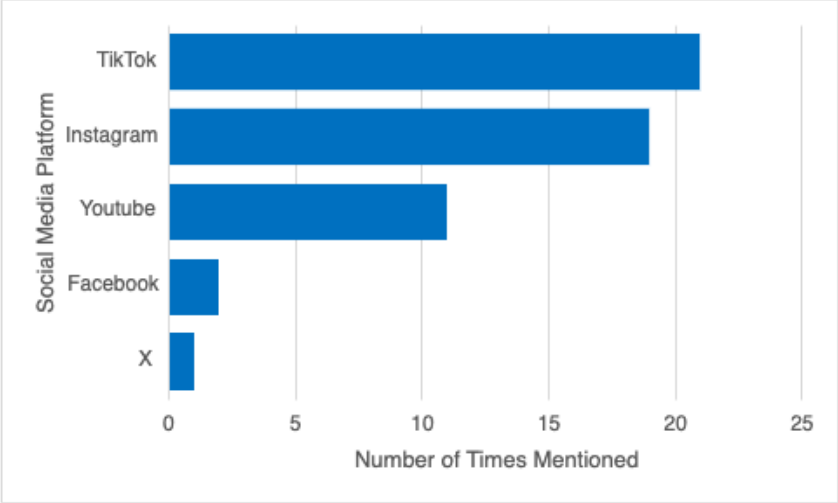
Figure 24

Critical of social media and having a blended family

		Statistic	df	p
Critical of Social Media	Student's t	-2.30	37.0	0.027

Figure 25

Social media sites where parenthood content is viewed



Note: The total count in Figure 25 exceeds the population size due to the participants being able to list as many relevant answers in their responses.

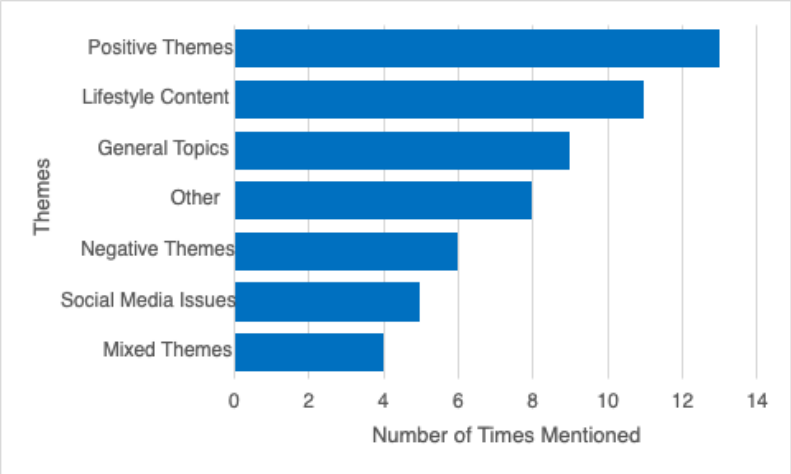
General Parenting Topics

General parenting topics were mentioned by nine participants within the 38 responses. This category consists of responses that mention general parenting topics, in that they are not explicitly positive or negative and are commonly discussed in the parenthood sphere online. Based on the types of responses that were given most frequently, three subcategories were identified: parenting tips/advice, parenting styles, and parenting challenges/struggles. An example of a response mentioned parenting tips/advice is:

- "Tips for parents, facts about pregnancy/newborns, life with young children, positive messages for mothers."

Figure 26

Themes in parenthood-related content online



Note: The total count in Figure 26 exceeds the population size due to the participants being able to list as many relevant answers in their responses.

An example of a response that was considered under types of parenting styles include:

- "Gentle parenting, Montessori parenting…"

A response that was considered to be parenting challenges/struggles is:

- "... Struggles of single parenthood…"

Social Media Issues

In total, five participants mentioned social media issues within their responses. This category demonstrates the ethical and moral concerns that participants have about parenthood content on social media. Under this category, participants address the problems that can arise from performing parenthood on an online public sphere. Examples of responses that discuss social media issues include:

- "... If they are not exploiting their child for views then it's typically about expecting children."
- "... on instagram I see a lot of moms and families glamorizing being a mom and using it more as a means to make money and make themselves look good."

Parenting Lifestyle Content

Lifestyle content appeared 11 times among the responses to this question. This category consists of responses that listed popular video formats of parenthood content rather than thematic or topical responses. These responses were not explicitly positive or negative but rather listed different types of parenting lifestyle content that are popular online. Examples of answers that discussed parenting lifestyle content include:

- “Tiktok would usually have things like ‘cooking for my toddler’, or ‘a day in the life of a *insert age here* mother’”
- “Family vlogs”
- “... pregnancy hospital stories”

Other Parenthood-Related Topics

Finally, eight participants mentioned other parenthood-related topics, which is a category that consists of topics that were mentioned less than three times. Out of 39 responses, two participants discussed feminism and parenthood, including “familial gender roles of women” and “feminist perspectives on parenthood.” In addition, two participants viewed parenthood content related to abortion, and one participant viewed parenthood content related to miscarriage. One participant discussed seeing a lack of male representation in parenthood content online, claiming that “rarely any men post about performing household duties or roles related to post childbirth.” Another participant mentioned “‘sad beige’ toy memes,” which point to the trend of neutral coloured toys and decor for children that prioritize parents’ desire for aesthetic harmony rather than the children’s development or preferences (Stechyson, 2022). Responses that were irrelevant to the topic of parenthood were not included in this category.

These themes and categories demonstrate the variety of different narratives surrounding parenthood that undergraduate students are exposed to on social media. Although there is an abundance of content surrounding parenthood online, we can assume that these are the most salient and influential topics for undergraduate students. Positive themes were the most popular category among parenthood-related content on social media with 13 mentions. However, negative themes and social media issues both contradict the positive themes and have a combined total of 11 mentions. Overall, undergraduate students have observed a myriad of different themes and topics surrounding parenthood online.

Discussion

Stance on Having Children

Firstly, our research revealed that most participating students feel that social media has influenced their stance on having children. This finding supports our research question as it concerns a direct relationship between social media and an attitude towards parenthood. Interestingly, the majority of participants agreed that social media has increased their contemplation on whether to have kids. This indicates a potential for attitudes to fluctuate and change according to what is viewed on social media. According to social learning theory, human behaviour is learned through the observation and imitation of others and is continuously altered in response to negative or positive reinforcements (Bandura, 1977). Positive and negative online reinforcements take the form of views, likes, shares, and comments that possess the ability to affect a larger audience (Deaton, 2015). Our qualitative data demonstrated that there are a variety of

conflicting representations of parenthood presented online. Therefore, we contend that undergraduate students are learning, imitating, and internalizing certain attitudes towards parenthood presented on social media.

Despite the majority of respondents indicating that social media has prompted them to consider their stance on having children more, much of our sample also firmly claims to want children in the future. Considering these findings in conjunction, it is likely that participants' desire for children is unstable or has been built upon parenthood content viewed on social media. These conflicting attitudes reflect the variety of opposing themes and messages surrounding parenthood on social media. Our qualitative data revealed that positive themes including positive depictions of parenthood were most commonly mentioned among respondents. However, negative themes and social media issues provided contradicting representations of parenthood and were also brought up by respondents. Berger & Milkman (2012) conducted a study on what makes content online go viral, finding that virality is partially associated with physiological arousal. Content that evokes high levels of positive or negative emotion resonates most with people online (Berger & Milkman, 2012). Both positive and negative themes can alter an individuals' attitudes and behaviours towards parenthood, as virality can serve as positive reinforcement. Therefore, the myriad of representations of parenthood online are likely causing undergraduate students to contemplate their stance on having children as new media is consumed. Attitudes towards parenthood are continuously altered in a fashion similar to what Bandura's (1977) social learning theory posits.

Social comparison theory can help explain why social media causes undergraduate students to think more about their stance on having kids. Social media adds another layer to social comparison theory as individuals compare their thoughts and ideas to others within the online sphere. Previous research has consistently found that social media is associated with social comparisons around body image and self-esteem (Lewallen & Behm-Morawitz, 2016). In particular, previous research has observed a connection between social media use, upward social comparison and negative affect (Lewallen & Behm-Morawitz, 2016). Our qualitative data demonstrates the sheer magnitude of different types of parenthood-related content, from family vlogs to memes. There is an abundance of differing attitudes and opinions that individuals likely compare themselves to. However, we can only assume that social comparisons made in relation to parenthood-related content online may influence or reinforce undergraduate students' attitudes towards parenthood. Further research is required in order to determine if individuals actively make comparisons to others online when consuming parenthood-related content.

Interest in Parenthood

Next, our study revealed that parenthood-related content continues to reach participants despite their lack of interest and failure to seek it out. This finding may suggest that parenthood-related content possesses a dominating presence within online spaces and intrudes participants' feeds unwillingly. However, O'Brien (2023) contradicts these results by highlighting the algorithmic systems embedded within most social media platforms. In order to filter out the excessive amounts of content available online, networks often tailor an individual's feed based on their likes, comments, and overall engagement with previous content (O'Brien, 2023). Consequently, it is likely that our

participants have inadvertently or passively interacted with parenthood-related content, prompting algorithms to prioritize similar material onto their feeds. They may watch parenthood-related content without actively interacting through likes or comments. Alternatively, participants may be feeding the algorithm by interacting with content that is implicitly related to parenthood. One of the categories found in our qualitative data was parenthood lifestyle content, which includes family vlogs, day-in-the-life videos, and storytime videos. These videos may not center conversations around parenthood directly, but they showcase various depictions of parenthood and families. Regardless, parenthood content is being consumed and evaluated in ways that can influence their personal perceptions. Future research should investigate normative online behaviours in relation to personal beliefs, values, and opinions surrounding parenthood.

Our study also found that the majority of participants do not feel that they need to think about being a parent given their age. This finding suggests that undergraduate students as an age cohort are collectively uninterested in parenthood, or simply not yet ready to consider parenthood in their lives. Previous research has consistently found that this stage of life is not characterized by considerations of parenthood (Peterson et al., 2012; Sørensen et al., 2016). In Western societies, postponing childbirth is increasingly common, and university students often report wanting children later in life (Peterson et al., 2012; Sørensen et al., 2016). Thus, respondents may claim to be currently disinterested in parenthood while still wanting children in the future.

Fear and Anxiety

Our research has found that respondents strongly agree with the statement that they experience fear and/or anxiety surrounding pregnancy, birth, and parenthood. We explored these fears and/or anxieties by asking respondents how much they agree with statements regarding having feelings of fear and/or anxiety related to pregnancy, birth, or parenthood. All three of these statements were surveyed separately, however, the majority of respondents strongly agreed with all three questions. Fear of birth and fear of pregnancy were strongly positively correlated. Furthermore, fear of parenthood and fear of pregnancy were also strongly positively correlated. This means that participants who were fearful of birth often had fears surrounding pregnancy, and those who feared parenthood were also likely to fear pregnancy. These findings are consistent with literature on adults' perspectives on pregnancy and birth (Fenwick et al., 2009). It is important to note that many studies researching the topic of fear of birth and pregnancy focus on those who may already be pregnant rather than young adults who do not yet have children. Given the little research that has been done on young adult's opinions on pregnancy, birth, and parenthood, and our survey results pointing towards there being a fear, it can be assumed that younger adults share the same fear as those who are older or already expecting a child.

Our research has shown that young adults are likely to have feelings of fear and/or anxiety surrounding the whole experience of parenthood, from pregnancy through the course of parenthood. Volková & Dušková (2015) emphasize this finding in a study that uncovered specific fears in emerging adulthood, one of them being fears regarding becoming a parent. Each new phase of parenthood is associated with different challenges and changes (Karimi et al., 2021), which can explain respondents reporting fears surrounding each stage of becoming a parent. We observed that fear of one

aspect of parenthood can increase fear in other phases of parenthood, which may be influenced by the threats to one's freedom and independence. Our research found a positive correlation between fear of parenthood and loss of independence which reflects the existing literature on this topic. A study by Laney et al., (2015), discovered that becoming a mother was associated with experiencing a sense of self-loss.

Interestingly, our research has found that wanting children is positively associated with the fear of pregnancy, birth, and parenthood. This reflects the existing literature on attitudes towards parenthood, where university students also reported high levels of wanting kids (Peterson et al., 2012; Sørensen et al., 2016). Although respondents tend to fear the process of becoming a parent and parenthood itself, they still desire to have children. There is very little academic literature on fearing the process of becoming a parent while also still having future parental desires. Most of the current literature is in the form of magazines, blogs, and newspaper articles. Our research finding opens the opportunity for more research to be done in this area and provides a foundation for the nuanced feelings individuals can have towards parenthood. Further research should analyze conflicting feelings towards parenthood and how social media may influence these contradicting attitudes.

Skepticism and Influence

Despite the majority of respondents stating that they are skeptical towards what they learn on social media somewhat often, they also responded similarly when asked if social media influences their personal beliefs. This finding is directly related to our research question as it underscores how social media can influence personal beliefs and attitudes towards parenthood. Most significantly, participants acknowledged that social media can change their personal beliefs even after considering their skepticism towards social media. Thus, we can assume that undergraduate students incorporate information learned on social media using critical thinking and media literacy skills. Social comparisons and positive and negative reinforcements likely help individuals evaluate what to believe online. Valsesia et al., (2020) discovered that the number of individuals that an influencer is following can be an indicator of trustworthiness and credibility for viewers and marketers. Further research should examine how micro-interactions on social media can serve as negative and positive reinforcements as viewers consume information online.

Regardless of skepticism towards social media, almost all respondents reported that they had learned new information from social media in the past. A study by Vraga & Tully (2019), found that individuals who were more news literate and valued media literacy were more skeptical towards the quality of information on social media. In contrast, Moravec et al., (2018) examined fake news on social media, uncovering that individuals could not distinguish fake news from real news, and were highly prone to confirmation bias. In terms of parenthood content, it is likely that undergraduate students believe and value content that they already agree with. However, parenthood-related content online is dissimilar to misinformation in that content that confronts individuals' beliefs is not wrong or fake. For example, a person who plans to have children but is exposed to negative depictions of pregnancy cannot deem these depictions false or distorted. Therefore, undergraduate students often cognitively

evaluate information consumed on social media before deciding to incorporate the information into their personal beliefs.

We grouped together the questions about skepticism, having learned new information from social media, and having social media influence personal beliefs. These three questions were found to be positively correlated with fear of birth. Perhaps the skepticism towards social media combined with the openness towards learning from social media leads undergraduate students to be more cautious and wary of childbirth. This association suggests that social media content related to childbirth is salient for undergraduate students. Unfortunately, there is a lack of academic literature concerning social media's influence on negative attitudes towards childbirth, and parenthood in general.

Demographic Considerations

Given the wide variety of demographic characteristics represented by our respondents, we find it paramount to discuss in detail the influence that certain demographic characteristics appear to have, or do not have, on topics related to our research. To begin, our research shows that there is a significant difference in social media usage across genders. Female respondents were found to spend more time daily on social media when compared to their male counterparts, which is consistent with current literature (Twenge & Martin, 2020). Additionally, female respondents report using a larger variety of social media apps compared to male respondents. Specifically, only female respondents reported using Pinterest, although, no female respondents reported coming across parenthood-related content on Pinterest. Furthermore, male respondents reported less use of TikTok than female respondents. This finding has significant implications for our research as TikTok was reported as the app where respondents most frequently came across parenthood-related content. Considering TikTok's popularity amongst females and the abundance of parenthood-related content on TikTok, it can be assumed that females encounter parenthood-related content more frequently than males. Unfortunately, there has been no recent academic research that analyzes how male adolescents generally conceptualize parenthood.

Additionally, an interesting finding that our research uncovered was that sexual orientation, religion, and relationship status were insignificant when compared to attitudes relating to birth, pregnancy, and parenthood. To explain, differences in sexual orientation, religious affiliation, and relationship status among our respondents was not significantly related to any parenting attitudes. Existing literature emphasizes that queer individuals think about whether or not they want kids to a similar degree as their straight counterparts (Pralat, 2015). However, differences occur as queer individuals must consider potential paths to parenthood in ways that heterosexual couples do not (Pralat, 2015). In terms of religious affiliation, our findings are inconsistent with current literature that recognizes religion as an indicator for desiring children and viewing parenthood as one's duty (Yancey & Emerson, 2018). Surprisingly, we found that religious affiliation was not correlated with believing that everyone should have children. This finding may have been influenced by the high number of respondents who identified as having no religious affiliation.

Finally, the type of family structure that respondents grew up in correlated strongly with feelings of fear surrounding parenthood. Additionally, family structure was positively

correlated with seeking parenthood-related content on social media. The specific family structures that were associated with seeking parenting-related content on social media include the single-parent family structure and the blended family structure. This demonstrates that the family structure that one grew up in can impact how much parenthood-related content one seeks out on social media. Interestingly, individuals who grow up in these types of nontraditional family structures seek parenthood-related content on social media. Perhaps this finding demonstrates that individuals who desire this type of content are seeking structure or "normalcy" within online representations of families. A study by Gibson found that YouTube bereavement vlogs served as "channels of emotional supply" for viewers, which demonstrated how many aspects of life are now mediatized (2016). Similarly, individuals from single-parent and blended families may derive pleasure or comfort from positive family representations online.

Conclusion

Summary of Findings

Our research supports our initial hypothesis by demonstrating that social media does indeed influence undergraduate students' perceptions of parenthood. Our participants indicated that social media content influences their personal beliefs, with social media directly impacting their contemplation towards having kids. We found that the majority of our participants have feelings of fear and/or anxiety regarding pregnancy, birth, and parenthood. Furthermore, these feelings were significantly associated with wanting children in the future. Our study reveals that regardless of whether people are interested in parenthood-related content, they are still consistently exposed to it and influenced by what they view. Interestingly, we also found that one's sexual orientation, religion, and relationship status, are unrelated to their attitudes towards parenthood. Lastly, our research also reveals that social media presents both positive and negative depictions of parenthood, as there is a myriad of different types of parenthood-related content. In terms of pregnancy and birth, participants reported seeing more negative depictions, while parenthood content was more positive in comparison. Overall, social media impacts attitudes towards parenthood regardless of skepticism, personal interest, or religious affiliation.

Limitations

Despite best efforts, no study is without limitations. Firstly, the theories used for this research do not directly focus on social media interactions. Rather, social learning theory and social comparison theory are grounded in the evaluation, comparison, and imitation of the behaviours one witness (Festinger, 1954; Bandura, 1977). Nonetheless, behaviours on social media can be similarly observed and used as positive or negative reinforcements.

Secondly, the generalizability and reliability of our study is in question. Given that fatherhood is underrepresented throughout social media, men may not be exposed to as much relevant parenthood-related content online. This reflects our sample population, as only eight men (20.5%) completed our survey. Men may have been uninterested in participating in a study on parenthood because parenthood itself is stereotypically a feminine domain (McHale & Huston, 1984). Additionally, with only 39 participants in total and a highly homogenous sample population, results are not

generalizable beyond North American undergraduate students. Our sample consists only of undergraduate students, underrepresenting men, sexual minorities, and other gender minorities. Furthermore, the use of convenience sampling signifies that our results may not be replicable. Nevertheless, these findings are still compelling, especially when looking at a generation of future parents who are strongly connected to social media. This study is the first of its kind within social psychological research and can inform future studies that aim to explore the relationship between social media and parenthood.

Lastly, we cannot definitively measure a relationship of causation between social media and participants' perceptions of parenthood. There is a myriad of other factors that can influence attitudes towards parenthood in conjunction with social media such as adverse life experiences, skewed depictions of parenthood online, and other forms of media. In addition, existing attitudes towards parenthood may be unchanged or simply reinforced by content viewed on social media. Future research should examine the interdependent relationship between social media and personal values and beliefs.

Significant Insights and Contributions

Our study provides noteworthy findings regarding the relationship between social media and perceptions of parenthood. We address the gap in research on how social media impacts attitudes towards parenthood, drawing these socially significant topics together. Our findings contribute to this field by revealing various important implications of exposure to parenting content on social media. For example, our findings shed light on the previously unaddressed fear that undergraduate students have towards pregnancy, birth, and parenthood. This concern should be followed over time to see the true implications of exposure to negative parenthood content on social media alongside pre-existing fear and anxiety.

Moreover, our findings indicate that exposure to parenting content on social media may be unavoidable. The majority of participants reported that they come across parenthood-related content even though they are not interested in it. This demonstrates that parenthood is a prevalent subject within social media content. This is an extremely important finding since it suggests that parenting content on social media is ubiquitous. Our research findings, which highlight a link between exposure to parenting content and perceptions of parenthood, suggest a significant influence on how society views and understands parenthood. Future research should consider these findings and evaluate the potential risks of such permeating social media content.

Final Thoughts

In conclusion, this research aided in filling the gaps in existing literature by focusing on the relationship between social media and perceptions of parenthood. Social media has been on the uprise; therefore, understanding how our ideologies and perceptions are shaped by social media is essential. Despite the limitations of this study, our findings are important to consider when evaluating how social media influences individuals' personal values and beliefs. While these findings may not apply to the general population, this group of undergraduate students demonstrates the undeniable influence of social media, which should be further explored in relation to other populations. Future research should aim to explore the specific messages social media

content spreads, regarding parenthood for both women and men. Additionally, future research should include a longitudinal study to evaluate how perceptions change from one point in time to another, potentially revealing a clearer understanding of causal relationships. We hope this research inspires others to consider the influence social media has on their perceptions of parenthood. We anticipate that future research will build on our findings and reveal more about this fascinating phenomenon.

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Social media, social comparison, and its impact on mental health and well-being of McMaster University undergraduate students

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Abstract

While social media use in Canada continues to rapidly increase, university students are also experiencing unprecedented levels of mental health concerns and crises (Primack et al., 2017; Wiens et al., 2020). Given these trends, it has become increasingly important to examine the ways in which social media use may or may not play a role in mental health outcomes. Due to the multifaceted nature of social media use, our research sought to specifically examine social media use though the lens of social comparison. The present research questions aimed to investigate the relationship between social media, social comparison, and McMaster University undergraduate mental health outcomes. Utilizing a mixed methods approach, our team created and distributed an online anonymous survey which included both quantitative and qualitative questions. This survey accumulated 14 complete responses, in which statistical software was used for quantitative analysis, and thematic analysis used for the qualitative responses. Our research found that while participants did report engaging in social comparison, when focusing specifically on mental health outcomes after social media use, participants reported positive, rather than negative, experiences and outcomes. The ever increasing and multifaceted nature of social media use among younger generations calls for the continued presence of critical research regarding this topic. The present research has made a critical contribution to the existing literature on this subject by discovering a caveat to much of the existing findings. That is, that social media use, even when instigating social comparison, may not affect one's mental health or can even produce positive mental health outcomes for users.

Introduction

With approximately one in five university and college students experiencing mental health issues, Canada is currently facing an unprecedented mental health crisis among its postsecondary student population (Wiens et al., 2020). This crisis is founded upon two components — high levels of mental health concerns among university students, and rising enrollment levels at universities in Canada (Wiens et al., 2020).

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Interestingly, at the same time, society is facing a continuing rise in the use of social media (SM) platforms (Primack et al., 2017). While SM is conceptualized as having a variety of beneficial impacts on everyday life, in some cases the impacts may be negative (Primack, et al., 2017). A few of these adverse effects in relation to mental health are increased anxiety, depression, loneliness, dissatisfaction with body image, fear of missing out, thoughts of self-harm or suicide, and decreased life satisfaction (Sadagheyani & Tatari, 2021). While these two components may not be intrinsically linked, they may be able to provide insight into one another, as well as the larger issue at hand.

Our research sought to investigate the relationship between SM, social comparison, and the mental health of McMaster University undergraduate students. Variables such as the type of SM platform used, the type of content being consumed, and the vulnerabilities of the individuals accessing SM were investigated. By doing so, our research aimed at contributing to the existing literature on SM and the mental health of university students. Further, we hoped to advance the literature on this issue by investigating the relationship through the specific lens of social comparison.

This paper will first outline the theories relevant to our area of inquiry and contextualize and operationalize those theories within our specific research. We will then state the problem and purpose of our research, as well as the specific questions our research attempted to answer. Next, we will provide a thematically organized and detailed review of the current literature. Following the literature review, the methodology of our research will be outlined and a list of the topics our paper will discuss will be provided. The paper will continue with a discussion of the limitations of our study and a section on the significant insights our research is able to provide. A conclusion and summary section will follow.

Theory

Social comparison theory was used as the dominant theoretical framework for our research, contextualizing student social media use and mental health outcomes. Social comparison theory was first proposed by Leon Festinger in 1954, who sought to understand the process by which people compare themselves as a means of evaluating themselves. Festinger (1954) argued that individuals are innately driven to evaluate themselves, specifically on their opinions and abilities. Additionally, Festinger (1954) theorized that when people are lacking in objective data on which to base their evaluations, they evaluate their opinions and abilities by comparing them to those of others. Individuals are more likely to make lateral comparisons, meaning that they tend to compare themselves to those who share similar opinions or abilities, as this increases the accuracy of one's self-evaluation (Festinger, 1954). Festinger (1954) also suggested, however, that individuals in Western societies are more inclined to make upward comparisons; they compare themselves with those whose abilities are slightly better than theirs, due to a continuous desire to improve themselves. However, the tendency to engage in upward social comparison is not relevant in regard to evaluating one's opinions (Festinger, 1954).

Throughout the late 19th century, researchers began to hypothesize that social comparison might influence self-esteem (Dijkstra et al., 2008). When individuals compare themselves to those they consider worse off, this serves to improve their

self-esteem, especially in times of stress. This type of comparison is referred to as a downward social comparison (Buunk et al., 1990). As such, modern scholars agree that individuals do not always strive for accurate self-appraisals and may in fact be more biased when evaluating themselves (Dijkstra et al., 2008). Additionally, there are a variety of possible motives for comparing oneself to others beyond the mere desire to evaluate and improve oneself (Dijkstra et al., 2008). Currently, social comparison theory can be used to examine the processes by which individuals compare their own characteristics to those of others (Dijkstra et al., 2008).

Social comparison theory is relevant to the current study as it was used to frame, ground, and conceptualize our research. This theory has been utilized in many studies related to SM use because people often engage in social comparison when using SM. A recent study regarding social comparison and SM use amongst college students found that most of the participants made at least one social comparison while using SM each day during the study (Andrade et al., 2023). Moreover, individuals who tend to make more social comparisons are more likely to experience negative effects of SM than individuals who make less comparisons (Andrade et al., 2023). Our study aimed to determine what types of social comparisons undergraduate students make, and how these comparisons can subsequently influence student mental health and well-being. For example, how likely are students to make upward comparisons versus downward comparisons, and how do these comparisons affect students' mental health? Also, what types of people and SM platforms are associated with higher levels of social comparison and problematic social media use (PSMU)?

An individual's well-being may be impacted in various ways when using SM, depending on the nature and frequency of the social comparisons that are being made. Prior research has confirmed that engaging in social comparison can worsen one's self-esteem, which can have a multitude of mental health implications, including higher rates of anxiety (Anto et al., 2023). Upward comparisons often have the most detrimental impact on well-being, though this is not always the case (Andrade et al., 2023). Upward comparisons can negatively influence well-being when an individual compares themselves to others that they deem to be more successful in any given domain. However, focusing on what similarities exist between someone and the object of their upward comparison can foster more positive and hopeful feelings in that individual (Andrade et al., 2023).

The nature and frequency of social comparisons could be influenced by several factors. That is, different populations may be inclined to engage in different comparisons. For example, a recent study found that students are more likely to make comparisons regarding lifestyle and body image (Anto et al., 2023). Bodily comparisons can impact student's self-evaluations which oftentimes leads to more feelings of anxiety (Anto et al., 2023). This finding exemplifies how social comparison theory can be used to understand the relationship between SM use and student mental health. Moreover, popular SM platforms, such as Instagram, tend to be highly image-based which can exacerbate the social comparisons being made. As well, it can amplify any of the related negative effects that may emerge from these comparisons (Anto et al., 2023). Therefore, it was beneficial that our group examined the SM habits of students, as well as social comparison trends.

To better examine and understand student SM habits and trends, our group considered Katz, Blumler, and Gurevutich's (1973) uses and gratifications theory. This theory explains the ways that people utilize media and communication outlets "to satisfy their needs and to achieve their goals" (Katz, Blumler, & Gurevitch, 1973, p. 510). During the early development of this theory, academics had not come to a consensus as to exactly which needs and gratifications were being satisfied by media use (Katz et al., 1973). Katz and Blumler (1973) argued that different mediums of media influence audiences differently, and thus vary in their ability to satisfy different needs. It was also proposed that a variety of social factors create needs related to media consumption for members of society (Katz et al., 1973). In modern societies, the increasing frequency of SM use (Primack et al., 2017) may coincide with a broader impact on users. Additionally, the needs being fulfilled by SM may be greater or more complex than the needs which were fulfilled by past forms of media.

A recent study on the PSMU of students noted seven gratifications of SM use: maintaining relationships, socializing, presenting a more popular self, task management, passing time, entertainment, and educational purposes (Kircaburun et al., 2020). The results of this study suggested that certain uses and gratifications are associated with PSMU (Kircaburun et al., 2020), which has implications for our current study. Uses and gratifications theory is relevant to our research, as it helped us to understand and determine why SM use can become problematic. As well, it aided in explaining why users continue to engage despite the prevalence of negative effects (Primack et al., 2017).

Primarily, we used Festinger (1954)'s theory of social comparison to contextualize our research. Since this theory has been expanded upon since its initial development, we made certain to consider modern understandings and additions that have been done. As well, we considered the uses and gratifications theory when analyzing student SM use. The use of this theory helped to provide insights into the development of media throughout recent decades.

Statement of the Problem and Purpose of the Research

Social media is a relatively recent phenomenon, and while there are mixed opinions on the impact that it has on individuals' well-being, SM use continues to be frequently utilized amongst young adults (Primack et al., 2017). The current study aimed to further the research on SM use amongst undergraduate students by examining habits and trends in SM usage and the consequential effects. We examined how SM use, social comparison, and mental health may be associated through an engagement with social comparison theory. We hoped to discover the ways in which SM could impact the mental health of undergraduate students at McMaster University. Determining how SM use could negatively influence mental health and wellbeing is critical because we feel that understanding the causes of the issue is pertinent to help resolve it.

Research Questions and Justification

The questions we attempted to answer in our study were constructed with the intention of generating a well-informed observation of the usage of SM and how it may induce social comparison. Our research questions were made to be wide-ranging to obtain as much knowledge as possible on how we can solve the issue of harmful social

comparison. The main questions we asked focused on two main themes, the first of which is the students' experiences and tendencies surrounding social comparison. Through this lens, we asked the following questions: Is social comparison a harmful factor of social media usage among students? How likely are students to make upward comparisons versus downward comparisons? How do these comparisons affect students' mental health? What aspects of their lives are students mostly comparing (Body image, academic standing, economic status, etc...)? How might the amount of time that a student spends using social networking sites influence their likelihood in engaging in social comparison? We selected these questions because we believed that they would provide some insight into the patterns between types of social comparison and the toll that may or may not have on the mental health of students. We felt that by answering the questions above, we would be able to investigate if a problem exists among McMaster students, and if so, how we may be able to implement strategies to alleviate it.

The second theme we explored is the connection between certain SM platforms and how they may incite social comparison. Following this theme, we aimed to answer the following questions: What types of social media platforms are associated with higher levels of social comparison and problematic social media use? How does the frequency of social media use precipitate social comparison? How do students feel after using social networking sites? Which social media sites evoke the most downward social comparisons? The most upward social comparisons? These questions helped us to find which of the social networking sites prove themselves to be the most detrimental to mental health. Using this knowledge, we hope to able to introduce strategies that decrease problematic use, and in turn, may help to eliminate the negative impacts that social comparison leads to. There is a seemingly growing presence of SM in modern Western society (Primack et al., 2017). Because of this, determining how problematic social networking use occurs and persists may help to innovate better habits and behaviours when navigating the internet.

Throughout the research process, the questions above were modified and augmented, as some questions became irrelevant, and new inquiries emerged. However, the original questions provided our study with a foundation to build our research upon, as well as helping us gain insight into the three following areas. Primarily, we hoped to investigate how social comparison may impact students' mental health and wellbeing. Next, we strove to identify how SM can be used in a productive way that could minimize harmful social comparisons. Finally, we wanted to determine which social networking sites produce the most detrimental comparison behaviours.

Literature Review

The following literature review contains information from a number of studies that contain themes relating to our research project. The topics that we have chosen for our review are social comparison, SM use, and the impacts that SM use can have on mental health. The literature provides deeper insights into the three main themes, which helped inform our study, and allowed for a more well-rounded research project. For instance, the research below discusses the various types and domains of social comparison, such as downward, upward, lateral, physical, ability, and opinion. Further, the literature provides insight on the various types of SM use, such as active, passive,

and problematic. Finally, the impacts of SM on mental health have been analyzed through the domains of mental illness, body image and expectations of beauty, and well-being. The literature provides further insights into the main themes mentioned above, which helped to advise the course of our study, and allowed for a more well-rounded research project.

Types of Social Media Use

The quality of an individual's SM use can significantly influence how they are impacted by SM. There are a variety of terms used to differentiate between different types of SM use. Many researchers categorize social media use as either active or passive. More recently, PSMU has also been put forth as a category of social media use.

Active Versus Passive

Research on the types of social media use is still evolving, and in many ways is still quite limited (Thorisdottir et al., 2019). The research that has been published indicates that there is a correlation between types of SM use and mental health outcomes. Active SM use can be understood as generating personal content, engaging in direct exchanges (i.e., chatting or commenting back and forth with others) and regular status updates (Pang, 2021; Thorisdottir et al., 2019). Opposingly, Passive SM use involves consuming content without direct communication or interactions with others (i.e., browsing, scrolling, reposting) (Pang, 2021; Thorisdottir et al., 2019).

One study by Pang (2021) surveyed 318 Chinese university students ages 18 to 29 about their use of a popular social networking site among Chinese populations titled *WeChat*. The researchers sought to investigate the correlation between how social networking sites are used and the social and psychological consequences that may follow. In this study, passive use of WeChat was found to positively predict "upward social comparison", which in turn was linked with elevated levels of "depressive mood and fear of missing out" (FOMO) (Pang, 2021, p.7). The author did not indicate any significant correlations between active WeChat use and negative social and psychological outcomes (Pang, 2021).

Another study conducted by Thorisdottir et al., (2019) used results from a national survey of 10,563 Icelandic adolescents ages 14-16. The researchers found that time spent on SM was the most significant factor that impacted one's symptoms of depression and anxiety. However, when time was controlled for, the passive use of SM related to greater depression and anxiety symptoms in both girls and boys, while active use contributed to fewer of these symptoms (Thorisdottir et al., 2019). Both of these studies are relevant to our current research as they demonstrate that the way SM is used may influence social comparison tendencies and mental health outcomes of users.

Problematic Social Media Use

Many researchers have also defined certain modes of SM use as problematic. Kircaburun et al., (2020) found that differences in personality, usage, and levels of gratification derived from SM use may lead to the development of PSMU in certain individuals. According to these researchers, PSMU shares similarities with behavioral and chemical addictions. Individuals with PSMU exhibit compulsive behavior, along with symptoms of addiction such as mood swings, withdrawal, and relapse (Kircaburun et

al., 2020). PSMU is frequent among university students, and multiple studies argue that women experience PSMU more so than men (Kircaburun et al., 2020). Certain uses and gratifications associated with SM may lead to PSMU, and using SM to pass time may be one of the largest predictors of PSMU, followed by portraying oneself in a positive light (Kircaburun et al., 2020).

Further, Banyai et al., (2017) examined the prevalence of PSMU with a sample of 16-year-old adolescents living in Hungary. The results were similar to the data from the study by Kircaburun et al., (2020) showing that adolescents who used SM in their daily lives were at a higher risk of experiencing withdrawal symptoms, low self-esteem, and being diagnosed with depression (Banyai et al., 2017). In addition, Kircaburun et al., (2020) argued that women are at greater risk of experiencing the harmful symptoms that can arise due to overuse of SM. Similarly, as found by Banyai et al., (2017) females using SM for over thirty hours per week have decreased self-esteem and have more severe symptoms of depression than males. Moreover, this study critiqued previous research on the topic of PSMU, arguing that the data has depicted an over-representation of the female population (Banyai et al., 2017).

Lastly, Hou et al., (2019) examined how SM addiction is related to college students' mental health and academic performance. They found that individuals with SM addiction are often severely concerned with media presence and have the uncontrollable urge to constantly log onto SM platforms (Hou et al., 2019). The authors noted that individuals with SM addiction experience symptoms that affect their mood, cognition, physical and emotional state, as well as interpersonal and psyche behavior (Hou et al., 2019). Their results differed from Kircaburun et al., (2020) and Banyai et al., (2017) as they not only aimed to address how SM use can impact mental health, but also academic performance. In doing so, they found that not only did SM addiction negatively affect mental health, but also poorly affected academic performance (Hou et al., 2019). Interestingly, Kircaburun et al., (2020) and Banyai et al., (2017) found that excessive use of SM is associated with lower levels of self-esteem. However, Hou et al., (2019) found that although SM appears to be related to lower self-esteem, they did not find a significant correlation as previous research has suggested.

Impacts of Social Media on Mental Health

Many previous studies have revealed a strong relationship between SM use and anxiety in adolescents (Andrade et al., 2023). While PSMU is, unsurprisingly, linked to impaired psychological well-being (Kircaburun et al., 2020), it is not the sole explanation for the relationship between social media and anxiety in young people. Another explanation is that SM use results in behaviors which worsen symptoms of anxiety and other mental health disorders (Anto et al., 2023). For example, higher levels of SM use could contribute to impaired sleep and an increase in sedentary practices, which can ultimately cause an individual to experience worsened mental health or well-being (Anto et al., 2023). Additionally, an individual’s anxiety levels may be influenced by a variety of other “metrics of social media activity”, like the number of social media accounts they use or the frequency at which they check these accounts (Anto et al., 2023, pg.2). Moreover, the nature of each SM platform could influence how users engage with the platforms (Andrade et al., 2023), thereby impacting the potential influences each SM platform may have on student mental health.

Mental Illness

Another mode by which SM can impact users' mental health is through the social comparisons made by users themselves. In their recent study on SM use and anxiety, Anto et al., (2023) found that participants' anxiety was increased through several factors, and they noted that comparison was one of the major contributors to anxiety in their participants. Upward comparisons often have the worst impact on well-being because these comparisons are associated with "more negative self-judgments, lower self-esteem, and the presence of disordered eating behaviors" (Andrade et al., 2023, pg.2). When individuals make an upward comparison that subsequently lowers their self-esteem, this often leads to increased anxiety (Anto et al., 2023).

Considering the nature of popular SM platforms was also important for our research purposes. The image-based nature of many popular SM platforms like Instagram and Snapchat may be an important factor when considering the impact of SM on student mental health. These visual platforms increase the likelihood that students will make upward social comparisons, especially in the domains of performance and physical appearance (Andrade et al., 2023). What's more, researchers have already found associations between PSMU and the use of Instagram and Snapchat. (Kircaburun et al., 2020).

However, it should be acknowledged that studies have also found evidence that SM use can be beneficial to an individual's mental health and well-being in certain cases. SM can decrease anxiety as it can provide individuals with positive experiences, social connectivity, and the opportunity to temporarily "escape" life stressors or mental health issues (Anto et al., 2023).

Body Image and Expectations of Beauty

Body image and expectations are reflected in society's constructs of ideal body type and what is considered 'beautiful' (Jiotsa et al., 2021). These conceptions are created through socialization and are therefore learned from others (Jiotsa et al., 2021). The ever-changing definition of beauty can have serious consequences when it comes to an individual's physical, emotional, and psychological well-being. The role of SM has been empirically proven to feed into body image issues along with body dissatisfaction (Jiotsa et al., 2021).

According to Jiotsa et al., (2021), SM can play a role in how individuals perceive their bodies. Some people are vulnerable and will go to extreme lengths to attain an ideal body, having internalized this body image as 'beautiful'. As a result, some individuals develop eating disorders or use cosmetic surgeries to address their psychological distress (Jiotsa et al., 2021). The study by Jiotsa et al., (2021) sampled young adults who were 15 to 35 years of age, and who used SM often. Researchers measured how often participants posted on their SM, how they felt when looking at other users' posts, and sought to examine any eating disorders. Results indicated that participants who compared themselves to others had a higher levels of personal body image dissatisfaction, and "a higher drive for thinness" (Jiotsa et al., 2021, p. 10). Individuals who are not satisfied with their body have increased levels of anxiety and shame, which can lead to unhealthy coping responses (Jiotsa et al., 2021). Unfortunately, the image-based nature of many contemporary SM platforms makes

them rich environments for users to make comparisons, particularly regarding their physical appearance (Andrade et al., 2023). What's more, Andrade and colleagues (2023) noted that certain content, such as fitness or beauty content, is appearance oriented and may thus facilitate users in making upwards social comparisons specifically.

Well Being

Current empirical evidence notes that increased screen time can lead to negative psychological well-being because of upward social comparisons (Pittman & Reich 2016). As a result, self-esteem can be easily lowered if images seen on SM trigger a negative response (Vogel et al., 2015).

Pittman & Reich (2016) suggest that increased SM usage can be associated with loneliness. SM allows users to interact and construct an identity to stay connected amongst others, thus a higher frequency of use may occur as a result. However, this increased screen time does not always equate to greater cohesiveness (Best et al., 2014). Research indicates that increased screen time can be detrimental to some users as it imposes risks to an individual's physical, psychological, social, and mental well-being (Pittman & Reich 2016). In a study conducted by Pittman and Reich (2016), a sample of 274 undergraduates were asked to rate their preferences, happiness, and loneliness on SM platforms they regularly used. Results indicated that image-based platforms affected users more than text-based platforms (Pittman & Reich 2016). This emphasizes that photos and videos employ stronger emotions and feelings of communication and may therefore affect the psychological well-being of individuals more.

Overall, research highlights how SM sources, such as image/video-based platforms (i.e. *Tik Tok*, *Instagram*) can give a sense of immediacy and intimacy amongst users (Pittman & Reich 2016). However, the same effect is seen less prevalent in text-based outlets (i.e., *Twitter*). Thus, the influence and effects from image-based platforms create a negative psychological state for some users.

Similarly, Vogel et al., (2014) examined the associations between SM, social comparison, and self-esteem. As mentioned earlier, studying SM use can provide insight into the types of habits formed when using these platforms. Simply put, self-esteem can include self-evaluations and self-perceptions (Vogel et al., 2014), which can relate to one's tendency to make upward or downward social comparisons. The study examined 145 undergraduates and attempted to measure whether increased Facebook use decreased their life satisfaction. The results indicated that a higher frequency of Facebook use led to poorer self-esteem (Vogel et al., 2014).

A second study involved participants looking at two bogus SM profiles, one being for someone who was perceived to be successful and attractive and one for someone who was deemed to be unsuccessful and unattractive (Vogel et al., 2014). Results indicated that some individuals had lower self-esteem following being exposed to the fictitious successful and attractive individual.

Types of Social Comparison

Depending on the way that an individual uses social comparison, the act itself can be typified in three different ways (Kong et al., 2021). As mentioned earlier, the

three types have been coined as upward, downward, and lateral. In the subsections below, the focus will be primarily on upward and downward, outlining how these behaviours manifest and when they can become problematic.

Upward

Due to the constant availability of information and stimuli that can be found on SM, social comparison is almost an inevitable component of the experience (Kong et al., 2021). Because of the generally positive nature of the posts that individuals tend to broadcast on social networking sites, users tend to engage more in upward social comparisons (Park et al., 2021). While this may result in individuals feeling good about themselves, large amounts of upward social comparisons can become harmful to their mental health and overall well-being (Schmuck et al., 2019). Schmuck et al., (2019) sought to find a connection between four factors: SM use, upward social comparison, self-esteem, and mental well-being. A link between these elements had not yet been researched at this level of specificity to date. What they found was that when an individual engages in upward social comparison on SM sites, this behaviour tends to have negative influences on their self-esteem (Schmuck, et al., 2019).

While the research above provides an important perspective regarding the impact of social comparison on self-esteem and well-being, the following study conducted by Park et al., (2021) examines the possible link between upward social comparison and the emotions that may arise as a result. Further, Park et al., (2021) wanted to explore what kinds of behaviours individuals engage in when confronted with those complicated emotions. It seems that many studies primarily focus on the psychological implications of upward social comparison, therefore the researchers in the present study wanted to analyze how this kind of comparison breeds certain behaviours (Park et al., 2021). The behaviours range from posting negative or positive comments on SM to discontinuing use all together. They found that upward social comparison did in fact play an important role in determining what influences individuals to engage in these behaviours (Park et al., 2021). This is due in part to the fact that upward social comparison is a causal component in the development of upward contrastive emotions, which the researchers found was a pivotal marker for the behaviours (Park et al., 2021).

Based on the findings from Schmuck et al., (2019) and Park et al., (2021), we conducted our research with well-rounded knowledge surrounding the impacts that upward social comparison can have on individuals while using SM. We understood the potential effects on self-esteem and well-being, as well as on emotions and behaviours. Noting the limitations that these studies possessed, we foresaw these challenges and avoided them to the best of our abilities.

Downward

Fuhr et al., (2014) sought to investigate the differences between how each style of comparison would affect an individual's self-esteem and mood. In addition, they examined how social comparison would impact affective disorders. A total of 132 patients, all with a clinically diagnosed disorder, were recruited for the study. Participants were randomly assigned to complete a computer-based brainstorming task that would induce either upward or downward comparison (Fuhr et al., 2014). Through the assessments of the participants moods the researchers found that, unlike the

negative effects of upward comparison on one's mood and self-esteem, downward comparison brought a boost in positive affect (Fuhr et al., 2014). This finding is consistent with prior studies on downward comparison.

Research by Gentile et al., (2019) attempted to further the knowledge surrounding the effects of downward comparison on one's affect. The researchers recruited 496 undergraduate psychology students to participate in their study. Participants were divided into one of four conditions: loving-kindness, interconnectedness, downward comparison, and control (Gentile et al., 2019). The downward comparison condition was asked to walk around a hall full of people and compare themselves in aspects that they were better at (Gentile et al., 2019). After, they were asked to write about their experience and complete a survey (Gentile et al., 2019). However, contrary to the researcher's hypothesis, the results of the study found that downward comparison did not lead to any beneficial effects on mood when compared to the control condition (Gentile et al., 2019). These conflicting findings suggest that further research on the effects of downward comparison is needed to better our understanding of downward social comparison.

Domains of Social Comparison

Social comparisons can be made in several different domains. In his classic social comparison theory, Festinger (1954) only speaks to two domains: opinion and ability. When considering ability, it is important to consider the range of abilities which an individual could be comparing, such as academic, athletic, or artistic. Researchers today acknowledge that comparisons are made across a much broader range of domains than originally theorized by Festinger (1954), such as physical appearance or lifestyle. The image-based nature of modern SM platforms may, as previously mentioned, make these platforms especially rich environments for individuals to make upward comparisons, especially pertaining to performance and physical appearance (Andrade et al., 2023). Post-secondary students may be most inclined towards making social comparisons in the domains of lifestyle, body image, and academic performance (Anto et al., 2023).

Physical

Esiyok & Turanci (2017), surveyed 381 university students to understand the relationship between media and physical appearance comparisons or body ideals. Their research sought to answer questions such as the following, "What is the relationship between having negative attitudes towards one's own body and the desire to look like people in the media among males and females?" and, "What is the relationship between having negative attitudes towards one's own body and comparing it with the people in the media among males and females?" (Esiyok & Turanci, 2017). The results of this study found that if individuals developed negative attitudes about their bodies, both males and females equally attempted to look like the people they saw in the media (Esiyok & Turanci, 2017, p. 3). Significantly, having negative attitudes about one's body was positively correlated with comparing bodies with those in the media (Esiyok & Turanci, 2017). Furthermore, the research found a significant negative correlation between self-esteem and bodily comparison with those in the media, suggesting that as

self-esteem decreases the tendency to compare or desire to look like those in the media increases (Esiyok & Turanci, 2017).

Another study by Scully et al., (2023) administered self-report measures to 210 female Irish students between the ages of 12 and 17 on topics such as “online appearance related activity, social comparisons to female target groups, internalization of the thin idea, body dissatisfaction, and self-esteem.” (p. 31) The results of these self-reported measures found “a positive association between body dissatisfaction and adolescents frequency and favourability of comparisons to [both] proximal and distal female targets on Facebook” (Scully et al., 2023, p. 35). The comparisons the participants made were all found to be upward, with the participants finding their body least favourable (Scully et al., 2023). Participants found their bodies least favourable in the face of comparison to “celebrities, followed by distal peers, close friends, and finally, family” (Scully et al., 2023, p. 35).

These findings are relevant to the current study as they highlight a type of comparison individuals are likely to make when consuming media content. The significant relationships found in this study display the importance of investigating university students’ tendencies to socially compare themselves with others regarding body image.

Ability & Opinion

As mentioned above, ability and opinion are the two most common domains of social comparison which have been studied by researchers for various purposes and with differing outcomes. Comparison of ability and opinion appear to be most often studied together to observe their similarities and differences. Lewin et al., (2022) examined the different domains of social comparison that may be associated with PSMU on five platforms: Facebook, Instagram, Snapchat, TikTok, and Twitter. The authors note that research involving more than one social networking site *and* PSMU are few and far between, indicating that most of the research exists on one or the other. Lewin et al., (2022) found that the higher an individual’s tendency to compare themselves to others, in terms of ability on SM, the more problematically they used the platforms. Interestingly, when an individual compared their opinions to others, the researchers found that they only used two out of the five platforms problematically (Lewin et al., 2022). The authors theorize that this may be due in part to the tendency to compare one’s abilities is greater than opinion and given the content that is advertised on most SM platforms, social comparison of ability would then result in more widespread PSMU (Lewin et al., 2022).

The study discussed above outlines how the different domains of social comparison can influence how an individual uses SM. However, Yang et al., (2018) sought to examine how the domains of social comparison on SM, when partnered with introspective processes (i.e., rumination and reflection), come together to impact identity distress. The researchers pointed out the differences between the two domains and how they typically present themselves. When engaging in comparison of ability, the individual views the other as an object that must be competed with and they reflect upon themselves to evaluate whether they are inferior or superior to the other (Yang et al., 2018). Contrarily, when the individual engages in comparison of opinion, the individual views the other as a source of information or may even look to this person for guidance

(Yang et al., 2018). It is important to distinguish between the two domains because they may result in more distinctive behaviours. The results of this study indicate that when partnered with rumination, comparison of ability resulted in increased identity distress for the participants. Opposingly, when combined with reflection, comparison of opinion did not result in an indication of identity distress (Yang et al., 2018).

The two studies above provide contrasts between behaviours of SM use and the domain of social comparison, as well as how the domain can impact identity construction when partnered with introspection. The findings provide us with a groundwork which proved to be of great use during our study. Most prominently during the data collection period of our project, when analyzing how participants use SM platforms, and in turn, how that makes them feel.

Limitations

The literature reviewed above provides strong insights into the various elements of our research— SM, social comparison, and potential impacts on mental health. While each of the reviewed studies and articles can in some way contribute and strengthen our understanding of the topic at hand, they are not without their limitations. Each paper examines a variety of limitations to their work, however, only those limitations relevant to the study at hand will be examined.

Firstly, much of the literature has poor generalizability to wider populations. Park et al., (2021) limited their sample to participants in the country of South Korea. Esiyok & Turanci (2017) only collected data from Turkish university students. Similarly, Samara et al., (2022) sampled only Australian university undergraduates, Gentile et al.'s (2019) participant were recruited from the same American university, and Pang (2021) limited their study to Chinese university students. Vogel et al., (2015) focused solely on a student population from an unidentified Midwestern university in the United States. Thorisdottir et al., (2019) limited their population to Icelandic adolescent population. Scully et al., (2023) restricted their population of interest to adolescent Irish girls. Finally, the participants in Lewin et al., (2022) were only those of an early-adult age. Thus, the narrow participant criterion of these studies limited the populations they can generalize their findings to. Our research is not able to avoid this limitation as we are only sampling McMaster undergraduate students over the age of 18. However, this limitation will be acknowledged in the designated section towards the end of the paper.

Another common limitation across literature was the limited analysis of the various types of SM platforms. Pang (2021) only produced hypotheses and results around the analysis of the WeChat platform. Similarly, Vogel et al., (2015) only produced findings around Facebook. Interestingly, Esiyok & Turanci (2017) focused on media—television, movies, magazines, and newspapers—more generally, in turn completely neglecting the fast-growing popularity of SM as the source of social comparisons. In only examining one media or platform type, these studies are narrowing the scope of their research and the relationships they may uncover. The current study will not be limited to one SM platform. As a result, we can build on the mentioned limitation by highlighting the differences in social comparison and mental health outcomes based on the type of SM platform being used by participants.

Methodology

To investigate the relationship between SM, social comparison, and their impact on undergraduate students' mental health, we chose a mixed method approach to data collection by utilizing both qualitative and quantitative survey questions. This selection aimed to safeguard participants' anonymity, considering our research delves into intimate details of their lives. The use of an online anonymous survey ensured the protection of participants' identities and enabled us to ask more personal questions without compromising confidentiality. This decision enables participants to feel comfortable responding freely and honestly. The research was approved by the McMaster Research Ethics Board (MREB#: 0327).

Sample Population and Recruitment

Our sample population was undergraduate McMaster students over the age of 18. The survey was hosted on LimeSurvey, and our goal was to have 80 participants complete it. To achieve this target, each member of our group reached out to various clubs and faculty leaders asking for their cooperation in sharing our letter of information (Appendix A) with their members.

Specifically, Maxima reached out to the Black Student's Association, McMaster Chinese Student's Association, Filipino McMaster Student Association, McMaster Afghan Students Association, and McMaster German Cultural Club. Rachel contacted Girl Up McMaster, Macswifties, MacCrafters, and the McMaster Sikh Students Association. Sarah reached out to the McMaster Academic Trivia Club, McMaster Sign Language Club, McMaster Geeks, McMaster Ukrainian Students Association, and McMaster Board Game Society. Zara contacted the McMaster Mindfulness Club, McMaster Book Club, and the Korean Culture and Language Club (KCLC). Christy connected with the Muslim Students' Association, Queer and Trans Colour Club (QTCC), McMaster Italian Cultural Club, and Middle Eastern Students Association. Lastly, Jessica reached out to the McMaster Bengali Student Association, McMaster Turkish Students Association (MTSA), McMaster French Club, and McMaster Indian Association.

We sent recruitment emails to the groups listed using a script (Appendix B). Within our recruitment emails three documents were attached: a letter of information (Appendix A), an email recruitment script for participants to be used by the holder of the participants contact information (Appendix C), and a poster containing all the information on how to access the survey (Appendix D).

Due to a conflict of interest, Sarah, who was a teaching assistant for SOCPSY 1Z03 and a member of Macswifties, did not contact either group to avoid any sense of obligation among potential participants to engage in our research. Furthermore, to prevent any unintentional conflicts of interest, we refrained from recruiting through departments, faculty, program offices, or personal social media channels. All communications with potential participants were conducted through third parties, using posts that contained our survey information.

The sampling methods we utilized were convenience sampling and snowball sampling. For practicality and ethicality, our participant recruitment took place within McMaster University. To ensure straightforward and accessible engagement with a wide range of participants, we selected various clubs within McMaster that varied demographically. Participants encountered our recruitment efforts through posters

placed in the student center, libraries, and other buildings around campus which included tear-off tabs with the survey QR code (Appendix E). They could also discover our survey through electronic recruitment posters (Appendix D), shared by clubs or societies on their SM platforms, providing an electronic link to the survey. Finally, we anticipated that participants who completed our survey would share it with their friends, thus helping to enlarge our study's pool of participants.

Procedure

When students decided to complete the survey, they would click on a link that would take them directly to the study's consent page. Here, they would come across the letter of information which outlined all the details of the study including any risks associated with participation. This page also included support resources and poster session information. At the end of this first page of the survey, participants were met with two options. If participants had read the page and clicked 'yes', they agreed and were giving their implied consent to participate and were taken directly into the study. Once they entered the study, they were asked to complete a 16-question survey, with 5 demographic questions and 11 questions related to their personal SM usage and social comparison tendencies (Appendix F). The questions were designed to uncover how undergraduate students engage with SM, how they compared themselves when using SM, and the emotions elicited during and after SM use. If they selected 'no', they did not consent to participate in research and would be taken to the end page where they were thanked for their time and given information on the poster session. If participants choose to complete the survey, it was estimated to take about 10-15 minutes to complete. The participants were encouraged to choose a private location to complete the survey, so long as they had access to devices with stable internet connection.

On November 15, 2023, we launched our survey and began participant recruitment, followed closely by the dispatch of recruitment emails. In early January, we received approval for physical posters, which were then displayed on approved bulletins to attract passing students to complete our study. The survey concluded on February 16th, and we promptly initiated the data analysis phase. The data was stored on the LimeSurvey platform as it ensured that the data was housed on a secure platform with password protection. When retrieving the data from LimeSurvey, the file was also protected with a password on a secure laptop. Only the members affiliated with our research had access to this confidential data. The data will be deleted no later than April 30th, 2024, or once Dr. Clancy has advised us that the marking has been completed and the data can be deleted.

Ethical Considerations and Challenges

Our research survey carries two potential risks: psychological and social, both of which were no greater than those in everyday life. The psychological risks pertain to the possibility of participants feeling embarrassed, uncomfortable, worried, or upset due to the nature of the questions being asked. On the other hand, social risks encompass situations where the survey is completed in a public setting, potentially exposing participants' responses, and compromising their privacy. Additionally, another social risk exists if participants engage with social media posts related to the research. When they

like or comment on a post related to the research, their identity could be known and that may have social or psychological risks and consequences for the individual.

To mitigate the psychological risk, we used an online anonymous survey. Additionally, our recruitment was done through third-party channels to ensure that there was no conflict of interest. Furthermore, we also have support resources on the letter of information as well as the end page for those who might have felt uncomfortable after the survey. Participants were also free to leave the survey at any time if they did not feel comfortable, up until the point of submitting the survey. After this point, the data could not be deleted due to the anonymous nature of the survey. To mitigate the social risks, we kindly asked participants to complete the survey in a private location and to refrain from responding, posting, or liking anything regarding the survey to keep their privacy and anonymity intact.

Throughout our research, we encountered several challenges, including gatekeeping, survey fatigue, and issues with generalizability. Gatekeeping refers to the difficulties we face in accessing specific research populations. During our recruitment process, our team struggled to reach certain demographics because group leaders either failed to respond or rejected our requests to share our research survey. This obstacle significantly limited the size as well as the diversity of our study. Survey fatigue also posed a significant challenge to our research. The length and content of the survey may have led some participants to experience fatigue, causing them to abandon the survey before completion. This issue limited the number of responses we could include in our data analysis. With gatekeeping and survey fatigue, another challenge our research faced was the generalizability of results. Due to the limited response and homogeneous participants, our findings lacked generalizability. This limitation of our sample may not represent broader populations or different demographic groups. Consequently, while our insights provided valuable initial understandings, they should be interpreted with caution and viewed as a stepping-stone for further, more diverse studies.

Data Analysis

Upon the completion of the data collection phase, our data analysis was conducted using Jamovi, an open-source statistical software. For the quantitative component of our study, data analysis was conducted using statistical software to perform a series of tests, including descriptive statistics, cross-tabulations, contingencies, chi-square test, and independent samples t-tests. This quantitative analysis allowed us to process the Likert scale questions. Descriptive statistics offered a preliminary understanding of the sample's demographics, SM usage patterns, and general attitudes. Cross-tabulations helped explore the relationships between variables, such as the correlation between S usage and mental health outcomes. T-tests provided insight into differences between groups, for example, comparing the mental health impacts of SM across different grade point average (GPA) ranges and years of study.

In analyzing the qualitative data, our study employed thematic analysis to identify patterns and insights from participants' open-ended responses. This process involves systematic coding of responses to identify key ideas and experiences related to SM use and social comparison. Through examination of these codes, broader themes were

identified and defined, such as positive, neutral, and negative emotional responses, as well as the variability of these emotions across different SM platforms.

Due Dates	Tasks
October 19, 2023	Submit Research Proposal
November 1, 2023	Revision to Research Proposal
November 11, 2023	Revision of Research Proposal sent to Dr. Clancy
November 12, 2023	Ethics Approval Received
November 15, 2023	Open Survey to Public
November 17, 2023	Overview of Research Project
November 22, 2023	Begin Participant Recruitment after ethics approval was received: Recruitment emails sent
January 10, 2024	Participant recruitment: Reminder recruitment emails sent
January 18, 2024	Participant recruitment: Physical posters posted
February 16, 2024	Survey closed to Public
End of February 2024	Select program and begin data analysis
March 3, 2024	Submit Draft Copy of Poster
March 4, 2024	Received Feedback on Draft Copy of Poster
March 6, 2024	Submitted final poster to Dr. Clancy and Jess
March 20, 2024	Poster Presentation
March 28, 2024	Final Thesis Paper Submitted

Quantitative Results

Demographics

Data collection occurred among a sample of 62 participants, of which 48 were removed for lack of adequate completion (all but one response never went beyond the consent page, and the one response that did, did not complete at least 75% of the survey). Thus, the total number of participants for this research was 14 McMaster undergraduate students (n=14). The mean age of our participants was 20.3 with a standard deviation of 1.27. Of the 14 participants, 2 were 18 (14.3%), 1 was 19 (7.1%), 4 were 20 (28.6%), 5 were 21 (35.7%), and 2 were 22 (14.3%). Most of the respondents were female, with 11 respondents identifying as such (84.6%); 1 identifying as gender queer (7.7%), 1 identifying as non-binary (7.7), and 1 missing response. Within our sample, 8 respondents identified as White or Caucasian (61.6%), 2 identified as

Chinese (15.4%), 1 identified as Asian (7.7%), 1 identified as a person of colour (7.7%), 1 as Pakistani (7.7%), and there was 1 missing response. The majority of our respondents were in year 4 with 6 participants selecting that response (42.9%); 2 were in year 1 (14.3%), 1 was in year 2 (7.1), and 5 were in year 3 (35.7%). Regarding faculty of study, 12 participants identified as belonging to the faculty of social sciences (85.7%), 1 to the faculty of science (7.1%), and 1 to the faculty of health science (7.1%). Lastly, most participants' GPA was within the A-range with 12 respondents selecting that option, and the remaining 2 participants were within the B-range (14.3%).

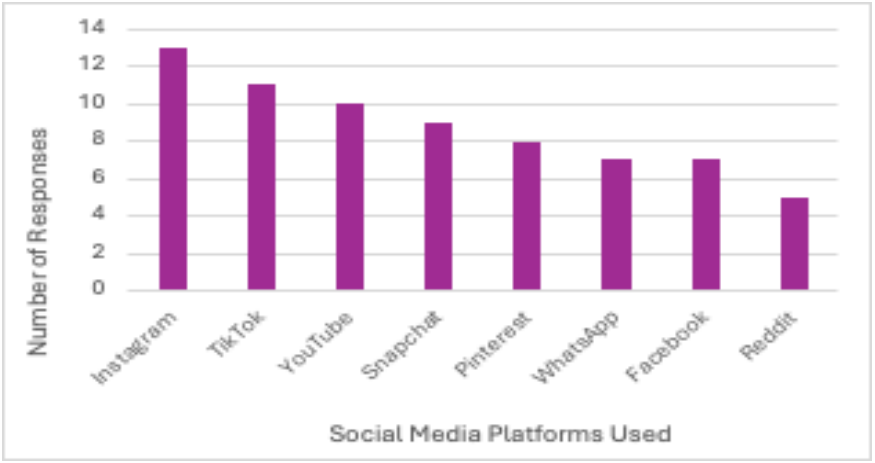
All demographic variables are reported within the results section. However, within our data analysis and tests, we did not consider how the participants program, gender identity, or ethnicity would impact social comparison, SM usage, and mental health as they lacked diversity and variability within their response choices. Thus, these factors will ultimately be excluded from the discussion section as well.

Social media: Frequencies and purpose for use

Participants were asked to identify, from a list of 16 options, which SM platforms they used most frequently in the last three months. As Figure 1 shows there were 8 platforms with the most responses of which Instagram was the overwhelmingly most popular platform with 13 participant selections (92.9%), 11 selected TikTok (78.6%), 10 selected YouTube (71.4%), 9 selected Snapchat (64.3%), 8 selected Pinterest (57.1%), WhatsApp and Facebook were both selected by 7 (50.0%), and 5 selected Reddit (35.7%). The least used SM platform was threads with 0 people selecting that platform.

Figure 1

Most Used Social Media Platforms by Participants

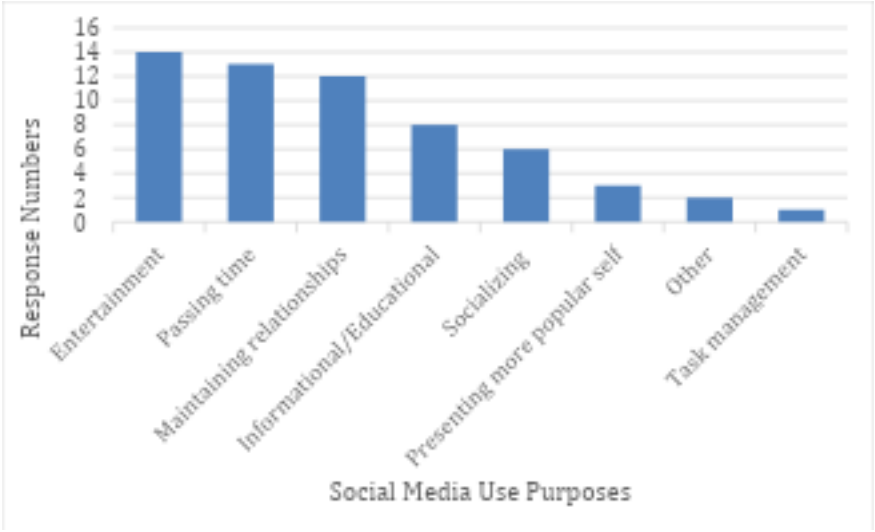


When focusing specifically on how year of study impacted the types of SM platforms used, our results indicated quite a few similarities between third- and fourth-year platform use. Both years used the 8 most used platforms identified within Figure 1. However, results also indicated some differences in third- and fourth-year platform use. Fourth year participants identified using LinkedIn (14.3%), WeChat (14.3%), VSCO (7.1%), and Discord (7.1%) whereas third years did not. Moreover, third years identified as using X (21.4%) and Tumblr (7.1%) whereas fourth year participants did not.

Participants were also asked, from a list of 8 options, what purposes they used SM for. There were 4 purposes which were overwhelmingly selected by participants. As reflected in Figure 2, 14 participants selected that they used social media for entertainment (100.0%), 13 selected passing time (92.9%), 12 selected maintaining relationships (85.7%), and 8 selected informational or educational purposes (57.1%). The least selected purposes for SM use were presenting a more popular self as selected by 3 participants (21.4%), and task management as selected by 1 participant (7.1%). Importantly, participants were given the option to fill out a "other" response option. One participant added that they use SM for "learning about new events [they could] attend" and another participant added the use of "engaging in spaces of [their] interest (fandoms)."

Figure 2

Purposes for using social media as identified by participants



We investigated how GPA impacted participants' purpose for using SM. Among A-range participants, passing time and entertainment were the most identified purposes (both 85.7%). Presenting a more popular self (21.4%), and task management (7.1%) were the least identified purposes among A-range participants. For B-range participants, maintaining relationships and entertainment were the most selected (both 14.3%). Meeting new people, presenting more popular self, task management, and educational purposes were the least identified purposes among B-range participants with zero selections.

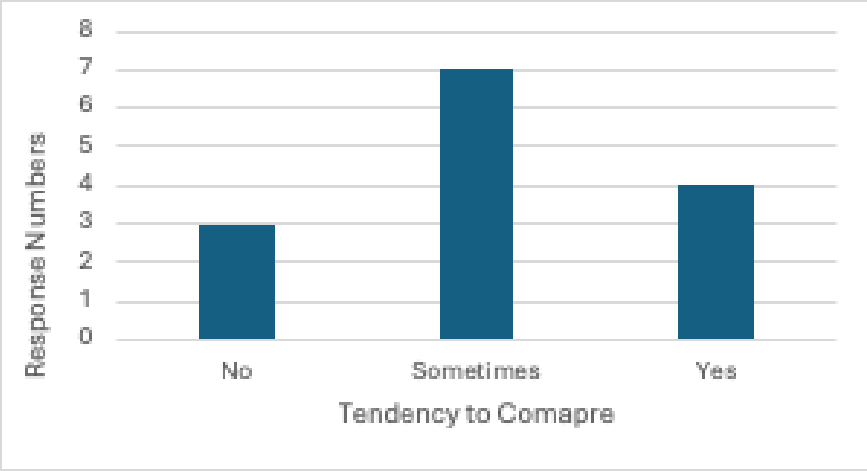
Year of study also impacted participants purpose for using SM. Third year participants used SM most for maintaining relationships, passing time, and entertainment (all 35.7%). Presenting a more popular self (14.3%), and task management (0.0%) were the least identified purposes among third year participants. Fourth year respondents used SM most for passing time and entertainment (both 42.9%). The least identified purposes among fourth year participants were task management and presenting a more popular self (both 7.1%).

Self-identified tendency to social compare

Participants were asked to self-identify if, when using SM, they tended to socially compare themselves to others. Figure 3 showcases participants responses to this question, with the majority—that being 7 participants—answering sometimes (50.0%), 4 selected yes (28.6%), and 3 selected no (21.4%).

Figure 3

Self-Identified Tendency to Socially Compare



Crosstabulations were used to examine how participants self-identified tendency to socially compare themselves differed depending on their GPA and year of study. Relating to year of study, crosstabulations revealed that third years self-identified a tendency to socially compare themselves the least (2 selected sometimes and 1 selected yes), and fourth years identified this tendency the most (3 selected sometimes, and 2 selected yes). However, as Figure 4 shows, chi-squared results revealed there was no significant difference between these years of study in their self-identified tendency to socially compare themselves x^2 (6) = 2.89, p = .822. Relating to GPA, crosstabulations revealed that A-range participants self-identified a tendency to socially compare themselves more (6 selected sometimes and 3 selected yes) than B-range participants (1 selected sometimes, and 1 selected yes). However, similar to year of study, Figure 5 shows that chi-squared results revealed there was no significant difference between the different grade ranges in their self-identified tendency to socially compare themselves x^2 (2) = .875, p = .646.

Figure 4

Year of Study Chi-Square Results

χ^2 Tests

	Value	df	p
χ^2	2.89	6	0.822
N	14		

Figure 5

Grade Range Chi-Square Results

χ^2 Tests

	Value	df	p
χ^2	0.875	2	0.646
N	14		

T-tests were run on the 5 most popular SM platforms among participants to investigate if using a particular SM platform impacted participants self-identified tendency to socially compare. There was no significant difference among those who used Instagram (*M* = 1.92, *SD* = .760) and those who did not (*M* = 2.00, *SD* = NaN) in terms of their tendency to socially compare *t*(12) = .0976, *p* = .924. Similarly, those who used TikTok (*M* = 1.91, *SD* = .701) did not significantly differ from non-users (*M* = 2.00, *SD* = 1.00) in their self-identified tendency to socially compare *t*(12) = .184, *p* = .857. YouTube users (*M* = 2.10, *SD* = .738) also did not significantly differ from non-users (*M* = 1.50, *SD* = .577) in their self-identified social comparison tendencies *t*(12) = -1.45, *p* = .174. Snapchat users (*M* = 1.89, *SD* = .782) also did not significantly differ from non-users (*M* = 2.00, *SD* = .707) in their self-identified social comparison tendencies *t*(12) = .263, *p* = .797. Lastly Pinterest users (*M* = 2.00, *SD* = .756) also did not significantly differ from non-users (*M* = 1.83, *SD* = .753) in their self-identified tendency to socially compare *t*(12) = -.409, *p* = .690.

Types of Comparisons

Participants were asked how often they compared themselves in the areas of body image, lifestyle, academics, and socioeconomic status (SES) based on a 5-point Likert scale with 1 being never and 5 being always. Figure 6 showcases participants identified types of social comparisons based on Likert scale answers. Descriptive data analysis and exploration revealed that participants most compared themselves on the aspect of body image (*M* = 3.36), then lifestyle (*M* = 3.07), then SES (*M* = 2.93), and least regarding academics (*M* = 2.50).

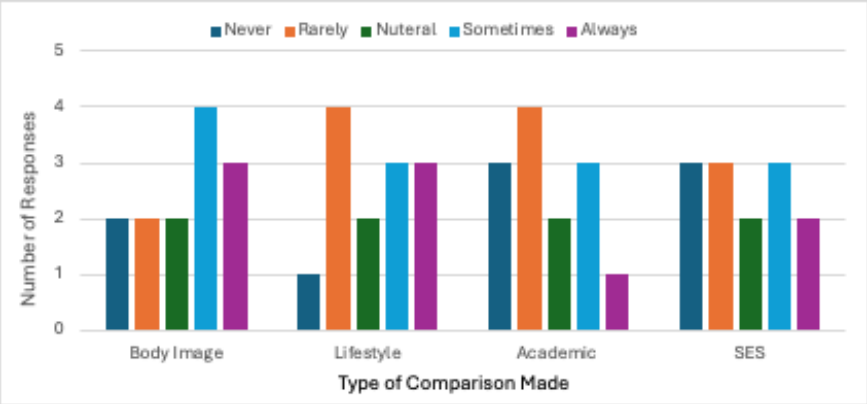
Further descriptive data analysis revealed how the aspects in which participants socially compare themselves differed based on GPA and year of study, and SM platform. When split by GPA data revealed that A-range participants compared themselves most regarding body image (*M* = 3.42) and least in academic aspects (*M* = 2.50). B-range participants compared themselves most regarding body image and lifestyle (both *M* = 3.00) and least regarding SES aspects (*M* = 2.00)

When split by year of study data revealed that level 1 participants compared themselves most regarding body image aspects (*M* = 4.50) and least regarding academic aspects (*M* = 2.50). Only one participant identified as a level 2 student and they answered ‘never’ to all aspects of social comparison. Level 3 participants most compared themselves regarding SES (*M* = 4.40) and least regarding academic aspects (*M* = 3.00). Level 4 participants most compared themselves regarding body image aspects (*M* = 3.50) and least regarding SES aspects (*M* = 1.83).

Lastly, when analyzing how users of our samples 3 most popular SM platforms differed, data revealed that those who used Instagram compared themselves most regarding body image (*M* = 3.54) and least on academic aspects (*M* = 2.62). Those who used TikTok most compared themselves on body image and SES aspects (both *M* = 3.45) and least regarding academic aspects (*M* = 2.82). While the participants who used YouTube most compared themselves on body image aspects (*M* = 3.10) and least regarding academic aspects (*M* = 2.20).

Figure 6

Identified types of social comparisons by Likert scale response choices



Body Image Comparisons

T-tests were conducted to determine how various groups differed in their body image comparisons and if these differences were significant. Regarding GPA, A-range participants did not significantly differ (M = 3.42, SD = 1.24) from B range students (M = 3.00, SD = 2.83) on body image comparisons $t(12) = .379$, $p = .712$. When analyzing year of study, results indicated that third year participants were not significantly higher in tendency to engage in body image comparisons (M = 3.20, SD = 1.789) than those in fourth year (M = 3.50, SD = .837), $t(9) = -.368$, $p = 721$.

T-tests were also conducted to determine if various SM platform users differed significantly from the non-users of those platforms. Regarding Instagram, users (M = 3.54, SD = 1.27) did not significantly differ from non-users (M= 1.00, SD = NaN) on body image comparisons $t(12) = -1.93$, $p = .077$. Regarding TikTok, users (M = 3.45, SD = 1.37) did not significantly differ from non-users (M = 3.00, SD = 1.73) on body image comparisons $t(12) = -.486$, $p = .636$. Regarding YouTube, users (M = 3.10, SD = 1.52) also did not significantly differ from non-users (M = 4.00, SD = .816) on body image comparisons $t(12) = 1.10$, $p = .292$. Figure 7 showcases these t-test results.

Figure 7

T-test results for body image comparisons relating to platform use

	Statistic	df	p
Instagram	-1.93	12	0.077
TikTok	-0.486	12	0.636
YouTube	1.10	12	0.292

Lifestyle Comparisons

When considering lifestyle comparisons, t-tests were conducted to determine how various groups differed in this kind of comparisons and if such differences were significant. Regarding GPA, A-range students did not significantly differ (M = 3.08, SD = 1.31) from B-range students (M = 3.00, SD = 2.83) on lifestyle comparisons $t(12) = .073$, $p = .943$. Regarding year of study, third year participants were not significantly higher in

tendency to engage in lifestyle comparisons (*M* = 3.20, *SD* = 1.304) than those in fourth year (*M* = 3.33, *SD* = 1.211), *t*(9) = -.176, *p* = .864.

Another set of *t*-tests determine if various SM platform users differed significantly from the non-users of that platform. Regarding Instagram, users (*M* = 3.23, *SD* = 1.36) did not significantly differ from non-users (*M* = 1.00, *SD* = NaN) on lifestyle comparisons *t*(12) = -1.58, *p* = .141. Regarding TikTok, users (*M* = 3.27, *SD* = 1.42) did not significantly differ from non-users (*M* = 2.33, *SD* = 1.53) on lifestyle comparisons *t*(12) = -1.00, *p* = .336. Regarding YouTube, users (*M* = 2.80, *SD* = 1.23) did not significantly differ from non-users (*M* = 3.75, *SD* = .946) on lifestyle comparisons *t*(12) = 1.13, *p* = .282. Figure 8 showcases these *t*-test results.

Figure 8

T-test results for lifestyle comparisons relating to platform use

	Statistic	df	p
Instagram	-1.58	12	0.141
TikTok	-1.00	12	0.336
YouTube	1.13	12	0.282

Academic Comparisons

T-tests were also conducted to determine how various groups differed in their academic comparisons and the significance of such differences. Regarding GPA, A-range students did not significantly differ (*M* = 2.50, *SD* = 1.31) from B-range students (*M* = 2.50, *SD* = 2.12) on academic comparisons *t*(12) = .000, *p* = 1.000. Regarding year of study, third year participants were not significantly higher in tendency to engage in academic comparisons (*M* = 3.00, *SD* = 1.581) than those in fourth year (*M* = 2.33, *SD* = 1.033), *t*(9) = .843, *p* = .421.

Regarding various SM platforms, *t*-tests were conducted to determine if users differed significantly from the non-users of the platforms. Regarding Instagram, users (*M* = 2.62, *SD* = 1.33) did not significantly differ from non-users (*M* = 1.00, *SD* = NaN) on academic comparisons *t*(12) = -1.17, *p* = .263. Regarding TikTok, users (*M* = 2.82, *SD* = 1.33) did not significantly differ from non-users (*M* = 1.33, *SD* = .577) on academic comparisons *t*(12) = -1.85, *p* = .090. Regarding YouTube, users (*M* = 2.20, *SD* = 1.14) did not significantly differ from non-users (*M* = 3.25, *SD* = 1.71) on academic comparisons *t*(12) = 1.36, *p* = .198. Figure 9 showcases these *t*-test results.

Figure 9

T-test results for academic comparisons relating to platform use

	Statistic	df	p
Instagram	-1.17	12	0.263
TikTok	-1.85	12	0.090

YouTube	1.36	12	0.198

Socioeconomic Status Comparisons

T-tests were also conducted to determine how various groups differed on their SES comparisons and the significance of such differences. Regarding GPA, A-range participants did not significantly differ (M = 3.08, SD = 1.44) from B range participants (M = 2.00, SD = 1.41) on SES comparisons $t(12) = .984$, $p = .344$. Regarding year of study, those in third year were significantly higher in tendency to engage in SES comparisons (M = 4.40, SD = .548) than those in fourth year (M = 1.83, SD = .753), $t(9) = 6.332$, p = <.001.

Lastly, *t*-tests were conducted to determine if various SM platform users differed significantly from the non-users of those platforms. Regarding Instagram, users (M = 3.08, SD = 1.38) did not significantly differ from non-users (M = 1.00, SD = NaN) on SES comparisons $t(12) = -1.45$, $p = .173$. Interestingly, TikTok users (M = 3.45, SD = 1.13) did significantly differ from non-users (M = 1.00, SD = 0.00) on SES comparisons $t(12) = -3.66$, $p = .003$. Regarding YouTube, users (M = 2.70, SD = 1.49) did not significantly differ from non-users (M = 3.50, SD = 1.29) on SES comparisons $t(12) = .935$, $p = .368$. Figure 10 showcases these *t*-test results.

Figure 10

T-test results for SES comparisons relating to platform use

	Statistic	df	p
Instagram	-1.45	12	0.173
TikTok	-3.66[a]	12	0.003
YouTube	0.935	12	0.368

Social Media Addiction

Participants were asked to answer the 6-item Bergen Social Media Addiction Scale (Andreassen, Torsheum, Brunborg & Pallesen, 2012). The mean scores for these items were calculated and used to run both *t*-tests and correlations for several variables. A correlation matrix determined the direction and significance of the correlations regarding SM addiction scores and the types of comparisons participants made. As Figure 11 showcases, results found that SM addiction was positively, but not significantly, correlated with body image comparison (r = 0.048, p = 0.871), lifestyle comparison (r = 0.522, p = 0.056), academic comparison (r = 0.519, p = 0.057), and SES related comparison (r= 0.243, p = 0.402).

Regarding GPA, *t*-test results indicated that A-range participants were not significantly higher (M = 2.96, SD = 1.07) than B-range participants (M = 2.50, SD = 0.236) on their SM addiction $t(12) = .58$, $p = .57$. Investigating year of study, *t*-test results indicated those in third year were not significantly higher in their SM addiction (M = 3.53, SD =.820) than those in fourth year (M = 2.69, SD = 1.113), $t(9) = 1.3948$, p =.197.

Lastly, regarding the type of SM platform used, *t*-test results indicate that those who used Instagram were not significantly higher in SM addiction (*M* = 2.94, *SD*=1.029) than those who did not use Instagram (*M* = 2.33, *SD* = NaN), *t*(12)= -0.564, *p* = .583. Regarding TikTok, users of the platform were not significantly higher in SM addiction (*M* = 2.86, *SD* = 1.069) than those who did not use TikTok (*M* = 3.00, *SD* = .882), *t*(12)= 0.201, *p* = .844. In terms of YouTube, people who used the platform were not significantly higher in SM addiction (*M* = 2.97, *SD* = .740) than those who did not use the platform (*M* = 2.71, *SD* = 1.624), *t*(12)= -0.422, *p* =.680. Figure 12 indicates these *t*-test findings relating to social media platform use.

Figure 11

Correlation Matrix Between Types of Comparisons and Social Media Addiction

		Social Media Addiction
Body Image Comparison	Pearson's r	0.048
	p-value	0.871
Lifestyle Comparison	Pearson's r	0.522
	p-value	0.056
Academic Comparison	Pearson's r	0.519
	p-value	0.057
SES Comparison	Pearson's r	0.243
	p-value	0.402

Figure 12

T-Test Results Relating to Social Media Platform and Social Media Addiction

Social Media Addiction	Statistic	*df*	*p*
Instagram	-0.564	12	0.583
TikTok	0.201	12	0.844
YouTube	-0.422	12	0.068

Everyday Mood

Participants were asked to answer Uher and Goodman's (2009) 10 item everyday mood scale. The mean scores for these 10 items were calculated and used to run both *t*-tests and correlations for several variables. A correlation matrix was used to determine the direction and significance of the correlations regarding everyday mood scores and the types of comparisons participants made. Results indicated that everyday mood was

negatively, but not significantly, correlated with body image comparisons (r = -0.335, p = 0.242), lifestyle comparisons (r = -0.080, p = 0.786), academic comparisons (r = -0.066, p = 0.822) and SES comparisons (r = 0.278, p = 0.336). Figure 13 displays these findings.

Regarding GPA, *t*-test results indicated that A-range participants were not significantly higher (M = 3.16, SD = .207) than B-range participants (M = 2.90, SD = .141) in their everyday mood scores, $t(12)$ = .1.675, p = .120. Similarly, when using a *t*-test to analyze year of study, results found that those in third year were not significantly higher in their everyday mood (M = 3.22, SD = .286) than those in fourth year (M = 3.12, SD = .147), $t(9)$ = .775, p = .458.

When considering the type of SM platform used, *t*-test results indicated that those who used Instagram were not significantly higher in their everyday mood (M = 3.13, SD = .221) than those who did not use Instagram $t(12)$= -.569, p = .580. Regarding TikTok, users were not significantly higher in their everyday mood (M = 3.11, SD = .234) than those who did not use the platform (M = 3.17, SD = .153), $t(12)$= 0.397, p =.699. Lastly, those who used YouTube were not significantly higher in their everyday mood (M = 3.13, SD = .245) than those who did not use YouTube (M = 3.10, SD = .141), $t(12)$= -0.227, p = .825. Figure 14 indicates these *t*-test findings relating to social media use.

Figure 13

Correlation Matrix Between Types of Comparisons and Everyday Mood

		Everyday Mood
Body Image Comparison	Pearson's r	-0.335
	p-value	0.242
Lifestyle Comparison	Pearson's r	-0.080
	p-value	0.786
Academic Comparison	Pearson's r	-0.066
	p-value	0.822
SES Comparison	Pearson's r	0.278
	p-value	0.336

Figure 14

T-Test Results Relating to Social Media Platform and Everyday Mood

Everyday Mood	Statistic	*df*	*p*
Instagram	-0.569	12	0.580
TikTok	0.397	12	0.699

YouTube	-0.227	12	0.825

Social Comparison

Participants were also asked to answer the 11 item Iowa-Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999)**.** The mean scores for these 11 items were calculated and used to run both *t*-tests and correlations. A correlation matrix determined the direction of the correlations and the significance in regard to social comparison scores and the types of comparisons participants made. Results indicated that social comparison scores were positively, but not significantly, correlated with body image comparisons (r = 0.531, p = 0.050)**,** lifestyle comparisons (r = 0.411, p = 0.144), academic comparisons (r = 0.212, p = 0.467), and SES comparisons (r = 0.021, p = 0.943). Figure 15 displays these findings in a correlation matrix.

Regarding GPA, *t*-test results indicated that A-range participants were not significantly higher (M = 3.52, SD = .606) from B-range participants (M = 3.05, SD = 1.22) in their social comparison scores, $t(12)$ = .906, p = .38. Similarly, when using a *t*-test to analyze year of study, results found that third year participants were not significantly higher in their social comparison scores (M = 3.58, SD = .682) then those in fourth year (M = 3.58, SD = .574), $t(9)$ = .016, p = .988.

When considering the type of SM platform used, *t*-test results indicated that Instagram users were significantly higher in their social comparison (M = 3.55, SD = .590) than those who did not use Instagram (M = 2.18, SD = NaN), $t(12)$= -2.226, p = .046. Regarding TikTok, those who used that platform were not significantly higher in their social comparison (M = 3.55, SD = .614) than those who did not use the platform (M = 3.09, SD = .909), $t(12)$= -1.038, p = .320. Lastly, YouTube users were not significantly higher in their social comparison (M=3.46, SD=.681) than non-users (M = 3.41, SD = .759), $t(12)$= -.131, p = .898. Figure 16 displays these *t*-test findings.

Figure 15

Correlation Matrix Between Types of Comparisons and Social Comparison

		Social Comparison
Body Image Comparison	Pearson's r	0.531
	p-value	0.050
Lifestyle Comparison	Pearson's r	0.411
	p-value	0.144
Academic Comparison	Pearson's r	0.212
	p-value	0.467
SES Comparison	Pearson's r	0.021
	p-value	0.943

Figure 16

T-Test Results Relating to Social Media Platform and Social Comparison

Social Comparison	Statistic	*df*	*p*
Instagram	-2.226	12	0.046
TikTok	-1.038	12	0.320
YouTube	-0.131	12	0.898

Social Media Social Comparison

Participants were asked to answer Samra, Warburton, & Collin's (2022) 8 item social media social comparison scale**.** The mean scores for these 8 items were calculated and used to run both *t*-tests and correlations. A correlation matrix determined the direction and significance of the correlations pertaining to SM social comparison scores and the types of comparisons participants made. Results of this correlation indicate that SM social comparison was significantly positively correlated with body image comparisons (r = 0.664, p = 0.013), lifestyle comparisons (r = 0.668, p = 0.013), and academic comparisons (r = 0.609, p = 0.027). SM social comparison was also positively, but not significantly, correlated with SES comparisons (r = 0.227, p = 0.457). Figure 17 displays these findings.

Regarding GPA, *t*-test results found that A-range participants were not significantly higher (M = 3.45, SD = .738) than B-range participants (M = 2.81, SD = 1.503) on their SM social comparison, $t(11) = .998$, p = .340. When investigating year of study, *t*-test results indicated that third year participants were not significantly higher in their SM social comparison (M = 3.60, SD = .793) than those in fourth year (M = 3.58, SD = .497), $t(8) = .0598$, p =.954.

When focusing on the type of SM platform used, *t*-test results indicated that Instagram users were significantly higher in SM social comparison (M = 3.49, SD = .714) than those who did not use Instagram (M = 1.75, SD = NaN), $t(11)= -2.341$, p =.039. Regarding TikTok, users were not significantly higher in SM social comparison (M = 3.53, SD = .731) than non-users (M = 2.38, SD = .884), $t(11)= -2.020$, p =.068. Lastly, YouTube users in our sample were not significantly higher in SM social comparison (M = 3.24, SD = .735) than non-users (M = 3.63, SD = 1.104), $t(11)= .760$, p = .463. Figure 18 indicates these *t*-test findings.

Figure 17

Correlation Matrix Between Types of Comparisons and Social Media Social Comparison

		Social Media Social Comparison
Body Image Comparison	Pearson's r	0.664*
	p-value	0.013

Lifestyle Comparison	Pearson's r	0.668*
	p-value	0.013
Academic Comparison	Pearson's r	0.609*
	p-value	0.027
SES Comparison	Pearson's r	0.227
	p-value	0.457

Figure 18

T-Test Results Relating to Social Media Platform and Social Media Social Comparison

Social Media Social Comparison	Statistic	*df*	*p*
Instagram	-2.341	11	0.039
TikTok	-2.020	11	0.068
YouTube	0.760	11	0.463

Qualitative Results

To gain a deeper understanding of how undergraduate students at McMaster University feel about social comparison and SM, we used 2 open-ended questions, alongside descriptive coding to identify common themes presented in the data. Out of the 14 participants, there were 9 responses to the first qualitative question. Figure 19 categorizes the frequency of various response themes pertaining to participant emotions after using SM. The five emotional themes include: 1) positive, 2) neutral, 3) negative, 4) tired, and 5) changing. Many of the students who participated, responded with feeling positive after using SM sites and networks. The second most common theme was experiencing neutral or negative moods after SM usage. The theme that was least common was feelings of tiredness and feelings of inconstancy due to the type of platform utilized. Examples of the most common response theme include:

- "I feel happy after using social media because the posts are filtered to my interests, so I mostly see and view content such as memes which make me laugh"
- "If I'm using it to unwind it generally helps me relax and take my mind off responsibilities. If I have bingeing or tracking my social media likes then I feel more tired"

Out of the 14 participants, there were 6 responses our second qualitative question. Figure 20 categorizes the frequency of various response themes pertaining to participants self-reported social comparison tendencies. There were 3 coded themes: 1) upwards social comparison, 2) general social comparison, and 3) social comparisons do

not impact oneself. The most prominent themes were upward social comparison and general social comparison. Responses that identified upward comparisons stated:

- "I only ever really compare myself to others on social factors (do they have more friends than me, are they closer to their friends than me) - partly I think because that's what I'm most insecure about . . . it's the only thing that I really deeply care about and wish that I had but don't"
- "I think I generally compare when I see someone on vacation somewhere or doing something I want to be doing rather than school for example."
- "Sometimes it's irritating to see girls on social media flaunting their wealth and privileges through posts. It does not lower my self esteem, however it annoys me that other people are ignorant towards the less wealthy."

Figure 19

Survey Question 7: In the space below, please describe your general mood after using social media sites/networks.

Themes	Responses (n=9)
1. Positive	1. 4 (44.4%)
2. Neutral	2. 3 (33.3%)
3. Negative	3. 3 (33.3%)
4. Tired	4. 2 (22.2%)
5. Emotion depends on the platform	5. 2 (22.2%)

Figure 20

Survey Question 10: Based on your responses to the question above [about types of social comparison], please feel free to share your thoughts about social comparison with others.

Themes	Responses (n=6)
1. Makes upwards social comparisons	1. 3 (50%)
2. Makes social comparisons generally	2. 3 (50%)
3. Social comparisons do not impact self-esteem	3. 2 (33.3%)

Discussion

The Impact of Social Comparison on Students' Mental Health

Throughout our study, we focused on discovering how exactly the comparisons made by students while engaging in SM use impact their mental health. Festinger's theory of social comparison helped inform our research and provided us with a framework from which we were able to build our study upon (Festinger, 1954). Our qualitative findings (Figure 20) reveal that individuals are driven to compare themselves with others, as theorized by Festinger (1954). Moreover, half of the participants who responded to our second qualitative study question indicated a tendency to make upwards social comparisons on SM. This finding offers support for Festinger's (1954)

argument that individuals in Western societies may be more inclined to upwardly compare themselves with others.

As well, we used Katz, Blumler, & Gurevitch's (1973) uses and gratifications theory to help us understand the motivations behind SM engagement, and how it may serve to reward users. Our results indicate that social media serves several needs for McMaster undergraduate students. Most notably, SM was used for entertainment, passing time, and maintaining relationships.

Anto et al., (2023) conducted a systemic literature review and a qualitative study, revealing that SM does contribute to a negative influence on mental health. More specifically, they found that the participants would claim that SM did impact their anxiety levels and considered it a significant factor in the state of their mental health and overall well-being (Anto et al., 2023). Furthermore, this study also revealed that SM would increase participants anxiety levels through inducing feelings of stress, comparisons, fear of missing out, negative experiences, and procrastination which all led to poorer mental health (Anto et al., 2023).

Our research differed from the findings of Anto et al., when assessing the association between SM, social comparison, and how it impacts students' mental health. The responses given to our first qualitative question indicated that participants typically reported having positive experiences when engaging in SM use. More specifically, quantitative data analysis and open-ended responses revealed that students predominately used SM for entertainment purposes. Additionally, qualitative responses indicated that the content they are exposed to is typically catered to their interests, thus they only view content they enjoy.

Our qualitative analysis determined that the most common comparisons made by the participants were generally related to body image, however, as qualitative responses highlight, this finding did not lead to poorer mental health or lower well-being. Moreover, when considering how time spent on social media may influence social comparison tendencies a correlation matrix revealed that SM addiction was not significantly correlated to any of our identified types of comparison. Thus, our results indicate that participants' time on social media—which would likely increase as their SM addiction score increased—does not influence their likelihood to engage in social comparisons or impact their mental health outcomes.

Therefore, within our study, although we did find that the majority of students do in fact engage in social comparison while using SM, it does not become a predictor on the status of their mental health. There could be multiple explanations for this, but one could be because students find SM to be an entertaining experience and typically encounter positive feelings when exposed to different platforms and their content.

Social Media and Social Comparison

Both the qualitative and quantitative results of this study helped to inform our understanding of how social networking sites affect the mood of students and how they compare themselves on SM. Our quantitative results concluded that the domains in which McMaster undergraduate students compared themselves include body image, lifestyle, academic achievements, and SES. Among these platforms, body image was the most identified type of comparison among participants. Additionally, our *t*-test results found that SES related comparisons were significantly higher among TikTok users, as

well as third-year McMaster students. In addition, our qualitative findings indicated that participants made comparisons in lifestyle aspects (i.e., number of friends, closeness of friends, and life circumstances) as well as SES aspects (i.e., other people's wealth and material items). Although our research aimed to uncover how students felt after using social networking sites, we were unable to establish a direct and significant relationship between the use of SM and the emotions it elicits due to the limited sample size.

We discovered that our subset of McMaster undergraduate students engages in social comparison when using SM. As indicated by our qualitative responses, the predominant style of comparison was upward. Within our specific population subset, no evidence of downward comparison when engaging with SM was found. Despite the presence of social comparison, participants reported that comparison on SM did not impact their self-esteem. This finding in our research is particularly interesting as it deviates from past research. Schmuck et al., (2019), for example, suggest that when individuals engage in upward social comparison, it correlates with a negative impact on one’s self-esteem. This inconsistency in findings offers avenues for future research to determine whether upward comparison affects one’s self-esteem.

Finally, in answering the question of which sites evoked the most comparison, we found that Instagram users engage significantly more in social comparison as opposed to those who used other SM platforms. More specifically, the predominant themes of comparison associated with Instagram use, as identified by quantitative results, are body image and lifestyle. Pedalino and Camerini’s (2022) research attempted to explain why Instagram is commonly linked to upward comparison. Their study found that the visual nature of the platform, the tendency to alter one's image through digital editing and filters, as well as the presence of unattainable influencer role models, were responsible for the increased likelihood of social comparison (Pedalino and Camerini, 2022). Despite these conclusions, our findings are limited as 93% of our participants reported using Instagram, and our sample size is small and thus difficult to generalize our data. Given these limitations, it remains unclear whether Instagram users are truly more likely to engage in comparison. Future research designed specifically to determine whether Instagram exacerbates social comparison and problematic use is needed to clarify these findings and establish a more definitive correlation between SM platforms and comparison behaviours.

Limitations

Throughout the duration of our research project, we were confronted with a few limitations. Primarily, we had to move through the process of our study relatively quickly because we were restricted by the short duration of the course. As well, the substantial preparation required before starting data collection left us with a narrow window for respondents to find and participate in our study. Unfortunately, this resulted in a low sample population, which we believe may have been one of the causes of the robustness and lack of variability and significance of our findings.

Another limitation arose from the restricted participant pool to which our research was confined. This limitation stems from the nature of an undergraduate course and the research guidelines we were required to adhere to. Consequently, we were unable to recruit from a more diverse population, which compromised our external validity. For example, we did not have any male identifying participants which prevented us from

investigating significant gender differences. We believe that this constraint impacted both the quantity of responses received and the applicability of our research. As mentioned earlier, in response to the participant limitation, our group made efforts to contact as many diverse groups as possible. However, we were met with challenges when it came to communicating with various groups around McMaster. Most of the groups that we tried to recruit participants from failed to respond to our requests, despite sending follow-up inquiries. In addition, for the group that did post a link to our study, we discovered after a week that the link was corrupt. Despite fixing the issue, a large amount of our recruitment time had already elapsed at that point. We believe that these issues, in conjunction with each other, made it difficult for us to achieve a larger sample size, with more diverse populations.

Furthermore, our project faced limitations regarding the research methodology that we selected. For instance, when using questionnaires as a form of data collection, the validity of the results may have been compromised due to participants being prone to social desirability bias. Social desirability bias can occur when individuals select answers that they assume are socially desirable, rather than selecting an option that is true to themselves. In addition, our topic of SM, social comparison, and its impact on mental health may be a sensitive topic to some demographics. Thus, we hypothesize that some participants may have felt reluctant to answer certain questions, or even engage with the study. This may have compromised the validity of our results and may not accurately represent the true experiences of our demographic. To address this, we emphasized that all participants engaging in the research would remain anonymous throughout the duration of the study.

Significant Insights

Our research has provided insight into the role that social comparison plays in SM usage, and how it may impact the well-being of McMaster University undergraduate students. Admittedly, our low sample size made it difficult to identify a great deal of significant trends in the data, thus we did not have as many insights as we had hoped. Nevertheless, our study was still able to inform our research question, as well as create a starting point for future research. Factors such as type of SM site, type of social comparison, and level of study did indicate some level of predictability on the likelihood of engaging in social comparison.

Primarily, we found that the type of social media site can influence an individual's tendency to compare oneself to others. Individuals who use Instagram were more likely to engage in social comparison on SM than those who do not use the platform. Additionally, those who used TikTok did have a significantly higher tendency to engage in SES related comparisons than non-users of the platform. Further, the level of study of our participants proved to be an indicator of the type of social comparison that a student is likely to make. Our study indicated that third year students were more likely to make comparisons with others based on SES than fourth year students.

One of our most significant insights, due to its unexpectedness, was that using social media and even engaging in some social comparisons did not result in depressed levels of mental health among the majority of our respondents. Again, while our sample size must be taken into consideration when observing these insights and results, these qualitative results still provide a unique and unexpected caveat to the literature. Future

research with larger and more diverse samples should importantly aim to confirm or reject this insight produced within our study.

While not statistically significant, our research did also produce findings consistent with previous literature. That is, similar to studies by Esiyok & Turanci, 2017; Jiotsa et al., 2021; and Scully et al., 2023, our study found body image comparisons were the predominate type of comparison participants made. Despite majority of our findings being statistically insignificant, including an analysis of certain student life variables (i.e., GPA and year of study) enabled our study to further the literature on social comparison by bridging one current gap within it. An additional gap in the literature was bridged by examining more than one SM platform in our study. However, as previously stated, future research with larger and more varied sample sizes would need to examine these components to truly understand their significance and impact.

Conclusions

Upon completing our research, we have discovered that, when undergraduate students use SM platforms, it can often lead to them engaging in social comparisons that do have an impact on their mental health and overall well-being. Throughout this study, we have analyzed the amount of time spent on different social media platforms and how students compare themselves to the content they are exposed to. Furthermore, we found that students are most often engaging in comparisons related to body image and SES while using platforms including Instagram, TikTok, and YouTube. In addition, we also discovered that overall, the participants had a more positive experience while using SM as most felt that the content they were exposed to was catered to their interests and thus enjoyable.

This study emphasizes the interplay between SM, social comparison, and the mental health of McMaster undergraduate students. Ultimately, undergraduates most used SM to be entertained, maintain relationships, and pass time. The present study sheds light on contextualizing and operationalizing theories pertaining to social media use and how it influences the mental health of undergraduates at McMaster.

Mental health can be impacted by a myriad of variables; thus, it is essential to highlight the impact of SM on mental health as the number of undergraduate students who regularly use these platforms is ever-growing (Primack et al., 2017). Moreover, it is critical that stakeholders are aware of the benefits and risks of SM usage. For example, students, post-secondary counselors, and health practitioners can learn about the impacts of SM while also discovering effective ways to manage certain emotions, be reflective, and be proactive in their SM usage.

Our study's limitations regarding sample size and diversity reflect a need for further research, with a larger, more varied sample, to further investigate our research questions. Moreover, future research is needed to examine the areas our study was unable to cover such as gender, age, program, and ethnicity differences. Overall, some of our findings within this study have contributed to, and confirmed, the existing literature regarding social media, social comparison, and mental health. However, other components of our findings such as the way SM usage impacts mental health have furthered the literature by posing interesting contradictions to the present understanding of the way mental health is impacted by SM use. Thus, it is our hope that despite a small and homogeneous sample our research has contributed to, and furthered

research on, the relationship between social media, social comparison, and the mental health of McMaster undergraduate students and given future researchers findings that can guide their inquiries.

Acknowledgments

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A Comparative Study of Student Behaviour in an Academic versus Non-Academic Environment

Tanya Kakar[1]

Abstract

Through the collection and analysis of primary research data, a non-participant observational study had been used to conduct differences in student behaviours within a non-academic environment versus an academic environment. The locations consisted of the third floor in the Mills Library and the lounge area in front of the Starbucks at the Student Success Center. This study was done to examine social norms, how they are affected in different settings, and to study major themes that emerged from the analysis of these behaviours. The methodological approaches that had been taken was conducting a non-participant observational study resulting in a covert observation of the students, along with the process of a conventional content analysis consisting of an inductive coding approach of codes, themes, and specific categories from both the observed locations. The content analysis originates from my personal observations from the study, the use of theoretical frameworks such as Erving Goffman's theory of Dramaturgy, and the data collection methods utilized such as coding, and developing categories for all the observations and themes that have been covered within the paper.

Some major themes that emerged from the research were the larger transparency for violation of norms and an increased demonstration of personal freedom within the Student Success Center as compared to the Mills Library. A violation of norms is any infringement of a normal behaviour, thus what counts as a violation is a behaviour seen as abnormal to the Student Success Centre social setting. In terms of increased personal freedom, students were able to voice out their opinions in a more casual and louder tone as well as have the freedom to choose to study, or socialize within the lounge as opposed to the Mills Library. Similarly, there were patterns of hidden behaviour and elevated pressure within the Mills Library to maintain the identity of an academic student. These themes were then examined through the lens of Goffman's theory of Dramaturgy Intensive analysis had displayed that the theatrical language used by Goffman to decipher human behaviours, such as front stage and back stage, seemed to correlate with the results of the emergent themes uncovered from the study (Khan, 2020).

The overall findings demonstrated how students put on a performance and displayed a certain persona when they were in the Mills Library, such as the performance of an academic student, known as the front stage, as compared to their other performances of being a peer and a socialized individual within other locations such as the Student Center (Khan, 2020). This theory along with the data results showed a link between students' actions and their fluid identities which relied upon the audience and setting which they were in (Khan, 2020).

Overall, the research paper further guides to inform the results and specific categorical

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themes which were derived from the study, demonstrating the link between an academic versus a non-academic setting and its behaviours which differentiated based on which environment the student was in.

Analyzing Attachment Styles within Gilmore Girls

Asal Salimi[1]

Abstract

This research paper examines attachment styles within the context of the TV show "Gilmore Girls" (Palladino, 2000-2007). Drawing on attachment theory, the study focuses on two characters, Dean Forester and Lorelai Gilmore, to examine attachment styles through the lens of attachment theory. Utilizing a qualitative approach, character interactions and behaviors are analyzed to identify patterns indicative of high anxious and high avoidant attachment styles. Dean's behaviour exemplifies anxious attachment, characterized by an intense fear of rejection and abandonment, leading to clinginess and reassurance-seeking (Bowlby, 1969). In contrast, Lorelai's interactions with her partners showcase avoidant attachment, marked by a reluctance to commit, emotional distance, and a tendency to deactivate the attachment system (Bowlby, 1969).

This paper serves as a secondary analysis, drawing on existing literature and theoretical frameworks to explore attachment styles within fictional narratives. Through this analysis, it highlights the relevance of attachment theory in understanding relationship dynamics portrayed in popular media and offers insights into fostering healthier attachments in real-life relationships. The paper argues that even though anxious people might seem overly emotional, they care a lot about relationships, while avoidant people are more detached, making it hard to form healthy connections. The paper concludes by discussing the potential for individuals with insecure attachment styles to transition towards more secure attachments and suggesting strategies for fostering healthier relationships. Ultimately, the study emphasizes the importance of understanding attachment styles for enhancing relationship dynamics.

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Associations between Culture, Biomarkers, and Medicalization in Western Society's Increasing Mental Health Crisis

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Abstract

Despite the wealth of their countries, people living in Canada and the United States report the highest rates of mental health problems in the world. How might the influence of medicalization play a role in this phenomenon? The ever-increasing mental health crisis which continues to plague North American populations reflects a desperate need to reform current treatment modalities. While the implications of treating people differently, based on non-normative behaviour or characteristics in a mixed society, poses a need to challenge our understanding of what mental illness truly is. Extending upon Dr. Mat Savelli's research from *An Introduction to Mental Health and Illness: Critical Perspectives* (Savelli, Gillet & Andrews, 2018), this paper highlights systemic limitations in the existing treatment approach through themes extracted from specific case studies providing insights into key influences contributing to this trend of increased mental illness rates. Savelli's work illustrates how a lack of biomarkers in psychiatry operationalizes a diagnostic model heavily reliant on the subjective discretions of physicians, in turn making North American populations vulnerable to practitioner bias, medicalization, and ultimately, increased rates of mental illness. Savelli then masterfully demonstrates how social construction of mental illnesses can occur through the pathologizing of perceived atypical behaviours, feelings, and diversities present within a mixed society. This is problematic since diagnostic criteria for these conditions assume healthy baseline social norms for otherwise subjective human experiences, while also lacking the biomarkers necessary to actually confirm diagnoses. Finally, Savelli highlights Western medicine's failure to accommodate the social diversities of North American populations by identifying a key discrepancy within the theoretical framework of the DSM-V: treating conceptions of mental illness and culture as binary, non-overlapping categories during the diagnostic process. As a result, individuals possessing cultural identities outside the societal norm risk being subjected to pathologized interpretations of any psychological distresses related to social injustices when accessing a healthcare system heavily influenced by the DSM-V manual.

This paper builds onto Savelli's work by utilizing his research to illustrate a bigger picture revealing an exploitative system which breeds mental illness, with medicalization serving as a vehicle to stimulate the economy rather than promote societal wellness. This piece contributes to the ongoing discourse challenging the efficacy of modern mental healthcare by advocating inclusion of a sociopsychological lens in Western medicine to optimize treatment outcomes through more personalized interventions that better recognize the subjective needs, social constructs, and cultural backgrounds of

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patients. This multidisciplinary approach refocuses existing diagnostic and treatment models toward more personalized interventions that promote mental wellness rather than merely diagnosing an issue with a view to prescribing pharmaceuticals.

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Attachment Styles and Sexual Dynamics: Exploring the Influence on Young Adults' Sexual Standards, Behaviors, and Attitudes

Emma Bourque[1], Cassandra Kahoon[1]

Abstract

Individual preferences, attitudes, personality, and sexual orientation all shape attitudes toward sexual behaviour, expressions and identity. Aside from preferences and personality, individual attachment style has been identified for its association with sexuality and/or sexual motivations (Sprecher, 2013). The purpose of this study is to examine how adults' attachment style is associated with their sexual standards, behaviours, and attitudes. Attachment styles refer to the ways individuals form connections to those in their immediate circles, stemming from early bonds established during childhood with parents or caregivers (Birnbaum, 2007). These bonds serve the evolutionary purpose of ensuring the survival, adaptation, and thriving of our species in its environment. Consequently, the attachment system, initially employed to bond with parents during childhood, extends to romantic partners in adulthood, forming our sexual preferences and attitudes in these relationships (Segovia et al., 2019). Methods used to conduct this research included online anonymous surveys. A secondary sample source of 96 women completed self-report scales tapping attachment orientations; relationship satisfaction; sex-related affect and cognitions; and sexual functioning (Sprecher, 2013). Findings indicated that (a) Attachment orientation predicts motivations for sex in casual encounters (b) Gender was found to moderate the influence of attachment style on sexuality (c) Men with a dismissive/avoidant attachment style were more sexually permissive (d) For women, a secure attachment style was associated with lower sexual permissiveness (Sprecher, 2013). In terms of limitations, findings from secondary sample studies are retrospective, therefore participants' recall of the sexual encounter could be inaccurate or biased. Additionally, it is stated that sexual satisfaction in committed relationships tends to reach a peak period (i.e., "honeymoon period") after which it decays significantly (Segovia et al., 2019). However, it is unclear whether sexual satisfaction in casual relationships shows a similar pattern. Future studies should therefore a) examine how casual relationships develop and change over time b) assess intimacy levels within each type of casual encounter and outline the factors that make the different types of casual encounters evolve into more intimate relationships; and c) examine the course of sexual satisfaction in casual relationships and how each of these differ as a function of one's attachment orientation (Sprecher, 2013).

Key Words: Attachment Style, Sexual Attitudes, Sexuality, Gender

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Examining the Relationship between Attachment Styles, Academic Performance, and Well Being among McMaster Undergraduate Students

Sara Hossein[1], Ayma Iqbal[1], Alisa Karban[1], Duygu Turkmen[1]

Abstract

Research on the implications of attachment style on well-being and academic performance among university students has grown considerably in recent years. Notably, previous literature has not evaluated how these variables interconnect with the daily lives of university students. The purpose of this study is to evaluate the relationship between attachment styles, academic performance, and mental well-being. Three research questions were developed: (1) Do explanatory styles (pessimism, optimism) predict an individual's attachment style? (2) Do attachment styles influence mental well-being? (3) Does attachment style predict academic performance? To investigate this phenomenon, MREB reviewed and approved our research proposal. An online anonymous survey was then distributed to McMaster University undergraduate students through posters and club advertising. As this project is a work in progress, data analysis has not yet been conducted. Nonetheless, the obtained data will be analyzed with thematic analysis and quantitative methods using statistical software. The findings are anticipated to contribute to the field of attachment theory by providing a deeper insight into the unique interactions of the four attributes being studied, which could help enhance McMaster undergraduate students' academic and well-being services.

Keywords: attachment styles, academic performance, mental well-being, university students

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Exploring the Connection between Social Integration and Subjective Well-being and the Impact on International Student Identity

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Abstract

The present study investigates the relationship between social integration and subjective well-being (SWB) among post-secondary students and whether international students' experiences concerning said relationship differ from domestic students. Social integration refers to individuals' degree and number of social interactions, including their level of perceived belongingness and the duration of relationships (Appau et al., 2019). SWB refers to individuals' level of satisfaction with their lives (Appau et al., 2019). Upon conducting primary research several themes emerged, which informed the development of the present study. Most notably how the relationship between social integration and SWB differs for international versus domestic students. The dominant themes emerging from current literature include social integration's association with SWB, the identity of an international student and the implications it may bring about cultural differences, and how cultural differences influence coping mechanisms, relationships, and social support systems. Firstly, results from a range of prior studies indicate that social integration is significantly positively associated with higher SWB, whereas a lack of social integration is associated with lower SWB (Awaworyi, Churchill, & Farrell 2017; Hooghe & Vanhoutte 2011; Portela, Neira, & Salinas-Jiménez 2013; as cited in Appau, at al., 2019). Secondly, international students experience social integration differently due to negative stereotypes, cultural differences and language barriers (Mak et al., 2014; Mulyono et al., 2019). Finally, cultural differences exist in international students' willingness to engage with Western institutional support resources to foster student connections because these resources can be culturally inaccessible (Coskunserce et al., 2023).

The present study focuses on a sample of post-secondary students (N=36) recruited to participate in a quantitative anonymous online survey about social integration involving closed and open-ended questions, with standardized measures for subjective well-being and satisfaction with life. The standardized scales completed by participants include the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) and the Satisfaction With Life Scale (SWLS) (Diener et al., 1985; Tennant et al., 2006). This study has been reviewed by and received ethics approval from the McMaster Research Ethics Board. We selected three theories that aptly dissect social integration's association with subjective well-being and offer an explanation as to how being an international student can

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moderate said relationship. Using Maslow's (1943) Hierarchy of Needs, Tajfel's (1979) Social Identity Theory and Goffman's (1953) Dramaturgy as interpretive theoretical lenses, we connect prominent themes from the literature such as social integration's association with subjective well-being, as well as cultural differences and coping mechanisms. We hypothesize that *H1*: International student identity moderates the positive relationship between social integration and SWB, such that international students who report a low social integration are more likely to report lower SWB than domestic students, and *H2*: International students who have not established social support systems will report greater loneliness and identity conflicts than domestic students due to cultural differences in coping mechanisms. Examining international student identity related to their ability to socially integrate and their SWB may have positive implications for updating institutional systems to help foster relationships with others more effectively. An international student's identity is a vital aspect of how they socially integrate, which ultimately affects their subjective well-being.

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Exploring Undergraduate Students' Perceptions of the Myers-Briggs Type Indicator (MBTI) at McMaster University

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Abstract

This research project aimed at collecting McMaster University undergraduate students' perceptions of the Myers-Briggs Type Indicator (MBTI) to understand the effects such perceptions have on their interpersonal and intrapersonal dynamics. Led by a team of student researchers, the research project seeks to understand the extent to which individuals use MBTI in explaining others' behaviors while exploring whether reliance on MBTI is linked to heuristics or errors. The theoretical frameworks guiding this study include Symbolic Interactionism, Labelling Theory, Social Identity Theory, and theories on stereotypes. These theories help us in examining how societal symbols, personality test results, social categorization, and stereotypes influence individuals' perceptions and behaviors in the context of MBTI. This study was reviewed and approved by the McMaster Research Ethics Board (MREB) and the methodologies of our choice employ a quantitative approach, utilizing an anonymous online survey deployed on the MREB approved platform "LimeSurvey." Targeting a sample size of approximately 57 undergraduate participants from McMaster University. The survey employs an online and anonymous format. The research finding suggests that MBTI has influences on interpersonal and intrapersonal dynamics. On the intrapersonal level, individuals are more likely to identify with their MBTI test results, to believe that the MBTI fully explains personal behavior and use MBTI memes to empathize with others. On the interpersonal level, individuals who identify with stereotypes associated with their MBTI types are more likely to embrace and relate to popular MBTI memes on the Internet describing personalities, reflecting a potential tendency to look for similar personality traits in the socialization process.

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Families Behind the Filter: How Social Media Influences Undergraduate Students' Perceptions of Parenthood

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Abstract

Social media is an influential and informational tool that has gained immense prevalence, particularly among youth and adolescents. On many social media platforms, parenthood has become a popular topic and highlights the lived experience of parents. This study explores how social media impacts undergraduate students' perceptions and attitudes towards parenthood. We seek to uncover the dominant messaging and themes surrounding parenthood on social media and explore the extent to which undergraduate students conform to online opinions. Previous research has yet to examine the relationship between social media and attitudes towards parenthood. In addition, very few studies have looked at how undergraduate students conceptualize parenthood in this digital age. We conducted an online anonymous survey via the LimeSurvey platform using both open-ended and closed-ended questions. This research is qualitative in nature as it concerns undergraduate students' experiences on social media and their personal views and opinions. This is an ongoing research study, but has been reviewed and approved by the McMaster Research Ethics Board. We anticipate gaining significant insight into how undergraduate students view and prioritize parenthood in their lives. Using social comparison theory and social learning theory, we will analyze social media habits in relation to attitudes towards parenthood. Our findings will allow us to compare current perceptions of parenthood to traditional and conservative attitudes that are historically accurate. In addition, we predict that undergraduate students' attitudes towards parenthood will reflect the global trends of postponing parenthood and declining birth rates. Overall, our study may emphasize the role that social media plays in our everyday lives and the impact it can have on our life choices and personal attitudes.

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Police Experiences: Navigating Hypervisibility and Critique

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Abstract

Increasing levels of surveillance and public visibility have had a significant impact on police perceptions of themselves, their peers, and their rights and duties as officers. Through this ethnography, five current and retired police officers affiliated with the same department were interviewed using a semi-structured approach. Officers discuss the public's changing perception of police, their values, the gendered nature of their workplace, and differences between older and newer generations. Responses were analysed through the frameworks of both symbolic interactionism and dissonance theory to give insight into how officers come to define and negotiate their surroundings. Notable themes highlighted throughout the interviews were the wavering legitimacy of officers in management roles, performative masculinity, and workplace burnout.

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White School: Examining the intersection of Racism and Ableism in Western Education

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Abstract

Targeting populations affected by the intersection of racism and ableism in Western Education, Fraser and Caka present a literature review of six case studies, traversing from the inner-city struggles of four special education students in the fifth grade to the silence of teacher candidates in several Western United States preschool classrooms. The resounding research question: What are the effects of racism and ableism on the Western education system and the people who interact with it? Fraser and Caka found it challenging to find qualitative studies centring on these two intersections in Canadian literature, exposing an imperative obligation for Canadian academia to examine biases around education, who it serves and who it leaves behind. Caka and Fraser reviewed five qualitative reports from the USA and one from the UK. Two reports from the USA examined graduate students in early education and special education. Graduate students in special education grappled with their revealed implicit bias after taking the Implicit Association Test, doubting the accuracy of the test. Teacher candidates in preschool classrooms exhibited an inability to facilitate in-depth dialogue on these challenging subjects even when opportunities were expressly given to do so. Two reports interviewed students on their experiences as racialized learners in special education in the United States. One paper was written by Emily and Zhey, two American graduate students', retelling their intersectional journey facing racism and laissez-faire ableism. A prominent example of this is Zhey's experience of PTSD after a terrorist attack on their hometown during their post-grad education. While the accessibility accommodations were in place, the pressure and stigma from Zhey's professors prevented them from using those accommodations to stay home from class to recover. One final article explored the experiences of Pakistani heritage parents spotlighting cultural challenges within the Special Educational Needs and Disability (SEND) landscape, where power differentials and professionals' lack of cultural understanding led to distrust from Pakistani parents, making it harder for them to access resources. Systemic flaws echo distressing realities for marginalized communities. This exploration exposes systemic failures, advocating for transformative change to dismantle discriminatory practices, foster diversity, and ensure equitable participation, thus aligning with the imperative pursuit of educational equity and justice.

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