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The Future of Work, Physical Location of Workers, Technological Issues and Implications

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Abstract

The 2019 Pandemic drastically changed many aspects of work including where and how the work gets done. Many individuals and organizations modified their work location and how they accomplish various tasks relying a lot more on information and communication technologies than ever before. As the pandemic eased, organizations and individuals revisited the nature and location of work. Based on what we have seen so far and the published literature, it is likely that the future of work for many workers is different than before the pandemic. Rapid technological innovations and adoption of Generative Artificial Intelligence (GAI) types of platforms are also having major impacts on how some tasks will be performed. In this editorial, based on our literature review, personal experience and observations, we will describe what we expect to see for the foreseeable future. We will also address implications of our findings for institutions of higher education.

Keywords: In office, remote, hybrid work, Generative Artificial Intelligence (GAI) impacts on future of work, implications for higher education.

1. Introduction

The 2019 Pandemic drastically changed many aspects of work including where and how the work gets done. Many individuals and organizations modified their work location and how they accomplish various tasks relying a lot more on information and communication technologies than ever before. The concept of "Virtual Organization" (Burkhard and Horan, 2006, p. 239) is not new and researchers have been predicting it for more than a few decades. As the pandemic has eased, organizations and individuals are revisiting the nature of work and the concept of hybrid work.

Townsend et al., 2002, among others, stated that more widely availability of information and communication technologies facilitate the transformation of organizations to what AACSB 2002 report referred to as "conducting business activity anytime, anywhere" (p. 240). In addition to the historical transformation of work, new technological innovations such as the use of GAI are impacting how, and where tasks are accomplished.

Based on what we are already observing in most organizations, the question we need to ask is what are the implications of the changes for employees, organizations, customers, communities, and society as a whole regarding the future of work. If you ask employees, they very much request flexibility. In particular, those who have younger children, other family members they need to provide care for, or disabilities that make in-person work challenging may prefer the flexibility afforded by remote work arrangements. The other major consideration is the potential implications for the lack of or limited social interaction. It is true that there are many communication technologies available; however, as we know, there are some needs for in-person meetings, in particular, for newer members of our organizations.

From the organizations' point of view, functions, services, products, etc. need to be delivered in a timely fashion. These requirements, to some extent, are also expected from customers. Implications for communities and society as a whole are much broader. For example, we may consider housing, office space, and transportation systems and requirements. As we experienced, at the onset of the pandemic, many individuals moved to different cities and states than their employment location. Major cities saw significant decline in office occupancy that is still not back to pre-pandemic levels. Commuting time and congestion, particularly in larger cities, is also a factor to consider for longer term planning. Of course, as far as society as a whole is concerned, energy consumption and sustainability issues come to mind as well when thinking about longer-term implications of daily commuting to work and office occupancy levels.

Artificial Intelligence (AI) has been around for quite some time and has been making a positive impact on our lives in many different ways. We use this technology in our homes for monitoring and security, controlling and adjusting temperature, improving sanitization, buying products, monitoring our health, entertainment, and education. Similarly, businesses and other organizations have been using AI and related technologies for many years in various areas including manufacturing. During and after the pandemic, many businesses and other organizations significantly increased their focus on using enhanced versions of AI technology such as GAI to perform different organizational functions. Some publications (Balakrishnan et al. 2020) estimated that in 2020, more than 50% of businesses were implementing some kind of generative AI technologies. The adoption rate has been growing exponentially. It is apparent that GAI will have a transformative impact on how work gets done in all kinds of organizations. In the next section, we conduct a brief review of the literature related to future of work and GAI incorporations in organizations.

2. Literature Review

Based on what we have seen so far and as our literature review indicates, it is likely that the future of work for many workers is different than before the pandemic. Garzillo, Cioffi, Carta, and Monaco (2022) reviewed 2,477 articles and conducted detailed analysis of 51 of them to determine the trends. They focused on three important characteristics of the future of work and its implications for individuals and organizations. Namely, "remodeling of work organizations," "clinical evaluation of workers." and "testing strategies related to return to work" (p. 1). For the first characteristic, their literature review indicates that different organizations have developed alternative models for return to work based on the risk level employees are willing to take. They suggest adopting "flexible

working modalities." Regarding the clinical implications, the authors suggest "fitness for work" evaluation is essential. For the "testing strategies" the authors suggest various ways of health surveillance to be implemented.

Barath and Schmidt (2022) conducted an online survey of fifty employers including major private and public organizations in two countries – Slovakia and Kuwait - to determine their vision of flexible office space after the pandemic and return of employees to work. Their focus was to determine how future work will be "planned, organized, performed, and controlled" (p. 1). Based on their analysis and findings they suggest that options for future office arrangement could include "open office, coworking office, satellite center, activity-based office, home office, and other remote" (p. 12).

Kong, Zhang, Xiao, Das, & Zhang (2022) used open-source survey data to determine the extent that companies have accepted the work from home practice. As a part of this study the authors looked at literature regarding the "travel behavior, work from home characteristics, and societal implications" (p. 1119). This study concludes that the work from home has become a new normal for many employees. However, they also found that some employees are still struggling with the practice of work from home. Data analysis of this study suggest that employees who had some work from home experience prior to the pandemic are more accepting to continue working from home compared to employees who did not have this experience. This study further suggests that flexibility should be a major consideration by employers. They also suggest that some professional training may be helpful for employees who do not have much work from home experience.

Durakovic, Aznavoorian, & Candido (2023) conducted an online survey of 668 managers and 911 knowledge workers from 12 different industries in Australia. The focus of the study was on "perceived effectiveness and performance, sense of adjustment to remote working, and sense of belonging" (p. 1) during the first two COVID-related lockdowns in Australia. Employees who responded to the survey stated that they were technically supported, were productive working remotely, but their sense of "connection and belonging was suffered" (p. 1). They further stated that the main reason to come back to the office is to be with colleagues and be able to better collaborate with them. This study also found that managers want "efficacy in managing their teams, workflows, and professional purpose" (p. 23). They recommend creating an "effective hybrid work place post pandemic" (p. 23).

Baudot & Kelly (2020) conducted a survey of 592 US workers who were living and working from home using Amazon MTurk. The survey focused on finding the employees' as well as their subordinates' perception of work productivity during the COVID shutdown. This study's preliminary finding indicates that a) the respondent's perception is that their productivity improved, b) the perception of improved productivity is positively corelated with the amount of work done remotely prior to the COVID, and c) if given the option of remote work after COVID, workers would prefer to do so.

Based on our literature review and personal observations over the last three years, it seems that for many organizations the future of work is a hybrid arrangement. In the next section we identify some benefits and potential pitfalls of the hybrid work environment.

3. Potential Benefits and Pitfalls of the Hybrid Work Environment

The most apparent benefit of the hybrid work is the flexibility and autonomy it provides for employees. It is particularly family-friendly for individuals with younger children or families who need to provide care for elderly family members. Individuals with disabilities that make in-person work challenging may be more productive or more able to participate in the labor force when hybrid or remote options are available. The travel time saving associated with the hybrid work could also potentially increase productivity. It could reduce traffic congestion and in the longer term potentially impact climate change and improve sustainability. Organizations that are looking for new employees can use the hybrid work option benefits to increase the pool of candidates. Space costs saving could be significant for organizations by utilizing the well-established hoteling office space practice.

We need to be aware of and prevent or at least minimize potential negative aspects of hybrid work in

organizations. Long-term isolation and the lack of ability to socialize and collaborate is not healthy. Newer employees need interaction and face-to-face team building, networking, and informal training opportunities. Fortunately, with proper safeguards in place, these potential negative implications of hybrid work can be fully eliminated or, at least, significantly reduced.

In general, all employers want accountability from employees. Organizations that adopt the hybrid work environment need to consider developing and broadly circulating policies and requirements for hybrid work. Such guidelines should specifically state the minimum number of days and hours that employees are expected to work on site. Some employees and supervisors may need specific training to be effective and productive in this new work environment. State-of-the-art and best practices other organizations are using for hybrid work can be presented during these trainings.

Another consideration is the fact that many organizations are automating routine processes using GAI so the presence of some staff members at all times may not be needed in the office. Some employees can be upgraded to perform higher level tasks when their previous tasks are automated. This process has been expedited more recently with the wide availability of GAI-based platforms.

4. Potential Implications of Hybrid Work and GAI for Higher Education

The implications of hybrid work for higher education institutions are somewhat similar. Given that our highest priority is to find ways to best meet our learners' demand, we will need to make sure a variety of course delivery modes are available for students to select from based on their learning preferences, time constraints, and location constraints. A good number of students are now experienced with taking online, hybrid, and HyFlex courses and many faculty members have developed more expertise in offering courses in various delivery modes. This situation allows faculty, staff, and administrators to adapt to a hybrid work environment. It is important to recognize the fact that some students as well as faculty members in some disciplines, such as accounting, still prefer face-to-face instruction due to the nature of the courses' contents. The hybrid work environment will allow multi-mode course delivery.

Universities faced with declining enrollments may also benefit from considering ways in which course modality options may allow them to attract and retain new types of students such as students with inflexible work schedules and challenging family care responsibilities. We also recommend that universities consider their missions in the context of the ways in which course modality options and work arrangements may allow them to serve their stakeholders. For example, regional public universities with students, faculty, and staff with lengthy commutes may benefit from offering online and hybrid courses and remote work arrangements, while more residential universities may benefit from a more traditional approach of mostly in-person work and classes.

Another important consideration is to provide means for students, faculty, and staff to interact and network with peers and mentors. Although there are many communication technologies available for interaction, it is essential to provide ways for students to experience socialization and networking, in particular, for undergraduate students. Group projects and presentations either in person or via video conferencing is one way to facilitate this process.

The availability of GAI-based platforms could potentially facilitate more effective hybrid work environment at the institutions of higher education. Similar to other organizations, the routine tasks such as recruiting, hiring, retention, on and off-boarding, routine admission enquiries and other processes, can be effectively automated. This automation process could ease the need for staff to be present at the office so it facilitates the hybrid work environment.

There is an urgent need for institutions of higher education to develop policies and guidelines for adoption and implementation of hybrid work environment as well as ethical uses of GAI-based platforms in teaching, learning, and scholarship. We should not simply ban GAI related technologies due to the concerns that some individuals will use them unethically. History is repeating itself. We have seen similar arguments when other technologies such as the Internet and the Web came about. Some feared that plagiarism would destroy the quality and value of higher education. This did not happen and it will not happen with new AI-based technologies either.

Given the fact that many organizations that hire our graduates have already adopted GAI-based platforms in their operations, we need to design our curricula such that our graduates are exposed to the ethical uses of GAI-based platforms. These technologies can be used to enhance our students learning and engagements. They can also be used to better design assignments and assess students' performance more accurately. In many parts of the Midwest USA and the rest of the country, equity gaps exist in the level of education students have before entering college and during their college years. We need to identify ethical ways to fill the gaps so that all students regardless of their social and economic background gain the same level of education and access to new educational tools and technologies.

5. Conclusion

Organizations including institutions of higher education that have made a decision to continue with the hybrid work environment will benefit operationally if they articulate and communicate their hybrid model and clearly state the guiding operational principles. The guidelines should consider the benefits of hybrid work, including the flexibility, and autonomy it provides, but also the potential challenges it may create, in particular, for newer employees. The guidelines for hybrid workforce could, for example, include:

- The organization needs to meet and exceed the expectations of their customers as well as management.
- All employees whose functions can be conducted in a hybrid mode should be treated equally.
- The organization needs to make sure to facilitate the creation of an environment for all employees and, in particular, new employees the ability to interact face-to-face as needed.

Similarly, for institutions of higher education guidelines for hybrid work and the use of GAI-based platforms could, for example include:

- When it comes to the hybrid work option, all employees, with some exceptions such as security personnel, should be treated equally.
- As far as possible, departments within an institution should articulate similar guidelines and principles for work arrangements. Employee dissatisfaction is likely to increase if some departments allow more flexibility than others or if some managers insist that all meetings occur in-person while others encourage remote meetings. In general, rigid regulations of time and location will need to be carefully justified and clearly communicated in order to maintain adequate levels of employee satisfaction and retention.
- Safeguards need to be in place to make sure that adequate in-person interaction options are available for socialization and networking with peers.
- Specific guidelines need to be developed for students, faculty, and staff for the use of GAI-based platforms. University policy regarding plagiarism and its consequences with respect to the use of GAI need to be clearly articulated for all students and every employee in the institution.
- Equal access to GAI-based platforms should be provided for all students and employees for ethical uses of these platforms.

6. Overview of the Contents of this issue

This issue of the journal includes two traditional research articles. Qinhui Wang, Andy Luse, and Julie Rursch in their interesting and timely article looked at enrollment in information technology and the available IT related jobs. Using the social cognitive career theory (SCCT) they followed high school students for two years to better understand the decision-making process students use to select IT related jobs for their future career.

Christine Witt, James Melton, and Robert E. Miller in their important article looked at the social media postings of students and how they can potentially negatively impact students during and after college.

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The Longitudinal Impact of IT Self-Efficacy and Interest on Intent to Major

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Abstract

Although enrollment in information technology has increased, it cannot match the growth of the IT labor market with more students needed to enter into the IT field to fulfill demand. This research follows high school students for two years regarding the choice of IT as a college major using the lens of social cognitive career theory (SCCT) to better understand career decision-making over time. Self-efficacy, interest, and intent to major relationships are examined both cross-sectionally and longitudinally. Findings show that IT self-efficacy has a significant positive effect on interest and intent to major respectively and interest in IT has a significant positive effect on intent to major in IT. These are consistent with previous research in SCCT. Contrarily, only IT self-efficacy increases over time, while intent to major decreases during this same two-year time period.

Keywords: social cognitive career theory, longitudinal, career choice

Please note: A previous version of this article received one of the best paper awards at the 2023 Midwest Association for Information Systems (MWAIS) held at Metro State University in May 2023. The article has been expanded and was subject to a second round of reviews. We congratulate the authors.

1. Introduction

Recently science, technology, engineering, and math (STEM) programs in colleges and universities often have low student enrollment, high attrition rates (Forney, 2020; Sithole et al., 2017), and in turn low retention rates (Lytle & Shin, 2020). With the rapid development of the tech industry, the situation has exacerbated the shortage of qualified labor. Reports show that the United States of America needs to fill the demand for 3.5 million STEM jobs by 2025 (Cullins, 2022; Lazio & Jr, 2019). This high demand has become a national concern to the point that outreach programs have been designed to attract more students into STEM studies (Makransky, Petersen, & Klingenberg, 2020). The purpose of this study is to utilize one such program to investigate the reasons high school students choose IT as their major utilizing a year-long program to increase interest in IT.

Social Cognitive Career Theory (SCCT) explores career development to understand how to influence occupational interests and choices (Lent, Brown, & Hackett, 2000) through reciprocal links among individual attitudes, environment, and behaviors (Lent, Brown, & Hackett, 1994). While a useful model, most previous research uses students who are already in the STEM field (such as college students) with the majority of this research testing the SCCT model cross-sectionally (Burga, Leblanc, & Rezania, 2020; Heinze & Hu, 2017; Navarro, Flores, & Worthington, 2007). Even though some research focuses on longitudinal impacts, the time is a short period, such as one year or less (Rogers & Creed, 2011). This study extends previous research by not only testing SCCT cross-sectionally, but also brings a greater understanding of the longitudinal impacts within intervention programs designed to influence individual career development. Furthermore, our research utilizes a sample of high school students who have yet to make decisions about their study area. Our research questions are:

1) What factors impact major choice in IT prior to career development (cross-sectionally)?
2) How do these factors influence these individuals over time as they gain more IT-related experience?

This research focuses on measuring the impact of IT interest and self-efficacy on individual intent to choose a major in IT by utilizing the SCCT model and examining these core concepts over time with 43 students across 40 different high schools for two years. Results reveal that initial cross-sectional relationships are consistent with previous research (Flores & O'Brien, 2002; Heinze & Hu, 2017; Rottinghaus, Larson, & Borgen, 2003). Longitudinally, we find that self-efficacy increases but interest does not. Interestingly, the intent to major decreases over this same two-year period. This study contributes to the application of SCCT in the IT domain for longitudinal impacts in early career development.

2. Background

Social cognitive career theory (SCCT) is used to understand how people choose their careers and predict career behavior (Lent et al., 1994). This theory is developed from Bandura's general social cognitive theory (Bandura, 1986) which stresses the dynamic and triadic interactions of individual, behavioral, and environmental factors (Heinze & Hu, 2017; Lent et al., 1994; Lent, Lopez Jr, Lopez, & Sheu, 2008; Luse, Rursch, & Jacobson, 2014). Individual factors represent personal cognitive and emotional states, environmental factors indicate the external environment, and behavioral factors indicate overt behavior, with the three factors having reciprocal effects on one another (Bandura, 1986; Lent et al., 1994). In SCCT, the behavior (outcome variable) is regarded as the individual's choice of major or career while the individual and environmental factors can influence the whole process (Rursch & Luse, 2019). Accordingly, we believe that students have the ability to control their own personal behavior and meanwhile external environmental and internal psychological factors are likely to support or undermine this ability in career development (Lent et al., 1994; Luse et al., 2014).

Depending on various outcomes, SCCT contains three interconnected models: 1) interest model, 2) choice model, and 3) performance model (Lent & Brown, 2019; Lent, 2000). The interest model investigates how academic and professional interests emerge, looking at characteristics of the family, educational, recreational, and peer contexts and how they affect interest in a particular career field. Intention is the outcome variable in the interest model. Moreover, the choice model addresses how individuals form their educational and career choices, with choice goals as the outcome. Furthermore, the performance model explains accomplishments connected to chosen or adopted goals, with performance goals as the outcome (Lent et al., 1994). In particular, we focus on the choice model rather than the other two for several reasons. First, the interest model is built upon the choice model and the two models overlap in their core concepts (Lent & Brown, 2019; Lent et al., 2008). Moreover, this research emphasizes that students intend to choose a major for their undergraduate programs in the future. Therefore, we use the choice model of SCCT to scrutinize how individual predictors influence intent to major.

SCCT implies two individual-level predictors of individual interest and self-efficacy beliefs, which might impact individual intention to major in a certain area (Rursch & Luse, 2019). Individual interest represents whether individuals

like or dislike certain activities (Rursch & Luse, 2019). SCCT assumes that individuals are likely to be attracted to distinct activity niches within a wider sector in part due to their personal interests (Lent & Brown, 2006). Students are more likely to succeed in subjects they enjoy studying as well as seek jobs in those areas (Mohd Shahali, Halim, Rasul, Osman, & Mohamad Arsad, 2018). In addition, self-efficacy beliefs encompass judgments of individual capabilities to organize and execute courses of action to attain specific outcomes (Bandura, 1986). Self-efficacy is considered to directly affect individuals' thoughts, activities, and choices (Lent et al., 1994) since individuals can successfully complete their tasks when believing they have enough skills and ability to conduct them (Rursch & Luse, 2019). Moreover, self-efficacy can be measured using both general and task-specific methods. The program in this study provides different kinds of tasks in certain areas, necessitating task-specific self-efficacy measures.

Intention to choose in SCCT is impacted by not only the two personal factors of interest and self-efficacy but also the environment. Environmental factors represent "the temporal and spatial forces beyond an individual's boundaries". A supportive environment for students contains various resources that can allow students to explore a certain area. For example, an environment with enough teachers and abundant educational materials can let students learn very conveniently. Some research introduces intervention programs to enhance the possibility of attracting students into STEM areas for their future careers (Ball, Huang, Cotten, Rikard, & Coleman, 2016; Betz & Schifano, 2000). By providing mentors, such as faculty or program leaders, to students involved in these intervention programs, they are encouraged to pursue advanced training and careers (Byars-Winston & Rogers, 2019). This research utilizes one such intervention program as a supportive environment to train and attract students into pursuing STEM areas.

This research focuses on a specific area - IT, with the tenets of SCCT specific to this context. IT self-efficacy refers to a belief that individuals have the ability to perform a specific IT task successfully (Bandura, 1986; Luse et al., 2014; Scheibe, Mennecke, & Luse, 2007). Interest in IT represents that people enjoy IT activities or subjects (Luse et al., 2014). Intent to major is when students intend to perform some action (Lent et al., 2015), such as choosing IT as their major (Rursch & Luse, 2019).

Based on previous research, SCCT has been used to measure career aspirations using cross-sectional studies (Lent et al., 2015; Rursch & Luse, 2019). Individuals with higher self-efficacy are likely to develop interests in IT (Lent & Brown, 2019). Since they believe they are good at the tasks in an area and have good performance in each activity, they are more likely to have interest in pursuing or choosing to do these same tasks. In empirical studies, self-efficacy is found to have a positive relationship with interest (Flores & O'Brien, 2002; Krieger, 2022; Lent & Brown, 2019; Rottinghaus et al., 2003; Smith, 2002) and intention to choose IT as a major (Heinze & Hu, 2017; Navarro et al., 2007).

In addition, interest is seen as a strong predictor of choice of future career goals (Brown & Brooks, 1990). Interest is found to have a positive impact on the intention to choose IT (Asli Yagmur Akbulut, 2008; Zhang, 2007). When students enjoy doing IT tasks, they are more likely to intend to choose IT for their future career. Given this information, we hypothesize:

Hypothesis 1: Initial IT self-efficacy will positively influence the initial level of interest in IT.
Hypothesis 2: Initial IT self-efficacy will positively influence the initial level of intent to major.
Hypothesis 3: Initial interest in IT will positively influence the initial level of intent to major.

Although most previous research has focused on a one-time impact, SCCT also emphasizes a dynamic process over time – how a focal individual makes a decision (behavior) from the interaction between personal predictors and the supported environment, and how the subsequent behavior impacts these two forces (Clary, Dick, Yagmur Akbulut, & Van Slyke, 2022; Lent et al., 1994; Lent et al., 2000). Specifically, we are interested in the context of intervention programs as an external environmental force. The three core concepts of SCCT, self-efficacy, interest, and intent to major, might change over time during these intervention programs. Self-efficacy is relatively dynamic in particular activity domains (Lent et al., 1994; Lent et al., 2005) with individual beliefs changing dependent on performance (Burga et al., 2020; Lent et al., 1994; Valcour & Ladge, 2008). Particularly, self-efficacy can vary remarkably based on a certain activity or domain (Lent & Brown, 2006; Luse & Rursch, 2021). When students have more experience in IT through an educational program and are good at IT tasks or projects, their IT self-efficacy is likely to increase due to an increase in confidence of performing IT tasks (Lent & Brown, 2006; Luse, Mennecke, & Triplett, 2013).

Interest is dynamic as more positive experience with IT leads to greater interest (Brown & Brooks, 1990; Smith, 2002). When enjoying studying IT during educational programs, individuals are more interested in IT. Additionally, students having more experience in the program might intend to choose to pursue a career in that area (Belchior & Lyons, 2021; Lent et al., 2015). For example, students with strong coding skills might choose information systems as their major in college. Given this information, we hypothesize:

Hypothesis 4: As students gain more experience in IT, they will show an increase in IT self-efficacy.
Hypothesis 5: As students gain more experience in IT, they will show an increase in interest in IT.
Hypothesis 6: As students gain more experience in IT, they will show an increase in intention to major in IT.

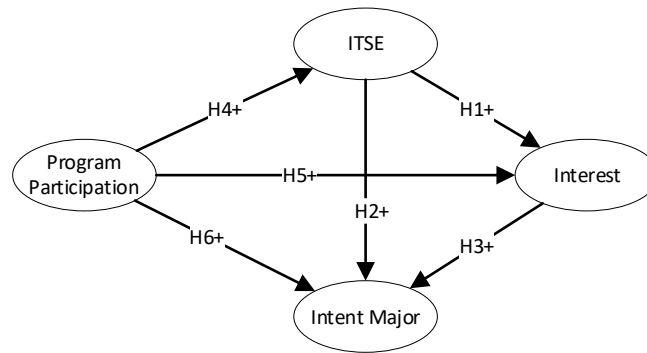Figure 1 shows the research model with the proposed hypotheses.

Figure 1. Research model

3. Data collection

The research consisted of a field study of participants in the outreach program. A field study is used to observe and interact with subjects in a natural environment and in real life with less control while an experimental study is conducted in a laboratory environment under controlled conditions (Heppner, Wampold, & Kivlighan, 2008). In our case, we did not consider using a control group which does not allow all students to have equal access to the educational content. The students in the control group could not benefit from the program until finishing this study; therefore, a field study is appropriate for our case and pedagogic purpose.

Subjects in this study signed up for an IT outreach program that allows students to explore IT areas and to increase interest in IT majors. The program contained educational programming, service-learning projects, and competitive events in the areas of cyber defense, game design, and robotics as outlined in previous research (Rursch, Luse, & Jacobson, 2009). Since this program targeted high school students across a Midwestern state, IT clubs in high schools played an important role in letting local students know and engage in this program. The IT clubs provided classes with educational materials and equipment, mentors, and transportation to the final competitive event for students, coined the IT Olympics. Although it was difficult to provide a complete gamut of IT information, the program supplied enough material that allowed students to conduct their own in-depth and inquiry-based approach to overcome a specific IT challenge during learning. Overall, the program provided a supporting environment to enhance understanding and enthusiasm for IT and increase enrollment in IT-related post-secondary education to address future needs in the IT industry.

Most participants had little experience in IT before taking part in the program. The students were encouraged to learn all three areas (cyber defense, game design, and robotics), but some chose one area to explore. During the program, students not only went to their IT clubs to learn about various IT concepts, but also could participate in year-ending IT Olympics competition related to one of the three areas (Rursch et al., 2009). More detailed information about the area design and concepts taught is provided in the Appendix. The program has been running since 2008, and we collected data from 2008 up until the pandemic. We sent emails with online surveys to students both in the fall, after initial enrollment in the program, and spring, after the conclusion of the program. The purpose of this study was to assess the multi-year impact of those who participated in the program multiple years. Over a two-year period, students were surveyed four separate times, at the beginning and end of each academic year, as seen in Figure 2.
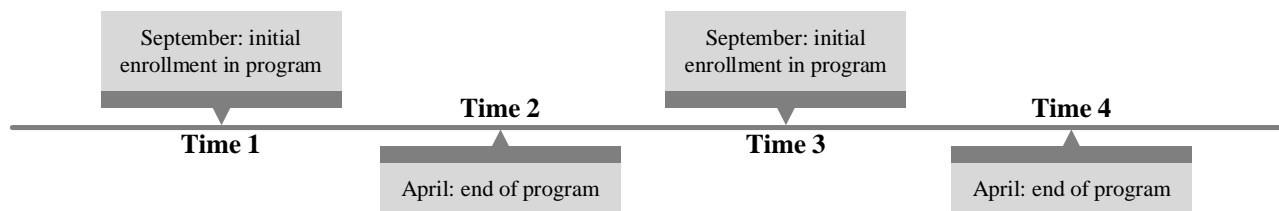

Figure 2. data collecting processing.

4. Results

The sample consisted of 43 students measured at four separate time points, totaling 172 measurements. The sample consisted of six female and 37 male participants. Questions measuring the three constructs of IT self-efficacy, interest in IT, and intent to major in IT were utilized from previous research (Luse et al., 2014) based on best practices of task-based assessment (Davazdahemami, Luse, Scheibe, & Townsend, 2018) (see Appendix for questions). Cronbach alpha values at all four measurement times were found to be high for both ITSE (0.89, 0.85, 0.85, 0.84) and interest (0.86, 0.82, 0.84, 0.88), with intent to major in IT measured using a single item. Gender and year in school were also included as control variables.

Growth curve modeling was used to test the hypotheses, allowing examination of both the cross-sectional impact of the exogenous variables on the endogenous variables (H1-H3), and the longitudinal change of each variable over time (H4-H6) (Luse et al., 2013). Results show that the initial level of ITSE has a significant positive effect on the initial level of interest ($\beta = 0.48$, $p < 0.001$), supporting H1. The initial level of ITSE also has a significant positive effect on intent to major ($\beta = 0.28$, $p = 0.033$), supporting H2. Furthermore, the initial level of interest has a significant positive effect on intent to major ($\beta = 0.64$, $p < 0.001$), supporting H3. Examining the longitudinal relationships, there is a significant increase in ITSE over time (mean = 0.64, $p = 0.031$), supporting H4. Conversely, there is no significant increase in interest over time (mean = -0.47, $p = 0.534$), not supporting H5. While there is a significant change in intent to major over time (mean = -0.63, $p = 0.040$), the change is decreasing, contrary to H6. Figure 2 shows the mean trajectories of each of the three variables over each of the four time points.
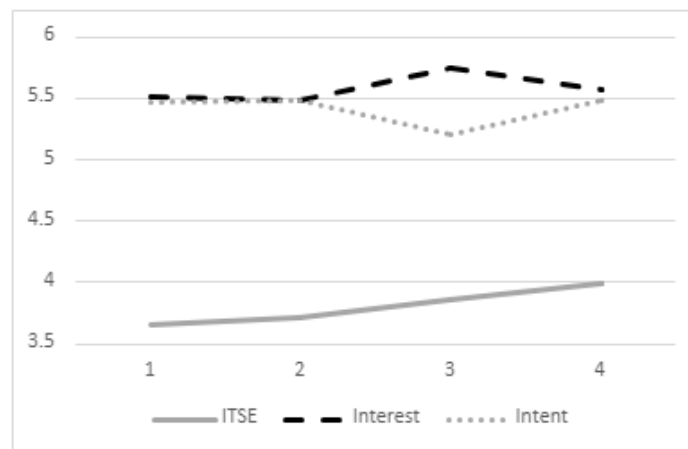

Figure 3. longitudinal impact

5. Discussion

It is important to satisfy the demand of the IT job market by encouraging more students to choose an IT-related field as their major. Interacting with high school students in their early career development can increase the possibility of opportunities to major in IT areas (Babin, Grant, & Sawal, 2010). This study builds on previous research using SCCT in IT (Luse, Rursch, & Jacobson, 2016; Luse et al., 2014; Rursch & Luse, 2019) and extends previous findings investigating why students choose to major in IT and the change in self-efficacy, interest, and intent to major over time by examining cross-sectional and longitudinal impacts in the choice model of SCCT.

Our research reveals that IT self-efficacy has a significant positive effect on interest, and intent to major and interest in IT have a significant positive effect on intent to major in IT before the program starts, which are consistent with previous research of cross-sectional studies in SCCT (Flores & O'Brien, 2002; Heinze & Hu, 2017; Luse et al., 2014). Subsequently, to measure the longitudinal impact of the three concepts, our results show that IT self-efficacy steadily increases over time. By completing more IT tasks successfully, students have more confidence to perform these tasks. Conversely, interest does not change while intention to major significantly decreases over time (Mohd Shahali et al., 2018). It is interesting to see in Figure 3 that this decrease in intent to major takes place in timepoint 3. It is possible that when students gain more understanding of IT, they might know what they really like or dislike and may have more thoughts and plans for their career development. Moreover, the quality of teaching and learning experience in the classroom might be another possible factor to impact interest over time (Xu, 2016). Furthermore, research indicates that

interest highly correlates with steady personality traits that do not change over time (Bonitz, Larson, & Armstrong, 2010), which may explain the lack of change in interest.

A surprising finding of this research involved the decrease in intent to major as the students progressed in the program; however, some previous research has found similar results (Henderson et al., 2022; Schultz et al., 2011). Henderson's study included college women who were interested in a STEM major (intending to major), were in STEM disciplines from various universities, and took part in a longitudinal survey of women's education and success without intervention. The survey contained educational experiences and achievements, psychosocial factors, and career aspirations. Although this study focused on different factors in the outcome of intention, the authors revealed a meaningful result about intention using a growth curve model. Specifically, female students expressed a high level of intention to persist in the science area at the beginning, yet as time went on, their intentions decreased and eventually leveled off. Moreover, Schultz's research conducted a quasi-experimental design for college students who had enrolled in a prototypical minority training program, named the RISE program, for 3 years. In this sample, all participants who were attending a 4-year university majoring in a STEM discipline showed that they wanted to pursue a science-related research career. The authors expected the RISE treatment group and matching control group to be similar on intention at the beginning and then these two groups would differ in their growth trajectories over time. The finding revealed that the trajectory of intention was negative in both the RISE and matching control students. Although students in the study showed interest in pursuing a scientific research career at first, the trend of intention declined steadily over time. These studies revealed that even though students have more training, their intention to major has a negative growth trajectory, which is consistent with our findings.

These results paint a disturbing picture of intent to major. We conducted additional post hoc analyses to further investigate the issues found with both interest and intent. Findings show that changes in interest positively affect changes in intent ($\beta = 0.568$, p = 0.030), whereby the greater the *increase* in interest, the greater the *increase* in intent to major. This implies that concentrating on increasing student interest can have a correspondingly greater increase in intent. Moreover, post hoc analysis also shows the initial level of interest has a positive effect on changes in intent to major ($\beta = 0.60$, p = 0.043), implying an accelerating effect in this relationship. Students with a high level of interest in IT at the start of the program are more likely to increase their intention of choosing IT as a major over time. Given these facts, for students who are predisposed, the program is more likely to increase their intention to major and it is therefore beneficial to expose students to IT concepts prior to the start of the program in order to see greater gains in intent. For implementation in practice, building supportive environments for these students is important. In our case, schools play an important role in the enhancement of student's interests and, in turn, positively impact intention. Schools as social support can provide adequate mentors, materials, classes, and events to let students explore IT. In addition, our program can help students with low ITSE to foster IT interests. The students who do not have much access to explore IT are likely to not have enough confidence to do IT tasks. Our program can increase their ITSE and in turn, positively impact IT interest.

Although this study reveals important findings, a few limitations cannot be ignored. Due to the low number of females in our sample, analysis by gender is not possible, especially in our imbalanced dataset that has only 6 females. Moreover, the participants are high school students under 18 years old. It is hard to track these students due to privacy concerns. In future work, we expect to look more in-depth to see if these students actually choose their major in IT once entering college. Furthermore, our program is designed to focus on three areas (cyber defense, game design, and robotics). Future research could add more subsections, such as business or database analysis. Future research might also consider conducting a qualitative study for further analysis. This type of qualitative analysis may also help to identify commonalities among those with decreasing intent to better understand the attributes of the specific individuals who are either not gaining interest or decreasing in intent to major over time.

This study contributes to understanding the longitudinal impacts of students prior to career development in information technology. Theoretically, this study extends social cognitive career theory for high school students with a longitudinal context. We found that high school outreach programs are effective at raising IT self-efficacy. Although our longitudinal results revealed an unsettling image in intention and interest where students' intention and interest did not increase during this program, post-hoc analysis shows that students can increase in intention to major in IT in college if interested in IT before engaging in the programs. This implies that a supporting environment could cultivate students' interests and that predisposed students can enhance the possibility of intention after joining the program. Moreover, our

program can encourage students to learn IT and conduct IT tasks successfully, which has a positive influence on their interests. Therefore, building a program for high school students is still valuable.

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8. Appendix

An IT-adventure program:
The content of the IT-adventure program can be found in previous work (Rursch et al., 2009). Here we list the main information of knowledge modules and lectures in three areas.
Lectures in cyber defense:
1. Operating systems, specifically FreeBSD
2. Basic Unix/Linux commands
3. Networking concepts - network addresses, cabling, devices, route tables
4. Networking concepts - ports and protocols, Wireshark, firewalls, netstat
5. Network services - Sendmail, DNS
6. Network services - POP/IMAP, Apache/PHP for web servers
7. Securing services - Focused on remote programming environment for FreeBSD
8. Securing services - Windows XP machines, as well as Frerunning; monitoring log files, examining processes, scanning networks/machines to determine what services are running
9. Securing services - More on Windows XP machines

Content to teach in game design:
This program mainly taught the syntax of a new computer language with the Alice software as well as the textbook of *learning to program with Alice*.

Robotics:
This program provides the Lego Mindstorm NXT base education kit, the educational resource kit and the Mindstorms NXT software v1.1. It also supplied the book *Building Robots with Lego Mindstorms* NXT with two sets of DVDs entitled Robotics Engineering Vol I and Robotics Engineering Vol II.

Measurement items:
IT Self-Efficacy: Measured from 1 (not at all confident) to 7 (totally confident)
I believe I have the ability to effectively set up an enterprise email server.
I believe I have the ability to administer group permissions in an enterprise.
I believe I have the ability to modify the configuration of a Web server.
I believe I have the ability to design an interactive user interface.
I believe I have the ability to program for effective user interaction.
I believe I have the ability to program stimulating game logic.
I believe I have the ability to successfully construct the physical structure of a machine.
I believe I have the ability to fine-tune gear ratios for a mechanical device.
I believe I have the ability to use available parts to accomplish a task.

Interest in IT: Measured from 1 (strongly dislike) to 7 (strongly like)
Maintaining hardware and software for my family and/or friends' computer(s)
Keeping up-to-date on the latest software
Researching components and building my own computer
Improving computer performance
Installing a new computer system

Intention to Major in IT: Measured from 1 (strongly disagree) to 7 (strongly agree)
I intend to major in an IT—related discipline upon entering college.

Author Biographies

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Gender, Emotional Intelligence, and the Need for Popularity: Exploring the Causes of Faux Pas Posting Beyond the Behavior of Friends

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Abstract

Inappropriate, or faux pas, posting on social media can negatively impact students while in college and after graduation. To better understand this phenomenon, researchers have investigated various factors that influence students to engage in this risky behavior. Previous research has shown the posting behavior of close friends to be a significant predictor of a student's own inappropriate posting. This study builds on existing literature by exploring gender, emotional intelligence, and need for popularity as potential causes of faux pas posting beyond the behavior of friends. Specifically, a survey of undergraduate college students (N=209) was used to measure the constructs of interest on four social media platforms: Facebook, Twitter, Instagram, and Snapchat. Supporting previous research, the results indicate the posting behavior of friends was a significant predictor of both general and specific faux pas posting across all four social media platforms. Although gender, emotional intelligence, and need for popularity were significantly related to faux pas posting on one or more platforms, none of the constructs provided more explanatory power than friend posting behavior alone. The study provides a discussion of these results and their implications for developing interventions and future research.

Keywords: Cybervetting, gender, emotional intelligence, need for popularity, faux pas posting

1. Introduction

Social media is so appealing to college students that 98% of them have accounts where they spend one to three hours each day (Ha et al., 2018; Tayo et al., 2019). Students spend their time on social media in a variety of ways, including sharing personal updates, connecting with friends, and commenting on social/political issues. College students are avid users of social media. In fact, emerging adults account for the largest social media usage compared to all other age groups (Holmgren & Coyne, 2017). Through their social media use, students can express themselves, connect to like-minded communities, and make new friends. While these benefits are significant, there are also negative outcomes that bear consideration.

Social media use has been shown to have a negative impact on college students' schoolwork (Junco & Cotten, 2011). Given the time that some students spend on social media, this may not seem that surprising. Even so, social media use can also have negative impacts that are less intuitive. As an example, social media use can negatively impact students' chances for employment after graduation. This is especially true if the students have engaged in posting behavior that would be considered inappropriate by potential employers. Recruiters are increasingly reviewing the social media content posted by job candidates as a part of the hiring process (Gruzd et al., 2020; Jacobson & Gruzd, 2020; Laukkarinen, 2023; Melão & Reis, 2021). These reviews, known as cybervetting, can uncover content that raises "red flags" for recruiters. Posting these types of inappropriate content (e.g., drug use, sexual activity, racist comments) has come to be known as faux pas posting (Karl et al., 2010). Given that students and young adults are the age group most likely to engage in faux pas posting (Roulin, 2014), this is a serious problem. Even after students are employed, social media use can still be risky. Faux pas posting is a common reason given by employers for termination. This is especially true in industries like business, medicine, and teaching (Barlow et al., 2015; Harwin, 2019; MacKenzie, 2016).

Previous research (Miller, 2020) has shown that the posting behavior of close friends has a significant impact on the content posted on students' social media platforms. Students whose friends post inappropriate content are more likely to post inappropriate content themselves. Friend posting behavior has even been shown to be a better predictor of student faux pas posting than the Big Five personality traits (Miller, 2020). Clearly, a student's friends matter when it comes to the content they post on social media.

While the posting behavior of friends is significant, the question remains – are there other factors that impact a student's decision to post inappropriate content? The current study will address this question by exploring potential factors drawn from existing research. Specifically, the study will explore the impact of gender, emotional intelligence, and need for popularity (NfP) on inappropriate social media posts by college students.

2. Literature Review

2.1 Inappropriate Social Media Posting

Social media is ubiquitous and college students are some of its most avid users. While students engage in social media for many different reasons, there are risks associated with its use - especially if that use involves posting content that is inappropriate, offensive, or unprofessional. Even when inappropriate posts are made to a select group of friends or followers, they can easily be shared outside of the student's intended audience. Some students post inappropriate content without giving their actions much thought, while other students view their posting behavior as a protected exercise of free speech. Regardless of their rationale, many of these students will come to learn that inappropriate, or faux pas, social media posting can have serious consequences.

Inappropriate posting behavior can be risky for students while they are still in school. Several universities have disciplined students for faux pas posting behavior, even when the posts were made in an off-campus setting (Barlow et al., 2015; Harwin, 2019). Students in disciplines such as medicine, teaching, or business who make inappropriate or unprofessional posts have been scrutinized both by their universities and their employers (Barlow et al., 2015; MacKenzie, 2016; Miller, 2020; Roulin, 2014). In their 2015 study, Barlow et al. examined the posting behavior of medical students in Australia, defining unprofessional content as "an online depiction of illegal activity, overt intoxication or illicit drug use, or the posting of patient information" (p. 2). Medical students in the study were largely aware of professionalism standards concerning social media use. The vast majority (90.5%), even agreed or strongly agreed that they were held to a higher standard for social media use than the general public. Unfortunately, this awareness of standards had little impact on actual posting behavior, given the prevalence of unprofessional content posted by

students in the study.

Faux pas posting can negatively impact students even after they graduate. As an example, a student who posts inappropriate content may find it harder to get a desired job. It has become common practice for recruiters to review the social media accounts of job candidates, often referred to as cybervetting (Roulin, 2014). Faux pas posts uncovered during these reviews can lead to negative hiring decisions. Even after a student gets employed, the risks of faux pas posting do not end. As many students have learned, employers are legally able to fire employees based on the content of their social media posts (MacKenzie, 2016; Spencer, 2022).

Given that students are aware of the risks posed by inappropriate posting on social media (Root & McKay, 2014), why do they continue to engage in this behavior? Researchers have attempted to answer this question by investigating several possible factors. One factor that has proven to be significant is the posting behavior of the students' close friends.

2.2 Friend Posting Behavior

The attitudes and values of a social group can have a powerful influence on the behaviors of individuals within the group. Likewise, culture and accepted norms for communication impact an individual's interactions within the group. Consistency of attitudes and behaviors of an individual in a social group will lead to further consistency of attitudes and behaviors as compared to individuals that have inconsistent attitudes and behaviors (Triandis, 1980).

Triandis' (1980) findings can be applied to college students in a social media setting. Specifically, students are swayed by the culture and accepted norms of their group – in this case, their social media friends. These influences can impact a student's social media posting behavior within the group. Those students who consistently mold their behavior to the group's norms and expectations may also become more accepting of those expectations. In this way, the posting behavior of a student's friend group ultimately shapes their own posting behavior.

Miller (2020) applied these psychological concepts to the impact of close friends on inappropriate social media postings. He found that students engage in more negative and inappropriate posting if similar content is present in their friends' postings. This result was significant for two reasons. First, the posting behavior of close friends proved to be a better predictor of student faux pas posting than any of the other factors considered in the study, including numerous personality traits. Second, the relationship between friend and student posting behavior was significant on multiple social media platforms. Students with friends who posted inappropriate content on Facebook or Twitter were more likely to post inappropriate content on the matching platform. The significance and persistence of friend posting behavior makes it a valuable predictor of faux pas posting by college students. That said, are there factors beyond friend posting behavior that can help explain faux pas posting?

2.3 Gender

Numerous previous studies (e.g., Karl et al., 2010; Tifferet & Vilnai-Yavetz, 2014) have shown that there are significant differences in social media use between males and females. Some of these differences include the types and quantity of content disclosed by each gender.

In their 2014 study, Tifferet and Vilnai-Yavetz examined the impact of gender differences on Facebook content posted by college students. College students were chosen for the study sample because they tend to be highly motivated to acquire friends through social media. The researchers were interested to know the types of content students would post to accomplish this goal. After examining the students' user profiles and cover photos, the researchers noted significant differences in content based on gender. Specifically, they found that males primarily posted images and information that would promote their status and demonstrate risk-taking behavior. Females preferred to share cover photos that focused on family and expressed emotions in their profiles.

Researchers like Tifferet and Vilnai-Yavetz explain these apparent gender differences using evolutionary psychology. They argue that the gender differences seen on social media have evolved over generations and are innate. Other researchers prefer Social Role Theory, arguing that gender differences are social expectations that are encouraged and taught. In the end, whether the differences are innate or social (or some combination of both), gender clearly plays a role in social media use and the content that is posted.

2.4 Personality Traits: Emotional Intelligence and Need for Popularity

Researchers have long sought to relate social media use with specific personality traits. Much of this research has centered on the Big Five personality traits (extraversion, agreeableness, openness, conscientiousness, and neuroticism). While this research has produced mixed results (e.g., Ross et al., 2009; Seidman, 2013; Marshall et al., 2015), there remains a persistent belief among many researchers that personality plays a role in social media use. This belief has led researchers to examine other connections between personality and social media, including personality's relationship with inappropriate posting.

Karl et al. (2010) investigated the relationship between the Big Five personality traits and faux pas posting by Facebook users. The results show that participants who scored high in agreeableness, conscientiousness, and neuroticism were less likely to post inappropriate content. More recent studies have found similar results. Miller (2020) extended the Faux Pas Scale developed by Karl et al. (2010) to include additional inappropriate behaviors identified by recruiters used for cybervetting. Participants' personality traits were again assessed using the Big Five, while they reported their faux pas activity on Facebook and Twitter separately. Participants with high levels of conscientiousness were less likely to post inappropriate content on Facebook, while those with high levels of agreeableness and contentiousness were less likely to post inappropriate content on Twitter. At the same time, participants high in openness reported high levels of inappropriate posting on Twitter.

Moving beyond the Big Five, Newness et al. (2012) added emotional intelligence to the list of personality traits being studied in relation to faux pas posting. In their study, they defined emotional intelligence as a set of interrelated skills concerning the ability to regulate and control the emotions of the self and others. Newness et al. (2012) argued that emotionally intelligent individuals will understand what types of information are appropriate and inappropriate. Additionally, individuals with emotional intelligence will be aware of the social consequences of making inappropriate posts. As such, they hypothesized that emotionally intelligent individuals will be less likely to engage in faux pas posting. While the study results support this hypothesis, emotional intelligence did not, in fact, predict faux pas posting beyond the level already accounted for by the Big Five personality traits. This leaves the final impact of emotional intelligence somewhat undecided.

Another personality trait that has been investigated in relation to social media use is need for popularity. According to Utz et al. (2012), need for popularity (NfP) can be viewed as a chronic desire to be viewed as popular. Individuals high in NfP are motivated to take actions that will make them appear popular. Social media is an ideal tool for individuals high in NfP because it provides a venue with a large audience where selective self-presentation is possible. In terms of college students with high-NfP personalities, social media gives them the ability to create impressive self-promotional profiles to share with their friends and others. These profiles can be managed to present the most up-to-date content – all in an effort to be maintain the image of popularity.

Researchers have shown that NfP is a significant predictor of social media posting behaviors (Utz et al., 2012). Of particular interest to this study, NfP was positively related to both self-presentation and disclosure of feelings. Given that how an individual presents themselves often depends on the situation and audience, students high in NfP could be more inclined to actively present an online image that is in-line with their audience, i.e., their close friends. At the same time, students high in NfP could also be more likely to disclose personal feelings to others. In a social media context, this means that NfP might lead students to post content that is more personal and emotional. This could result in students posting material that a more rational filter would have prevented.

3. Research Questions

Attempts to identify the factors that affect a student's decision to post inappropriate content have been mixed. The best predictor appears to be the posting behavior of close friends because it is both significant and persistent across platforms. That said, other factors have been shown to have an impact on student use of social media and the content they post (e.g., Karl et al., 2010; Newness et al., 2012; Utz, et al., 2012). While some of these factors have already been shown to be significant predictors of faux pas posting on one or two social media platforms, examining their impact across multiple platforms is worthwhile as a measure of their persistence. Ideally, these factors would prove to be significant beyond the predictive ability of friend posting behavior. To investigate these factors, the following research questions should be addressed:

RQ1: Does a student's gender affect their level of faux pas posting?

RQ2: Does a student's emotional intelligence affect their level of faux pas posting?

RQ3: Does a student's NfP affect their level of faux pas posting?

RQ4: Does a student's gender affect their level of faux pas posting beyond the posting behavior of their close friends?

RQ5: Does a student's emotional intelligence affect their level of faux pas posting beyond the posting behavior of their close friends?

RQ6: Does a student's NfP affect their level of faux pas posting beyond the posting behavior of their close friends?

4. Research Method

4.1 Measures

Emotional Intelligence

To measure the emotional intelligence of participants, the scale developed by Wong and Law (2002) was used. The 16-item scale asks participants about their ability to understand and regulate their emotions and the emotions of others. Participants responded using a seven-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree).

Need for Popularity (NfP)

Participant NfP was measured using the 12-item scale developed by Santor, Messervey, and Kusumaker (2000). The scale asks participants to report their willingness to do certain things in order to be viewed as popular by friends. Participants responded using a seven-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree).

Revised Faux Pas Scale

The Revised Faux Pas Scale was used to assess the level of inappropriate posting by participants and their close friends. The scale was developed by Miller (2020) using a combination of items from the original Faux Pas Scale (Karl et al., 2010) and new items that recruiters had determined to be problematic when cybervetting job candidates. Specifically, the revised scale asks if the social media account in question contains a lot of the given item. The eight items include "alcohol references," "drug references," "sexist comments," "racial comments," "gun references," "profanity," "sexual references," and "political comments". Participants responded using a seven-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree).

4.2 Participants

Study participants were recruited from undergraduate business courses at a large university in the Midwest United States. Given the research questions, the use of college students is appropriate since they are avid social media users, preparing to enter the job market, and their posting behavior can impact their employability. Participants were asked to complete a short online survey (Appendix I). All survey questions were evaluated and approved by the university's Institutional Review Board (IRB). Based on the nature of the questions, the students were assured that, if they chose to participate, their responses would remain anonymous.

5. Results

In total, 209 students (57.4% male) participated in the study. The mean age was 21.38 years (SD = 2.54), with a range from 18 to 39. Of the 209 participants, 172 (83.7%) had Facebook accounts, 130 (62.2%) had Twitter accounts, 184 (88.0%) had Instagram accounts, and 180 (86.1%) had Snapchat accounts. A detailed gender breakdown by platform is provided in Table 1.

	N	Male	%	Female	%
Facebook	172	94	54.7%	78	45.3%
Twitter	130	79	60.8%	51	39.2%
Instagram	184	102	55.4%	82	44.6%
Snapchat	180	101	56.1%	79	43.9%

Table 1. Gender breakdown by platform

Miller and Melton (2015) have shown that students don't exhibit the same posting behavior across social media platforms. For this reason, participants were asked to complete the Revised Faux Pas Scale based on their own posting behavior on each platform separately. They were also asked to complete the scale based on the posting behavior of their close friends for each platform separately. Table 2 provides the descriptive statistics and reliabilities for these faux pas scores, along with emotional intelligence and NfP.

Measure	Mean	SD	α
Emotional Intelligence	5.405	0.714	0.864
Need for Popularity	3.217	1.129	0.905
Facebook Faux Pas (Self)	1.666	1.145	0.934
Facebook Faux Pas (Friend)	2.908	1.532	0.929
Twitter Faux Pas (Self)	2.238	1.502	0.932
Twitter Faux Pas (Friend)	3.058	1.596	0.927
Instagram Faux Pas (Self)	1.813	1.204	0.916
Instagram Faux Pas (Friend)	2.824	1.515	0.913
Snapchat Faux Pas (Self)	2.086	1.308	0.905
Snapchat Faux Pas (Friend)	3.122	1.589	0.918

Table 2. Descriptive Statistics and Reliability of Measures

A review of the results in Table 2 indicates that faux pas scores for friend accounts are all higher than the scores students reported for themselves on the same platform. The results also indicate that the Revised Faux Pas Scale is highly reliable (α > .900) regardless of platform.

In terms of faux pas content, Table 3 shows the relative ranking (most to least common) of each item, by platform.

Facebook	Twitter	Instagram	Snapchat
Political (2.16)	Political (2.86)	Alcohol (2.36)	Alcohol (3.04)
Profanity (1.92)	Profanity (2.71)	Political (2.21)	Profanity (2.76)
Alcohol (1.72)	Alcohol (2.35)	Profanity (2.01)	Drugs (2.31)
Guns (1.63)	Drugs (2.33)	Drugs (1.76)	Sexual (2.07)
Sexual (1.6)	Sexual (2.28)	Sexual (1.73)	Political (1.82)
Drugs (1.49)	Guns (1.81)	Guns (1.55)	Guns (1.6)
Sexist (1.42)	Sexist (1.81)	Sexist (1.47)	Sexist (1.6)
Racial (1.4)	Racial (1.73)	Racial (1.41)	Racial (1.48)

Table 3. Faux Pas Item Ranking (most to least common) by Platform

The results in Table 3 indicate that, while there are some differences in the relative rankings by platform, posts with comments about politics, alcohol, and profanity are the most common. On the other end of the ranking, sexist and racial comments are the least common, regardless of platform.

5.1 Relationship of Gender, Emotional Intelligence, and NfP with Faux Pas Posting

To address research questions 1-3, correlations were calculated between the constructs of interest (gender, emotional intelligence, NfP, and friend faux pas posting) and the students' own faux pas scores for Facebook, Twitter, Instagram, and Snapchat. The correlations are shown in Table 4.

	n	Gender	Emotional Intelligence	Need for Popularity	Friend Faux Pas
Facebook	171	0.083	-0.093	0.059	0.488**
Twitter	130	0.137	-0.177*	0.210*	0.746**
Instagram	184	0.181*	-0.135	0.191**	0.628**
Snapchat	179	0.072	-0.180*	0.241**	0.697**

*p<0.05; **p<0.01

Table 4. Faux Pas (Self) Correlations

The significant correlations reported in Table 4 indicate that gender, emotional intelligence, NfP, and friend faux pas posting are each related to inappropriate posting by students on one, or more, social media platforms. For gender, the only significant relationship with faux pas posting is on Instagram. The positive correlation means that males are more likely to post inappropriate content on the platform as compared to females. Emotional intelligence is significantly correlated to faux pas posting on Twitter and Snapchat. In both cases, the relationship is negative meaning that students who are lower in emotional intelligence are more likely to post inappropriate content on these platforms. NfP is significantly related to faux pas posting on Twitter, Instagram, and Snapchat. These positive relationships indicate that students with a high NfP are more likely to post inappropriate content. Finally, faux pas posting by close friends is significantly correlated with inappropriate posting by students on all four platforms.

To further explore the relationships between the constructs of interest and faux pas posting, correlations were calculated between the constructs and the eight items of the Revised Faux Pas Scale for each social media platform (Tables 5-8).

	n	Gender	Emotional Intelligence	Need for Popularity	Friend Faux Pas
Alcohol	171	0.166*	-0.061	0.035	0.437**
Drugs	170	0.165*	-0.172*	0.118	0.410**
Sexist	171	0.042	-0.063	0.022	0.359**
Racial	171	0.026	-0.081	0.021	0.356**
Gun	171	0.058	-0.076	0.067	0.435**
Profanity	171	0.076	-0.127	-0.003	0.496**
Sexual	171	0.039	-0.048	0.021	0.408**
Political	170	0.015	-0.018	0.107	0.365**

*$p<0.05$; **$p<0.01$*

Table 5. Facebook Faux Pas (Self) Item Correlations

Table 5 shows that gender is significantly related to posting about alcohol (0.166) and drugs (0.165). This means that males are more likely to post about alcohol and drugs on Facebook than females. Emotional intelligence also has a significant relationship with posting about drugs. In this case, the correlation (-0.172) is negative, meaning that students high in emotional intelligence will be less likely to post content about drugs on Facebook. NfP has no significant relationships with the faux pas items on Facebook. Finally, inappropriate posting by friends on Facebook is significantly related to all eight faux pas items.

	n	Gender	Emotional Intelligence	Need for Popularity	Friend Faux Pas
Alcohol	130	0.051	-0.042	0.246**	0.645**
Drugs	130	0.065	-0.111	0.261**	0.623**
Sexist	129	0.177*	-0.205*	0.146	0.625**
Racial	130	0.145	-0.220*	0.194*	0.577**
Gun	130	0.161	-0.132	0.164	0.613**
Profanity	129	0.130	-0.232**	0.129	0.666**
Sexual	130	0.137	-0.189*	0.115	0.681**
Political	130	0.082	-0.064	0.151	0.543**

*$p<0.05$; **$p<0.01$*

Table 6. Twitter Faux Pas (Self) Item Correlations

A review of Table 6 shows that gender has a significant relationship with posting sexist content (0.177), meaning that males are more likely to post sexist material on Twitter than females. Emotional intelligence is significantly related to four types of inappropriate content on Twitter: sexist comments (-0.205), racial comments (-0.220), profanity (-0.232), and sexual references (-0.189). The negative correlations indicate that students with high emotional intelligence are less likely to post sexist, racial, profane, or sexual content. NfP is significantly correlated with posts containing alcohol references (0.246), drug references (0.261), and racial comments (0.194), meaning students with a need to be popular will be more likely to post alcohol, drug, and racial content. As with Facebook, inappropriate posting by friends is also related to posting about all eight faux pas items on Twitter.

	n	Gender	Emotional Intelligence	Need for Popularity	Friend Faux Pas
Alcohol	183	0.166*	-0.057	0.202**	0.515**
Drugs	184	0.227**	-0.157*	0.123	0.569**
Sexist	184	0.176*	-0.111	0.132	0.456**
Racial	182	0.125	-0.136	0.172*	0.459**
Gun	184	0.217**	-0.039	0168*	0.448**
Profanity	183	0.143	-0.148*	0.116	0.602**
Sexual	184	0.126	-0.141	0.184*	0.538**
Political	183	0.036	-0.085	0.132	0.445**

*$p<0.05$; **$p<0.01$*

Table 7. Instagram Faux Pas (Self) Item Correlations

Table 7 shows that gender has a significant positive relationship with posts containing alcohol references (0.166), drug references (0.227), sexist comments (0.176) and gun references (0.217). This means that males are more likely than females to post these types of material on Instagram. Emotional intelligence is significantly related to alcohol references (-0.157) and profanity (-0.148) indicating that students with high emotional intelligence are less likely to post content containing alcohol references and profanity. NfP is significantly correlated with posts containing alcohol references (0.202), racial comments (0.172), gun references (0.168), and sexual references (0.184). This means that students with a need to be popular will be more likely to post alcohol, drug, and racial content. As with Facebook and Twitter, inappropriate posting by friends is also related to posting about all eight faux pas items on Instagram.

	n	Gender	Emotional Intelligence	Need for Popularity	Friend Faux Pas
Alcohol	179	-0.023	-0.155*	0.233**	0.544**
Drugs	178	0.009	-0.168*	0.202**	0.582**
Sexist	177	0.126	-0.130	0.173*	0.516**
Racial	178	0.088	-0.138	0.226**	0.476**
Gun	179	0.103	-0.107	0.200**	0.513**
Profanity	178	0.022	-0.171*	0.171*	0.609**
Sexual	179	0.072	-0.126	0.208**	0.642**
Political	179	0.142	-0.115	0.124	0.454**

*$p<0.05$; **$p<0.01$*

Table 8. Snapchat Faux Pas (Self) Item Correlations

Reviewing Table 8 shows that gender has no significant relationship with the faux pas items on Snapchat. Emotional intelligence, on the other hand, is significantly related to posts containing alcohol references (-0.155), drug references (-0.168), and profanity (-0.171). Students with high emotional intelligence would, therefore, be less likely to post these types of content. NfP is significantly correlated with seven of the faux pas items. Only political comments are not related to NfP on Snapchat. Finally, faux pas posting by friends on Snapchat is related to all eight of the faux pas items.

5.2 Explanatory power beyond friend posting behavior

The results in Table 4 show that faux pas posting by close friends is related to a student's level of inappropriate posting on all four social media platforms. Perhaps more importantly, the results in Tables 5-8 show that friend faux pas posting is related to all eight of the faux pas items, regardless of platform. These findings support the conclusions from previous research that friend posting behavior is a significant and persistent factor in a student's decision to post inappropriate content.

At the same time, the results in Tables 4-8 also show that gender, emotional intelligence, and NfP have significant relationships with general, and specific, faux pas posting. While these constructs are clearly relevant to the faux pas posting discussion, the question remains, do they add any explanatory power beyond that provided by friend-posting behavior?

To address the question for each construct (research questions 4-6), a four-step hierarchical regression was performed for each social media platform (Tables 9-12).

	Beta	R^2	ΔR^2
Step 1		0.238***	
Facebook Faux Pas (Friend)	0.365***		
Step 2		0.244***	0.006
Facebook Faux Pas (Friend)	0.364***		
Gender	0.180		
Step 3		0.244***	0.000
Facebook Faux Pas (Friend)	0.365***		
Gender	0.180		
Emotional Intelligence	0.010		
Step 4		0.245***	0.001
Facebook Faux Pas (Friend)	0.368***		
Gender	0.175		
Emotional Intelligence	0.007		
Need for Popularity	-0.020		

*p<0.05, **p<0.01, ***p<0.001*

Table 9. Hierarchical Regression for Facebook Faux Pas (Self)

Table 9 shows the results of the hierarchical regression for Facebook. In the first step of the regression, friend faux pas posting was entered as the control variable. Friend faux pas posting was found to be significant with the model explaining 23.8% of the variance in inappropriate posting behavior. In the following three steps, gender, emotional intelligence, and NfP were added respectively. Although each step of the regression produced a significant model, none of the added constructs was significant. The change in R^2 produced by each step was also not significant.

	Beta	R^2	ΔR^2
Step 1		0.556***	
Twitter Faux Pas (Friend)	0.702***		
Step 2		0.563***	0.007
Twitter Faux Pas (Friend)	0.696***		
Gender	0.257		
Step 3		0.564***	0.001
Twitter Faux Pas (Friend)	0.691***		
Gender	0.251		
Emotional Intelligence	-0.063		
Step 4		0.564***	0.000
Twitter Faux Pas (Friend)	0.689***		
Gender	0.253		
Emotional Intelligence	-0.061		
Need for Popularity	0.013		

*p<0.05, **p<0.01, ***p<0.001*

Table 10. Hierarchical Regression for Twitter Faux Pas (Self)

The four-step hierarchical regression for Twitter can be seen in Table 10. Again, friend faux pas posting was added in the first step, producing a significant model that explained 55.6% of the variance in inappropriate posting behavior. Just as with Facebook, the addition of gender, emotional intelligence, and NfP produced significant models but none of the constructs proved to be significant. The change in R^2 was also not significant for the step two, three, and four models.

	Beta	R^2	ΔR^2
Step 1		0.394***	
Instagram Faux Pas (Friend)	0.500***		
Step 2		0.407***	0.012
Instagram Faux Pas (Friend)	0.490***		

	Beta	R^2	ΔR^2
Gender	0.270		
Step 3		0.407***	0.000
Instagram Faux Pas (Friend)	0.489***		
Gender	0.270		
Emotional Intelligence	-0.012		
Step 4		0.410***	0.004
Instagram Faux Pas (Friend)	0.478***		
Gender	0.291*		
Emotional Intelligence	-0.004		
Need for Popularity	0.068		

*p<0.05, **p<0.01, ***p<0.001*

Table 11. Hierarchical Regression for Instagram Faux Pas (Self)

Table 11 shows the results of the hierarchical regression for Instagram. As with Facebook and Twitter, friend faux pas posting produced a significant model in step one, explaining 39.4% of the variance in inappropriate posting behavior. Emotional intelligence and NfP were not significant when added to the model. While gender was significant in the step four model, no model produced an R^2 change that was significant compared with the step one model.

	Beta	R^2	ΔR^2
Step 1		0.486***	
Snapchat Faux Pas (Friend)	0.572***		
Step 2		0.488***	0.002
Snapchat Faux Pas (Friend)	0.571***		
Gender	0.121		
Step 3		0.489***	0.001
Snapchat Faux Pas (Friend)	0.566***		
Gender	0.124		
Emotional Intelligence	-0.048		
Step 4		0.490***	0.001
Snapchat Faux Pas (Friend)	0.556***		
Gender	0.142		
Emotional Intelligence	-0.041		
Need for Popularity	0.052		

*p<0.05, **p<0.01, ***p<0.001*

Table 12. Hierarchical Regression for Snapchat Faux Pas (Self)

Finally, Table 12 shows the results of the hierarchical regression for Snapchat. Much like Facebook and Twitter, only friend faux pas posting proved to be significant, producing a model in step one that explained 48.6% of the variance in inappropriate posting behavior. None of the other constructs were significant, nor were the changes in R^2 for steps two, three, and four.

In terms of the research questions, the results of the hierarchical regressions indicate that gender, emotional intelligence, and NfP do not appear to significantly affect a student's level of faux pas posting beyond that already explained by the posting behavior of their close friends for Facebook, Twitter, Instagram, and Snapchat.

6. Discussion

The objectives of this study were 1) to better understand connections between gender, emotional intelligence, and need for popularity and level of inappropriate posting; and 2) to gain insight into how gender, emotional intelligence, and need for popularity affect posting behavior beyond the posting behavior of close friends. The results from this study provide valuable insights into both of these research questions, although more inquiry is needed in several areas.

Friends' influence on posting behaviors clearly emerged as the most compelling factor in the study. The influence of friends was a pronounced and common thread that ran throughout the findings, crossing all four platforms and all eight

content areas. Perhaps more remarkable, the study's failure to locate explanatory power beyond friends' influence underscores its outsized importance in college student's posting behavior.

That being said, the study's findings related to other factors were also important and point to promising avenues for additional study. Of note, gender was found to be tied to inappropriate posting, with males being more prone than females to engage in inappropriate posting, pointing to the need for further research. Additionally, capacities such as emotional intelligence and the need for popularity were clearly connected to individuals' internet behavior. Each of these three observations is noteworthy in isolation, but together they paint a more complex picture of the varied forces involved in the persistent phenomenon of faux pas posting.

Other findings were less pronounced, but some outlines can be drawn. For example, it seems that Instagram is associated with different posting behaviors by gender, perhaps reflecting different overall uses and expectations for the platform. For emotional intelligence, both Snapchat and Twitter are meaningfully connected, which is interesting, given the very different private and public orientations, respectively, of these platforms. And when it comes to the need for popularity (NfP), Twitter, Instagram, and Snapchat are associated, perhaps reflecting the overall virtual location of where students vie for popularity now. Not surprisingly, Facebook is somewhat of an outlier in this regard; similar to other studies (e.g., Pew 2023), it does not seem to be a site of active engagement, possibly being used mainly to connect with older family members or organizations and is therefore in a different category from other platforms. Yet, even Facebook conforms to the general pattern of the outsized importance of friends' posting behaviors on participants' own.

7. Implications and Future Research

Building on the findings of previous research, this study is the first to investigate the impact of friends' behavior on student posting across four of the most commonly used social media platforms. The study's results confirm that the influence of friends is significant across all four platforms. Given the differences in the design and uses of these platforms, the persistence of friends on posting behavior is of particular interest and calls for further research.

If faux pas posting is a continuing problem, one possible way to address it would be to develop targeted educational interventions that include friends as a major focal point. We know that for young adults, who may not yet have formed a strong sense of self, the influence of friends can be great. That effect was so great in this study as to suggest that the effectiveness of potential interventions by parents, teachers, or others may be quite limited, compared to the influence of friends, when it comes to faux pas posting. Thus, a friends-based influence program would likely be more effective than a purely posting-focused training program or educational regime. Given the significance and persistence of this finding, determining *how* to do these things well is an important site for future research.

At the same time, while findings related to friends were key, this study is also the first to investigate the impact of gender, emotional intelligence, and need for popularity in the context of faux pas posting across multiple social media platforms. Although the results in these areas do not show additional explanatory power for these constructs, the significant relationships between the constructs and faux pas posting bear further investigation. Faux pas posting is a serious issue—affecting students, graduates, and employed professionals. Understanding the factors that lead to faux pas posting is a first step in ultimately designing effective interventions. For instance, factors such as emotional intelligence and need for popularity (NfP) were shown to be related to inappropriate posting by students on several social media platforms and should also be considered. As with the recognition of the influence of friends, these findings suggest that interventions focused on posting behavior itself may not be as effective as building up students' underlying capacities. For example, given the negative relationship of emotional intelligence to faux pas posting, a course in emotional intelligence may have a strong beneficial effect on student decision-making in this area. While there does not seem to be an obvious strategy to address the relationship between need for popularity (NfP) and inappropriate posting, these findings serve as a reminder that social media platforms are a key site for many students to pursue the need for popularity. As such, social media platforms need to be conscious of their design choices and how those choices will ultimately affect their users and their posting behavior.

Additionally, the greater propensity of males to post inappropriate content is also an important consideration in intervention efforts and platform design. This finding was common enough across several platforms and content types that it deserves additional attention. As with the influence of friends on posting behavior, this finding is not all that surprising, given the generally slower pace of emotional and academic development of males compared to females and generally negative trends in male educational attainment, which are leading to lower professional attainment and consequent negative impacts on society (Reeves, 2022). However, the pervasive nature of these findings also points to

an important consideration for educators, policy makers, and designers: the ubiquity of the relationship of gender and inappropriate posting suggests that it is not simply a matter of individual agency but that a wider lens must be used in research to understand and respond to it, a need that is underscored by the range of potential negative consequences.

Finally, while there may be a role for education and training in the effort to address faux pas posting, there is an even greater place for the social media platforms and their system designers, given their ubiquity and power to shape behavior. Increased pressure from the public has focused on ethical design from social media platforms (Center for Humane Technology, 2022). Such pressure has already led to legislative action at the state (Kern, 2022) and federal (Jalonick, 2023; Poonia, 2023) levels, as well as legal action in the courts (Sherman, 2023). The government is now actively questioning the pervasive nature of social media in the lives of young people. These questions do not solely involve content but are focused on a variety of issues including addictive algorithms (Kern, 2022), data privacy (Jalonick, 2023), and transparency (Poonia, 2023). Addressing these problems requires good research and correspondingly well-informed public policy makers. Researchers can assist system and interface designers and public policy makers in addressing these very important questions by investigating real-world issues like faux pas posting and its related factors.

Future research might focus on 1) understanding this study's findings at a deeper level with respect to the influence of friends, gender, and emotional intelligence on posting behavior, 2) studying responses informed by these findings, such as interventions and programs; and 3) studying the way platform design and related technologies relate to these findings. The first area provides a rich area for research. For example, inquiry could be made into why friends are influential on social media, what makes certain friends more influential than others, and how that influence changes over time. Or we might study how the design of social media platforms interacts with factors such as gender and emotional intelligence. Research in the second area could focus on specific interventions and how they work, such as finding ways to use the influence of friends positively. It could examine how gender differences are relevant to different kinds of interventions. This research could find ways to build capacity in emotional intelligence and how this affects faux pas posting behavior. Research in the third area could also look at the problem from a design perspective—for example, finding ways to make apps foster rather than dissuade healthy posting behaviors.

More holistically, future research could examine how societal conditions influence posting behaviors and how to create alternative venues for building popularity. For example, if students are driven to post faux pas content related to a need for popularity, do they have opportunities to interact in other ways? Do they need to be taught social skills that will give them an alternative outlet? They may be "digital natives," but do they need to be taught face-to-face skills or intentionally be put in situations where they need to apply them?

8. Conclusion

In summary, the negative downstream consequences of faux pas posting make gaining a better understanding of student posting behavior crucial, not only for the educators who teach students but also for the companies that will hire them, as well as for designers and advocates for better platform design. Whether in practical or research settings, this study makes it clear that the influence of friends' online behavior must always be a paramount consideration in this regard. Likewise, the greater tendency of males to make faux pas posts is noteworthy and should be pursued further in both research and professional settings. Finally, it should be remembered that the development of emotional intelligence can be an important defense against potentially career-damaging posting behaviors. Overall, we should recognize the extraordinary reach of social media as a means for individuals to pursue motivations, such as the need for popularity. Helping students prepare for and respond to these realities is crucial, as is advocacy for healthy and humane design. Though more research is needed in these areas, the current study is one step along the path in addressing these needs, within a technological and social environment that will continue to change throughout the lifetimes of today's young adults.

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Appendix I

1. What is your gender?
   - Male
   - Female

2. What is your age?

3. What is your academic classification?
   - Freshman
   - Sophomore
   - Junior
   - Senior

4. Please indicate how much you agree, or disagree, with the following statements:
   - I have a good sense of why I have certain feelings most of the time.
   - I have good understanding of my own emotions.
   - I really understand what I feel.
   - I always know whether or not I am happy.
   - I always know my friends' emotions from their behavior.
   - I am a good observer of others' emotions.
   - I am sensitive to the feelings and emotions of others.
   - I have good understanding of the emotions of people around me.
   - I always set goals for myself and then try my best to achieve them.
   - I always tell myself I am a competent person.
   - I am a self-motivated person.
   - I would always encourage myself to try my best.
   - I am able to control my temper and handle difficulties rationally.
   - I am quite capable of controlling my own emotions.
   - I can always calm down quickly when I am very angry.
   - I have good control of my own emotions.

5. Please indicate how much you agree, or disagree, with the following statements:
   - I have done things to make me more popular even when it meant doing something I would not usually do.
   - I've neglected some friends because of what other people might think.
   - At times, I've ignored some people in order to be more popular with others.
   - I'd do almost anything to avoid being seen as a "loser."
   - It's important that people think I'm popular.
   - At times, I've gone out with people just because they were popular.
   - I've bought things because they were the "in" things to have.
   - At times, I've changed the way I dress in order to be more popular.
   - I've been friends with some people just because others liked them.
   - I've gone to parties just to be part of the crowd.
   - I often do things just to be popular with people at school.
   - At times, I've hung out with some people so others wouldn't think I was unpopular.

6. Please think about your account and consider how much you agree with the following statement for each of the listed topics.   My account contains a lot of_____.
   - alcohol references
   - drug references
   - sexist comments
   - racial comments
   - gun references

- profanity
- sexual references
- political comments

7. Now think about the accounts of your close friends and consider how much you agree with the following statement for each of the listed topics.   My close friends have accounts that contain a lot of_____.
    - alcohol references
    - drug references
    - sexist comments
    - racial comments
    - gun references
    - profanity
    - sexual references
    - political comments