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Major Problems: Choice of Major by Transgender College Students

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Abstract

Despite the increasing visibility of LGBTQ identities in today's society, there is still a lack of research on how students of these identities navigate higher education. In particular, the factors that determine the choices of major of transgender college students are not well known. This study aimed to answer several questions about how transgender students select majors, including whether they select majors differently than their cisgender peers, what factors drive their decisions, and how they navigate their chosen majors. The study utilized a mixed methods approach, including the use of a survey on major choice and satisfaction with majors distributed to LGBTQ collegians (N=53) as well as a series of semistructured interviews conducted with five volunteer transgender students. Surveys were analyzed quantitatively to determine whether several surveyed variables differed between cisgender and transgender populations. Interviews were transcribed, coded, and analyzed for trends in a qualitative analysis. Findings suggest that, while transgender students often face many challenges and a general lack of support for their identities regardless of major, these students display several forms of resilience within their majors that allow them to navigate their chosen fields. The paper concludes with a discussion of the implications of this research as well as suggestions for future research.

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Creating a thesis that is composed of original work in an understudied area is challenging at the best of times. Working on such a thesis in the middle of a global pandemic, however, makes such a feat even more difficult. Without the great amount of support and guidance that I received from many people in my life, this thesis might never have come to be.

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It is an undeniable truth that no two people are the same. While this fact is, in all senses, quite obvious to say, it has taken until recent years for the true diversity of human experience to become recognized for what it is, and many still struggle to have their particular experiences, struggles, and triumphs recognized by broader society. This is true of all those whose identities fall under the umbrella of the LGBTQ acronym and social movement, and particularly true of transgender people. Despite people of these identities becoming increasingly visible in society (Quinn and Meiners 2016), there is still a dearth of research relating to how people of these identities navigate education and particularly higher education, and the factors that influence them in their time in the educational system. Thus, there is a defined need for more research on people of these diverse identities in order to understand the challenges they face, the strategies that they use to navigate these challenges, and how to better support them.

The current study aims to identify how transgender students select fields of study in higher education. Specifically, this study aims to look at the major choice of students of these identities, and the factors that might attract them to or push them out of majors. The following specific questions were posed:

1. Do transgender college students show differential participation in different majors/fields, and if so, what does the distribution look like?
2. What factors most affect transgender participation in a class or field?
3. How do transgender students navigate their chosen majors?

This study aims to collect data from many students in order to identify trends in major selection at the college where the study occurs. So as to depart from the deficit view often presented in studies of students with these identities (Tuck 2009), this study also aims to identify trends in

how students confront and triumph over the challenges presented to them in pursuing college majors, and to highlight points of resilience. Through the use of a survey and semistructured interviews, the study aims to provide students of these identities with a voice in the research and an opportunity to discuss their often invisible struggles.

I propose that transgender students do not show differential participation in different fields as a result of similar, negative experiences found in all fields. As a result, transgender students choose fields based on academic interest rather than factors related to transgender identity. I also discuss the strategies of resilience that transgender people utilize in order to navigate the challenges that they encounter in their chosen fields.

The paper will begin with a review of existing literature on climate, so as to provide a framework of analysis for the study. We shall then review existing literature related to LGBTQ issues in higher education as well as literature on gender and major choice so as to provide context for the study. The methods section will then detail the research methods employed in the study, including a survey and a series of interviews with transgender participants. The data obtained from these methods will then be presented, followed by analysis and synthesis of the data collected. Finally, the paper will conclude with a discussion of the implications of this research, as well as offering suggestions for future research.

Framing the Study

Before we discuss the bulk of the research that provides the context for this study, it is important to clarify terms and discuss some of the issues surrounding the study of LGBTQ students in research. There are two major categories to discuss, each with their own implications to this study: issues of terminology, and issues of entanglement of identities under the LGBTQ umbrella. We will discuss each of these in turn before moving on to discuss the framework of the study.

Representing LGBTQ Communities: Issues of Terminology

While one can easily point out some of the issues in existing research (and particularly older research) focused on LGBTQ communities, one must also acknowledge the difficulties entailed in studying these communities. LGBTQ communities are constantly evolving and changing, and with this change comes frequent changes in terminology and in how these identities are discussed. Because of this, older research on these identities can often come to be outdated fairly quickly as LGBTQ identities evolve. For instance, research on "gay" people before the turn of the century often either neglects the existence of bisexual people or clusters them into the same group as gay people. Research that talks about "transexual" people, as another example, may not be fully applicable to transgender people of the modern era, who have moved away from that term due to its connotations as having a sexual element involved in the identity, which is not always applicable. For this reason, it is important to consider how definitions used in past research might impact findings, and how differences in definitions between when the research was conducted and current times might impact one's consideration of the results.

The dilemma of terminology is not just an issue with older research, but with how current research is conducted, as well. There are many different identities that fall under the umbrella of LGBTQ, and just as many disagreements on how these identities should be defined, or even if they should be formally defined at all. The acronym LGBTQ itself is a subject of debate– LGBT and LGBTQI both see common usage in different areas of the world, and a plus can be added on to the end of any of these to form additional permutations (i.e. LGBTQ+). In this paper, we will use LGBTQ, with the idea that the important part of the acronym for its usage in this paper is that it represents the group of individuals that deviate from the norm of cisgender, perisex, and heterosexual.

Given the debate over definitions for almost every identity under the LGBTQ umbrella, the question arises: how do you pick definitions for use in a study? The answer that many qualitative researchers have suggested is simply that we as researchers do not (e.g. Nicolazzo 2017). Generally, the accepted best practice for definitions of LGBTQ identities is to allow participants the opportunity to define their own identities from their own perspectives, as these identities can mean something different to the different people that hold them. While this may provide some challenges in interpreting results, it is simultaneously likely to give a better idea of how students actually perceive themselves, rather than attempting to categorize them into something with which they may not identify.

This same issue arises with another term relevant to these communities: the idea of sexuality itself. The term used to describe a person's attraction towards another person has been variably called sexuality, sexual identity, sexual orientation, romantic and sexual orientation, and more. The terms used in research and within these communities are, by most measures, completely nonstandard (Eliason 2014). While there have been arguments for standardizing this

language into a single, concrete set of rules, to do so would contradict the earlier discussed ideas of the constantly evolving nature of these identities as well as the idea of allowing people to define their identities in their own terms. For the purposes of this paper, we will use "sexuality" to represent the broad concept of interpersonal attraction and "sexual identity" to represent the concept of discrete orientations of attraction, especially those which may lie outside of normative perceptions. For any portion of the research which is based on a participant's responses, however, we will utilize the term or terms that the participant used.

The Entanglement of Gender and Sexuality

Before we begin discussing existing research on LGBTQ students in higher education, we must first discuss the entanglement of gender and sexuality within research. Experiences of transgender students in higher education research have often been overtaken by dominant LGBQ narratives (Garvey et al. 2019), rendering transgender experiences far less represented in the research even as research on LGBTQ students in education has supposedly increased over the years (Kosciw et al. 2013). While the following literature review will attempt to disentangle these dominant LGBQ narratives in research from research specifically focused on transgender experiences, it is worth noting that gender and sexuality have been so historically entangled within research that this may well be impossible. In order to address this in this literature review, we will examine research that has been done on transgender people separately from that which has been done without this specificity. However, we also recognize that research on the broader LGBTQ community still has applicability to transgender students, and that there is value in discussing this research as well in search of broader themes that may be applicable to our research.

Selected Literature

In order to frame the study, we will be examining research related to climate and microclimates, research related to LGBTQ identities in higher education, and research related to gender and major choice. By tying these three literatures together, this study aims to provide a new and nuanced understanding of major choice as it relates to transgender students. Since gender has typically been examined in binary and gender normative fashions, the integration of ideas from LGBTQ focused research (using climate as a framework) aims to break down these normative conceptions to provide a more comprehensive basis for the research.

Climate Research

The concepts of climate and microclimates have often been used to frame student experiences within higher education. Climate, usually defined as the set of perceptions of a particular environment that impact a person's experience in that climate, has been shown to play a strong role in impacting many parts of a person's time in an educational system. Students' perceptions of school climates have historically been associated with positive psychosocial and academic adjustment (Toomey et. al. 2012), as well as academic persistence and outcomes (Garvey et. al. 2019, Kosciw et. al. 2013). These effects demonstrate the importance of understanding campus climates when considering students in higher education in general, but research has shown that climate is an especially strong predictor of outcomes (such as academic achievement, persistence, and enjoyment) for LGBTQ students even more than other groups of students (e.g. Nicolazzo 2017, Garvey et. al. 2019). Thus, in order to study the student experiences found in this study, climate is a useful framework.

Microclimates

A useful extension of climate as a framework is the concept of microclimates. Microclimates are smaller social climates within a broader institution that possesses their own climate, often with unique elements that differ from both the broader climate of the institution as well as other coextant microclimates within the same parent institution. Academic disciplines within higher education have been theorized as distinct microclimates within a college or university (Vaccaro 2012). An important factor to consider with these microclimates, however, is that while discipline microclimates might bear some similarities across colleges and universities, they can also vary widely between these institutions due to factors such as faculty-student relationships (e.g. Renn 2007) and peer relationships (as shown in Nicolazzo 2017) that are unique to a particular institution. Both faculty-student relationships and peer relationships have been shown in microclimate research to be mediated by factors such as microaggressions, perceived safety of certain spaces within a microclimate, and diversity of individuals within a microclimate (Serrano 2020). Safety in general also plays a major role in perceptions of microclimates, as single incidences of a breach of safety can be magnified within a smaller context (e.g. Vaccaro 2012, Bradshaw et al. 2014). Student experiences within a discipline are often affected by microclimates outside of a college or university's department as well. For instance, LGBTQ centers that connect students with resources may enable students to succeed within a department independent of support within a department's microclimate and can alter how a student interacts with these departments (Nicolazzo 2017, Garvey et. al. 2019). These microclimates outside of departments can vary as well– while LGBTQ centers might theoretically provide resources to students, transgender students in particular often experience tensions due to microaggressions encountered in these spaces enacted by LGBQ people (e.g. Nicolazzo 2017, Duran & Nicolazzo 2017) which may turn them away or even intentionally

exclude them from these resources. There are many microclimates that students encounter within an institution of higher education, all of which may impact their interactions with the specific microclimate of an academic discipline as well as their interactions with the broader climate of the institution as a whole.

Measuring Climates and Microclimates

While climate is often analyzed qualitatively, there exist multiple ways of measuring climate both qualitatively and quantitatively. When quantitative measures are desired, statistics on quantity of available resources are often used, as are statistics on incidence rates for type of victimization (e.g. Kosciw et al. 2013). Coding of interview responses is also common practice (e.g. Garvey et al. 2019, Toomey et al. 2012), typically using coding schemes developed for the purposes of the specific project's aims. Statistical analysis of survey responses is also a very common method of quantitative analysis of climate (e.g. Galotti et al. 2016). Analysis of interview responses for trends is another common qualitative sociological method for measuring climates. In considering what how to best capture and represent student experiences, qualitative analysis may counter a deficit view, as it allows for narratives of resilience to more easily be displayed alongside the challenges that LGBTQ students and particular transgender students face (Nicolazzo 2017). By not simply presenting quantitative data as its own truth, and instead either accompanying it or replacing it with more holistic investigations that touch upon both struggles and resilience, narratives that might characterize a community as broken or downtrodden can be challenged.

Relation to Current Study

Climate and microclimate have been occasionally used as frameworks through which to understand the concept of major choice; however, they are far from the dominant means of doing

so, especially when considering how identity impacts major choice. College majors are evident microclimates within the broader climate of a college institution, and the idea of these separate yet significant microclimates will help to form the basis of our analysis in this research. In this research, participants' responses to questions on their perceptions of their majors (and therefore the microclimates of their majors) will be used to gain both quantitative (through survey questions) and qualitative (through interviews) data on these microclimates. In order to better understand how climate and microclimate can be applied to the analysis of how gender (and thus gender identity) impact college major choice, however, it is necessary to first examine the broader research available.

Climate and LGBTQ Research in Higher Education

In this section of the literature review, we will examine work that has been done in relating gender and sexuality to higher education. Apart from work surrounding curriculum and instruction, many of the themes found in this work can be tied to the concepts of climate and microclimates. As discussed at the beginning of the literature review, the evolving nature of LGBTQ identities necessarily means that a lot of work previously conducted on these identities can quickly become outdated. Thus, the material selected to be reviewed comes from only the past twenty years of research. In order to avoid the entanglement of gender and sexuality that has been found in literature, this section will be divided into research that focuses primarily on LGBQ identities and research that focuses primarily on transgender identity. Overall, the research points to the salience of LGBTQ identities and the strong need to provide support to students of these identities so as to not imperil them in their experiences in education.

Research on LGBQ Identities in Higher Education

The majority of research that has been conducted on topics relating to LGBTQ identities is focused on sexuality. The reasoning for this is, in many respects, obvious– sexual identity has been in the public conscience for far longer than gender identity has. One can find research on gay students dating back to even as "early" as the 1970s. With the evolving understanding of sexual identities, research on these identities has become less about understanding why people have these differences and become more about how to support people of non-straight sexual identities. Surprisingly, however, it would seem that not much about the aims and the distribution of this research has changed since the turn of the century. In 2004, Dilley (2004) suggested that much of the research on LGBTQ issues in higher education (which strongly favored LGBQ issues at the time) could be categorized into three general categories: school climate, student life issues, and explorations of how these issues affect college teaching. Research from the years since then have seemed to largely fall into similar categories as well, with school climate, student social interactions, and curriculum and instruction all being major areas of research.

School climate is one of the most prevalent domains within higher education research on LGBTQ identities. As discussed previously, this research often revolves around both school climate as a whole as well as microclimates within a college or university (Vaccarro 2012). It has been asserted that, in particular, a negative school climate has a very strong effect on LGBQ students compared to other students (Kosciw et al. 2013), consistent across multiple domains including academic achievement, persistence, and satisfaction. This has been posited to be in part due to the high salience of LGBQ identities for students that identify with them (Lee & LaDousa 2015). School climate is also often studied in relation to more basic factors such as student safety (e.g. Toomey, McGuire and Russell 2012), since safety is not a given for LGBQ students.

While we discussed the details of climate-focused research earlier in this paper, it is worth noting here that it comprises a sizable portion of the research on students of LGBQ identities.

Another area of research on the experiences of LBGQ students in higher ed focuses on the interactions of LGBQ students with the people and microclimates around them. This can include interactions with other students, interactions with faculty, and interaction with non-faculty staff within an institution of higher education. Relationships between LGBQ students are often seen as paramount to students' survivability, with student organizations in particular being well-studied as centers of student resilience (Revilla 2010). Student relationships with the faculty and staff they encounter are also frequently emphasized as being significant, both for influence on student perspectives on the institutions as a whole (Kosciw et al. 2013) on student perspectives on their surroundings in various ways, including, again, safety (Toomey et al. 2012). Generally speaking, any and all person-to-person interactions that LGBQ encounter during their time in educational systems are considered as very strong influences on student academic achievement, retention, and other measures of success. Given that even singular interactions can have such a strong impact on student outcomes, it thus becomes evident that considering climate down to the level of microclimates is essential in discussing these identities.

The last major category of research pertaining to LGBQ identities relates to curriculum and instruction. A fair amount of research examines both how LGBQ-related subjects *should be* taught, as well as how they *are* taught, and the reasoning behind each of these. It does not take a great deal of research to note that LGBQ-related topics are either discouraged from being discussed or directly prohibited from being discussed in many places across the United States. Much of the research that falls under this category arrives at a very similar point: that it is important for curricula to be inclusive of these identities, with the inclusion of LGBQ topics

reaping a plethora of rewards including improved school environments and greater student academic achievement (e.g. Snapp and Russell 2017). Apart from this general point of consensus, however, research on LGBQ identities and curriculum is surprisingly varied, with research ranging from topics such as the interaction of these identities with concepts like the active classroom (Cooper and Brownell 2016) to investigations on how to tailor curricula to support students in particular subjects (e.g. Butterfield, McCormick, and Farrell 2018).

Research on Transgender Identities in Higher Education

Research on gender within the field of education has historically been binary and transgender-exclusive, and this fact remains mostly true today. However, there is also work emerging that views gender under different lenses than the typical biological binary that is often assumed. Here we will focus on gender research that specifically addresses transgender students. There are, unfortunately, significantly fewer articles that address transgender students as a separate group, rather than combined with LGBQ issues. Research that focuses specifically on transgender students also tends to ask more broad questions, and exploratory studies are more common. Much like research on LGBQ issues, research on transgender issues can be broken down into categories; however, some of the categories that are viewed as separate in LGBQ research tend to have less definite boundaries in transgender research. While school climate, student social interactions, and curriculum and instruction are all still prominent trends in research, school climate and student social interactions are often more blended in research focusing on transgender students, thus leaving us with two major categories to discuss.

School climates and microclimates, along with the interactions that create them, are a strong focus in transgender-specific research. The most obvious (as well as most studied) examples of the influences of climate and microclimates surround student interactions with

transphobia (e.g. Siegel 2019). The general conclusions of this type of research are what one might expect: transphobia leads to all-around worse experiences and worse results (achievement, persistence, sense of belonging, etc.) for transgender students in higher education (Siegel 2019, Newhouse 2013). This type of research often feeds into the deficit view that permeates discussion of transgender students in higher education, which has led in more recent years to research that directly contradicts this idea and shows the resilience of transgender college students (Nicolazzo 2017). Research in this paradigm often focuses on how transgender students defy climates and microclimates that would otherwise oppress them. For instance, the idea of "third spaces" has been applied to transgender students to explain how separate spaces for transgender students can serve to help them resist unfavorable microclimates (Garvey et al. 2019). Because campus climate research (the campus being one "space") has predominantly focused around the entangled LGBTQ community, where LGBQ narratives are dominant (this group being a second "space"), the creation of a third "space", one that is exclusively for transgender students and separate from both of these existing spaces, can help the students to disentangle themselves from these preexisting narratives and form their own connections and identities. The concept of kinship networks has also been used to describe the ways in which transgender students band together as a form of resilience (Nicolazzo 2017). Overall, climate and microclimates have been shown to be a potent force that can act both positively and negatively on transgender students.

Curriculum and instruction remains a topic of discussion as it relates to transgender issues, though it is far less prominent of a topic of study than climate or microclimates. Research in this archetype often focuses very simply on how curriculum can either be modified to be inclusive of transgender topics or how subjects can be taught in a form that is condusive to the

learning of transgender students. This covers a wide range of subjects, though it often tends to be broader in focus; research ranges from topics such as managing to recruit transgender students into higher education and having them stay there (Newhouse 2013) to the effects of increased resources available to transgender students (Greytak, Kosciw and Boesen 2013). Given that microclimates have been proven to be important, one would expect that the curriculum and instructional strategies found in the microclimates of different majors would have an impact on student outcomes; however, this has not been well studied. Overall, curriculum and instruction remains a topic of study for transgender students, but it is often talked about in such broad terms that it can be challenging to pin down exactly what best practices might be to support these students.

College Major Choice and Gender

The choice of a college major often ends up being a defining moment in a student's life. While it is not uncommon for students to change majors, the major that a student ends up in may dictate the course of not just their academic career but their future in general. As this study is framed through the concepts of climates and microclimates, the particular microclimate that is college majors is the most important one to consider. Much study had been done on major choice as it relates to race, ethnicity, culture of the major, and more. Here we will focus on discussing major choice as it has been studied in relation to gender. An understanding of how gender impacts major choice, will allow us to examine the intersection of gender and the microclimates of different majors on a college campus.

The majority of the research that has been done in this area assumes a binary conception of gender and assumes that gender is inherent rather than a social construct. The fact that much of the existing research exists within these binary conceptions of gender, as well as the fact that

gender is often treated as inherent and not as a social construct, represent two key critiques of this research that limit both its value and validity.

Research as it relates to gender and major choice has evolved over time. Historically, research within this particular field focused on issues such as student capacity and prior achievement as potential explanations for variation and disparities in major choice between genders. Recent efforts have mostly disregarded and/or disproven these theories; indeed, modern day research has largely disproven the idea that differential ability or prior achievement between genders can explain differences in major choice (Riegle-Crumb et. al. 2012). Recent efforts have also called for gender to be reconsidered as a concept. Even research within the binary in modern times has started to discuss gender as a social construct (e.g. Irvin 2017) or call for examining social structures as they relate to gender (e.g. Riegle-Crumb et. al. 2017). However, while there have been calls for research within this field to reform these standards, there has yet to be much movement in that direction.

Students of different genders major in different fields at different rates. In much of the currently extant research literature, this is discussed as a difference between the number of men and women majoring in different fields. For instance, on average about three times as many men major in STEM departments than women, and many more women major in humanities departments than men (Moakler and Kim 2014). These gender differences (sometimes referred to as a "gender gap") are of concern to many due to the apparent exclusion of people of certain identities from various fields, including some that are often associated with higher-paying jobs. This literature review focuses on examining current (defined for this purpose as less than twenty years old) research on gender and college major choice. Much of the recent research within this field discusses the gender gap and major choice under one of two broad categories: major choice

and disparities as based on internal logic systems, or major choice and disparities as a product of external social circumstances and relationships.

Major Choice and the Gender Gap as Products of Internal Processes

A large portion of the current research on college major choice and the gender gap therein attributes this gap to students' internal cognitive and emotional processes. Such models largely neglect the role of external forces and climates in student major decisions, instead discussing the psychological processes through which students choose majors. A common theme among these papers is that their findings do not fully explain the observed gender disparities among college majors. They often then call for further research on what other factors might be in play, both internally and externally.

One explanation proposed under the umbrella of internal student processes discusses issues of student awareness of curricular programs (Baker and Orona 2020). The idea behind this theory is that some students may not be aware of some curricular programs due to differences in prior knowledge of programs that are, normally, not common in high school settings (e.g. sociology, film and media studies) and that these differences in awareness can explain differences in student major choice. Baker and Orona (2020) conducted a study on the majors that students considered versus the majors that students were aware of, and used various models to determine differences between these two sets between different racial and gender groupings. Their study found significant differences between genders (as well as between racial groups) in terms of both sets. This supports the idea that differential awareness of programs between genders might factor into the gender gap in student enrollment in different majors; however, they also find that their findings do not account for all of the gender gap on their own.

Another explanation proposed under the umbrella of internal logic is stereotyping. The idea that some majors are stereotyped as one gender or another has been used to explain gender differences. In particular, this theory is often discussed in relation to STEM, which is such a male-dominated field that it may be difficult to observe the presence of women within STEM. Studies such as the one carried out by Dunlap and Barth (2019) examine these stereotypes between groups of students, often using "Female Dominated Majors" as comparison groups to STEM in order to examine how these stereotypes might affect student enrollment. While many of these studies face issues of causality in determining whether major choice leads to stereotypes or whether stereotypes lead to major choice, the outcomes demonstrate a link between these two variables (Dunlap & Barth 2019). Once again, however, this fails to encompass the entirety of the observed gender gap.

Another proposed explanation for the gender gap is the impact of masculinity/femininity on choice. Research in this vein argues that, while masculinity and femininity are not inherent to different genders themselves, the quantity of masculinity and/or femininity that a person has internally (typically measured in this research using the BSRI test) can strongly impact their choices and the paths that they take. Research of this kind has argued that the gender gap in major choice can be explained in part by the shifts in masculinity and/or femininity that one must make in order to be a part of certain fields. Individuals may find it undesirable to choose majors that depart from one's gender or adjust one's current state of masculinity and femininity (Simon, Wagner, and Killion 2017). STEM majors generally score lower on femininity scales, and thus it is posited that more feminine individuals would likely not want to join these majors which might require them to lessen their femininity/gain masculinity (Simon et al. 2017). This concept has also been associated with utility value, the idea of internal psychological assessments of how

“useful" certain majors are to students’ future plans and/or personal beliefs being a determiner of the choices they make with regards to major choice. In this examination, students with stronger utility value beliefs tended towards greater masculinity and STEM majors (Lackland, Childers, and De Lisi 2001). While these papers have slightly broader definitions of gender as a concept, they still often do not discuss the external circumstances that might dictate why certain fields trend the way that they do in terms of their students’ average masculinity/femininity. They also tend to find that they still cannot account for all of the observed gender differences in different fields.

The final and perhaps most common explanation of an internal process difference is the different logic and priorities of male and female students. Various studies have found that, for instance, male students have a greater concern for monetary issues than their female peers (Zafar 2013) and greater preference for majors with evident pathways to financially secure jobs (Quadlin 2020). Studies of this type attribute the gender gap primarily to these differences in inherent, gendered logic as well as inherent, gendered preferences. A weakness worth noting in these types of studies in particular is that they often do not critically examine why this apparent “gendered logic” and related phenomena might exist, and often do not discuss the gender gap as a solvable issue. Finally, like most other theories under this particular category, explanations of this type often are not found to entirely explain the apparent gender gap.

Major Choice and the Gender Gap as Products of External Circumstances

While much of the recent research on major choice focuses on internal psychology, some of it focuses instead on the external circumstances surrounding a student while in higher education. This is the category under which climate research falls within discussions of major choice; however, climate research is not the only type of research found within this broad

category. This category can encompass many levels of social interaction, ranging from a student's group of friends to college campus culture as a whole, with interactions with different categories of climates showing different effects. Generally, research in external areas focuses less on finding one particular reason for gender differences in major fields, and more on identifying various contributing factors, with less concern about effect size. This is in part due to research of this type coming more out of sociological and anthropological frameworks, while research on internal effects is more psychologically based. Research in this area often views gender as a social construct rather than as an inherent phenomenon, but often still falls into the trap of restricting gender to a binary and not considering students that do not fall into traditional definitions of masculinity or femininity. While more external-focused approaches seem to hold up better to current critical standards, however, the lack of concern for effect size may mean that one could never truly understand all of what creates these gender differences, though one can also argue that a complete understanding is often less important to researchers in these areas than studying smaller groups of people with the idea that no single truth can unify all lived experiences.

One proposed reason for gender differences in major choice that falls under the category of being more externally focused is the idea of social reproduction. While some research argues that ambient social pressures drive students towards fields that align with historical expectations of those of their identities, other research has argued that explicit desire for social reproduction of gendered expectations can play a part in the gender differences in major choice. Both of these factors are typically considered under the umbrella of social reproduction. Studies have suggested that students of different genders may experience familial and cultural pressures differently, and particularly that male students often consider some of these pressures more

strongly than female students when making decisions about majors (Mullen 2013). This was linked to the use of choice of major as a form of choosing a social identity, with men being more concerned about prestige and women being more concerned about other factors such as home life (Mullen 2013). Interestingly, this effect was found to be moderated by social class, wherein this trend was shown far more strongly within privileged, upper-class students when compared to their lower-SES peers (Mullen 2013). This suggests that family social background might also have a stronger role than is immediately apparent for students when choosing a college major. This also demonstrates that the idea of major choice is more complex than simply picking a subject– what exactly this choice means to a student can vary greatly, and a student's interpretation of the meaning of this choice can have a strong impact on the selection process (Mullen 2013). All of these effects considered, we come back to the idea that social reproduction as an explicit influence, whether a student intends to reproduce their status or not reproduce their status, is a factor in the process of major choice.

Another example of an external or socially constructed aspect of gendered major choice, touched upon briefly in the last paragraph, is major choice as a form of social identity. Majors have been historically gendered and placed into hierarchies for so long that selecting a major in and of itself can be construed by students as ascribing an identity to themselves (Mullen 2013). These identities are also not particularly fluid, with a student often feeling like they must assume a rigid role in order to assimilate into different majors (Kim, Sinatra, and Seyranian 2018). One way of understanding this self-assignment of social identity is that students are attempting to integrate an existing identity into a system around them. Students that try to maintain pre-existing and fairly rigid identities relating to gender and subject field often find it difficult, especially women in male-dominated fields, as there are unsubtle signals pushing them out, even

from young ages (Kim et al. 2018). Even at more advanced levels, more subtle forms of discrimination and exclusion can push out women that are not of a particular, more "acceptable" to the established form of womanhood. A second, related way, of understanding social identity is through examining the assimilation process through which students mold their identities into more conformist forms for their fields. For instance, it has been established that only a very narrow definition of womanhood is considered "acceptable" enough to be left unchallenged in male dominated fields (Kim et al. 2018). While the literature does not tend to consider how other gender identities might be impacted by this phenomenon, it is easy to see how different societal expectations can force conformity and strict performance. All of this shows how the external identity expectations of the culture in which students immerse themselves in certain majors can make it difficult to discern what is truly "internal" to a student, or sometimes even overpower internal identity. In short, the need for women (and gender minorities) to assimilate into very specific forms of social identity framed by a particular major often requires enough emotional work on the part of students that students who either do not or cannot conform leave, creating a gender gap in some fields.

A final example of an external factor in the choice of students' major is a form of "demographic homogeneity," as it is occasionally referred to– or, as it is more commonly referred to, a "role model effect." In major choice, this theory suggests that faculty members with certain important identities (in this case, gender identities, such as woman faculty members) attract students with shared identities into both their classes and their major. This phenomenon has been proven time and time again, and not just with gender identities; it has also been proven with racial identities, ethnic identities, sexualities, and even disability (e.g. Rask and Bailey 2002, Kim et al. 2018). While the existence of this identification effect has been proven

repeatedly, and while it has also been repeatedly been found to be a strong effect in comparison to some of the others that have been discussed, the "why" of this phenomenon is significantly less studied. Beyond the evident reasoning of forms of kinship and support, there does not appear to be much study on what makes this effect as strong as it is, other than occasionally supposition that shared identity in itself is likely a strong psychological impact. Still, the effect is fascinating and powerful as a tool for increasing student engagement in different fields, and also serves as a very easy explanation for some of the gender gaps that are seen in some fields today. After all, with most faculty for a long time (and even today) being cisgender white men, there is not a lot of representation or a lot of role models for students that do not fit that specific mold. This effect also feeds back into itself, with a lack of role models leading to a lack of accomplished enough individuals to serve as role models, which helps to explain the slow-to-change nature of gender differences. When there are not many role models for students that are not cisgender white men, it is easy to see how strong gender gaps can be created and continually propagated.

Summary & Conclusion

While most research on gender and major choice still examines the effect of gender on major choice as an internal phenomenon, other research has been slowly emerging over time to challenge this and demonstrate how externally-based, socially constructed phenomena can also play a part in creating gender differences. There is also an evident need to consider both internal and external factors at once when discussing how gender impacts major choice. Internally based explanations rarely explain all of what is occurring, and externally based explanations rarely even portend to understand most of what drives these decisions. As a pair, however, externally based phenomena are often excellent complements to internally based phenomena, and can help fill in some of the gaps.

In general, however, a lot of research on major choice must be revisited for several reasons. For one, some of the methods in papers in this area of study are lacking or even outdated, because they use old conceptions of sex roles as measurements of gender. Second, as is evident with the aforementioned examples, much of the research that has been conducted as it relates to gender and major choice is focused on "men" and "women." While there is evident need to examine men and women in research, the means through which these studies examine gender within that gender binary means that much of the existing research on gender and major choice is, at best, not applicable to many transgender people, and at worst outdated due to the use of archaic gender roles, terms, and the lack of acknowledgement of the diversity of gender identities even within the two categories of "men" and "women." This research therefore excludes a large number of people of an identity that is becoming increasingly socially visible. Thus research on major choice and gender that incorporates more complex understandings of gender as a concept is required.

Relation to the Current Study

With this understanding of the current state of the study of major choice as a result of gender, and the flaws therein, the question emerges: how might the study of transgender people either affirm or challenge the narratives that emerge in the current literature, and what might this mean for the study of gender and major choice as a whole? Due to the nature of transgender identity as a difference in the social perception of a person's gender at birth and their identity at the current moment, it is not necessarily possible to address internally based phenomena without it first being generally accepted that gender and sex are not innate traits with a distinct biological impact on one's mind, which is far beyond the scope of this paper to prove. The only possible internal effect that could be adequately addressed would be whether transgender identity might

influence a person towards choosing a field which studies transgender identity itself; however, this is a comparatively narrow question to ask. Thus, the most important considerations in answering this question as we explore it will be in the category of external influences, and more specifically, in considering climates.

Transgender people challenge long held narratives of social reproduction and social identity in that transgender identity represents an explicit departure from social norms and expectations. By asserting oneself as a gender different from the identity as which broader society currently perceives them (or has historically perceived them), transgender people attempt to place themselves outside of the narratives of the gender as which they were socialized, thus outright attempting to deny many of the traits that they would normally be expected to take on or reproduce. This dissonance between a transgender person's socialization and their present social identity represents a challenge to many previously conceived notions of the interaction between gender as an identity and society. This discrepancy thus forces us to look closely at the climates within which a transgender person resides and these climates' interactions with their social identities. If factors such as socialization, social reproduction, and the development of social identity play as strongly into major choice as existing literature implies, then climate is likely to have a stronger impact on the newer gender identities of transgender people when compared to cisgender people due to their lack of socialization within their current identities. In other words, because transgender people come to their gender identities later in life than cisgender people do (who, by definition, are associated with their gender identities from birth), then they would not have the same level of rigidly set socialized expectations and would still be socializing into these identities, meaning that new environments can have a stronger impact on this socialization.

Methods

Researcher Positionality

I (the principal investigator) am a nonbinary transgender person that is also an undergraduate at the same institution as the participants of the study at the time of this research. I came out as transgender part way through college, and I have had mixed experiences with climates and microclimates at my institution since coming out. I am also white, which grants me racial privilege that allows me to navigate these climates in ways that transgender people of color may not be able to. I am positioned in such a way socially that I have interacted with a fair number of the out transgender students on campus, being friends with some and acquaintances with others. Knowing transgender students and being involved in that community, along with my personal mixed experiences across different departments, served as motivation to determine if there are any unifying factors that could serve to support transgender students across majors.

During my time as an undergraduate, I have also moved between different majors several times for varying reasons. With my interests having shifted between chemistry, biochemistry, biology, and eventually ending up with solely education as my major, I have seen several different departments at the college as well as how they support (or fail to support) transgender students. My reasoning for switching between majors was different every time, which has led me to be curious about what drives those decisions in general.

Theoretical Framework

This study draws on the earlier identified concepts of climates and microclimates. For the purposes of this study, climate was defined as the broader atmosphere of the college at which the study took place as a whole, and the interactions that students had with it. Smaller variations on this broader climates, such as major divisions, majors, and classes, were all considered as

microclimates. In considering which metrics to use to measure climate and microclimate, it was decided that perceived climate and microclimate factors were more important than an objective measure for this analysis. I also decided to not attempt to use some of the objective measures of available resources and victimization rates so as to avoid feeding into the deficit narrative that often dominates discussions of LGBTQ students, and instead focused on narratives of resilience that students offered about how they managed to thrive in the climates in which they found themselves.

Study Design

This study aimed to examine the experiences of transgender students in higher education, using the experiences of LGBQ college students to contextualize these findings. The LGBQ students were also used as a control group in order to ensure that any effects shown by the transgender participants were as a result of transgender identity rather than potentially being related to romantic or sexual orientation. The primary goal was to examine students' experiences within majors and how this relates to choice of major. In order to approach this broad question, I created three specific research questions:

1. Do transgender college students show differential participation in different majors/fields, and if so, what does the distribution look like?
2. What factors most affect transgender participation in a class or field?
3. What techniques/practices are useful for increasing the engagement of transgender students with a class or field?

In order to answer these questions, there were two primary components to this study: a survey directed at LGBTQ students as a whole and semistructured interviews conducted with transgender students.

The survey was designed in order to determine the distribution of LGBTQ students within different divisions of the college as well as across majors. It also asked about students' opinions on their majors, and the facets that they particularly appreciate or do not appreciate, including general department climate, class content, peer interactions, student-professor interactions, and several others. Finally, it also asked about whether students had changed their major since their freshman year, and what factors influenced that decision if they had. The survey was designed as well as published on the survey platform Qualtrics, which allows for anonymous responses to be collected. The survey was also used for the recruitment of students to the interview portion of the study, which collected student emails in a separate list from the other survey responses so as to maintain anonymity. There were 53 respondents in total. The survey questions can be found in Appendix A.

Semistructured interviews were conducted with five transgender students who volunteered after completing the initial survey. Questions in the semistructured interviews were designed to get a broader understanding of the student's experiences at college, as well as particular experiences within their major(s). The outline of questions for these interviews can be found in Appendix B. Demographic information for the participants in these interviews may be found in Table 1.

Table 1

Interview Participant Demographic Information

Name (Pseudonym)	Pronouns	Gender Identity	Romantic/Sexual Identity	Major(s)
Vonya	they/them	Trans &	Pan/Bi/Lesbian/	Computer

		Nonbinary	???[a]	Science
Chard	they/them	Queer/ Nonbinary	Bisexual/ Pansexual	Astrophysics
Sev	they/them	Nonbinary	Queer	Psychology and Math
Evan	he/they	Transmasculine	Aromantic Asexual/???[a]	Educational Studies/ Linguistics
Avery	he/they	Transmasculine Nonbinary	Asexual	Biology

[a] ??? is used to denote that a participant expressed uncertainty over the related identity.

Data Analysis

Survey data was analyzed for distribution and general trends using the functions available within Qualtrics. Survey data for distribution of student majors was then recoded according to major division(s) (defined as one of the three divisions of the college at which the study was conducted, including Natural Sciences and Engineering, Social Sciences, and Humanities). Students with double majors (the greatest amount permitted at the school at which the study took place) were accounted for as two separate major entries with the same demographic data. This same process of splitting survey data for students with double majors and assigning the same demographic information to it was applied to the sections within the survey pertaining to student satisfaction. Recoded data was then analyzed using the statistical analysis platform Statistical

Package for the Social Sciences (SPSS) and statistical tests were conducted to determine if there were significant differences in these distributions between different identity groups.

Interview data was first transcribed for analysis. In order to determine trends, an initial analysis was conducted by pulling out themes from each student's responses and then comparing them against other students to see if there were any commonalities. Once commonalities (a theme found in three or more responses) were found, each of the transcripts was then analyzed a second time to mark off any quotes relating to the major themes identified. These themes were then consolidated (where appropriate) and annotated with quotes and qualifiers before finally being collected into the results section.

Study Limitations

The implementation of this study, as well as the sample that was collected, imposes a few notable limitations on the study. One example of a limitation that may have impacted the results of this study is that there were no students of color that volunteered to be interviewed. The lack of representation of non-White students may mean that some of the experiences shared by students in the interview portion of the study may not resonate with those of transgender students of color. Another limiting factor of this study was the means of recruitment for the survey, which was done through Facebook so as to have access to the most current students through a virtual medium. This may generate a form of nonresponse bias in that Facebook is more often used by students that are "out." This is especially true for transgender students, some of whom may not use Facebook if they must look at their deadnames when they choose to use it. Additionally, this study was conducted at a left-leaning small liberal arts college, which would certainly have different environmental pressures and circumstances than other types of colleges and universities. A final limitation of the study is that all of the study was conducted through a virtual

medium in the midst of a pandemic, which likely limited the number of students that responded to the survey as well as the number of students that volunteered to be interviewed. However, many of the themes that emerged in the results section are broad enough that they are unlikely to be drastically impacted by these biases. Additionally, most of these limitations would be expected to produce a positive bias in the results (i.e. highlight more positive student experiences than may be typical), and given that the results do not generally point towards positive outcomes even with the existing group, it is likely that this impact would not skew the results in a direction to which they do not already point.

Results

Survey Results

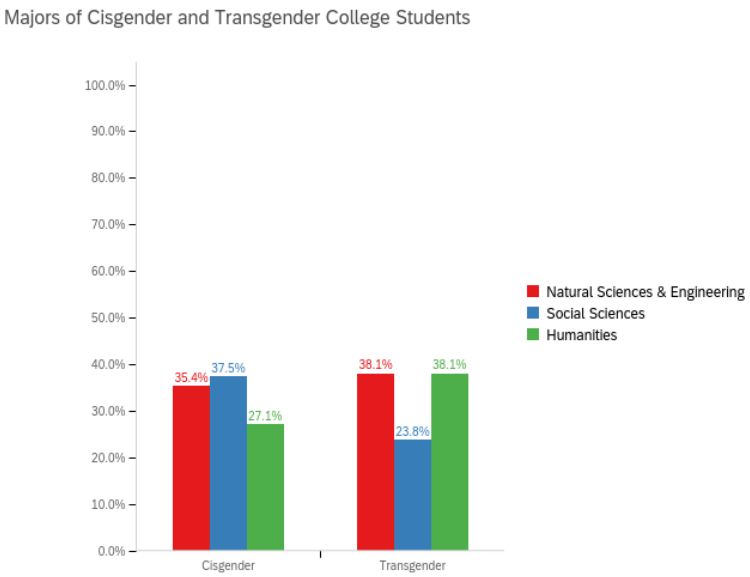
In order to determine general trends concerning major choice amongst LGBTQ students at the college at which the study took place, a survey composed of questions asking about major and experience within major was distributed to students identifying as LGBTQ (Appendix A). The results of the survey were split into groups dependent on whether the respondent was cisgender or transgender, and then analyzed to determine whether there were significant differences between these groups. Overall, there were no significant differences between cisgender and transgender students in most of the variables studied, with one notable exception concerning the satisfaction of students with course content in their majors. These results, while initially surprising, were qualified and expanded on using the interview data.

Distribution of Students Across Majors

An analysis was performed on the survey responses to determine whether there was a difference in the distribution of students across the three divisions of majors at the college in which the study took place depending on whether the participant was cisgender or transgender. Student responses were first divided into groups depending on whether the participant self-identified as cisgender or transgender. If a student had multiple majors in different divisions, then they were counted for both divisions. The distribution of the divisions of student majors can be found in Figure 1.

Figure 1

Percentage distribution of student majors across the three divisions of the college, separated by whether the participant was cisgender or transgender.



A Pearson chi-square test was performed in order to determine whether there was a significant difference in this distribution, which there was not ($\chi^2(1,N = 69) = 1.43$, $p = .489$).

Changes of Major

An analysis was performed on the survey responses to determine whether there was a difference in whether students had changed majors during their time in college dependent on whether the participant was cisgender or transgender. Student responses were first divided into groups depending on whether the participant self-identified as cisgender or transgender. A Pearson chi-square test was performed in order to determine whether there was a significant difference in this distribution, which there was not ($\chi^2(1,N = 41 = 3.27$, $p = .070$).

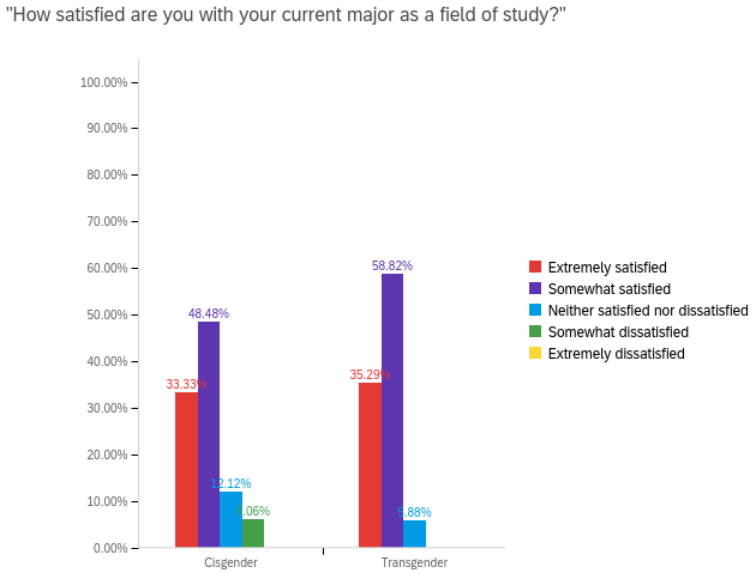
Satisfaction with Major Field

An analysis was performed on the survey responses to determine whether there was a difference in student satisfaction with their major as a field dependent on whether the participant

was cisgender or transgender. Student responses were first divided into groups depending on whether the participant self-identified as cisgender or transgender. The distribution of the responses to this question can be found in Figure 2.

Figure 2

Percentage distribution of responses to the question "How satisfied are you with your current major as a field of study?", separated by whether the participant was cisgender or transgender.



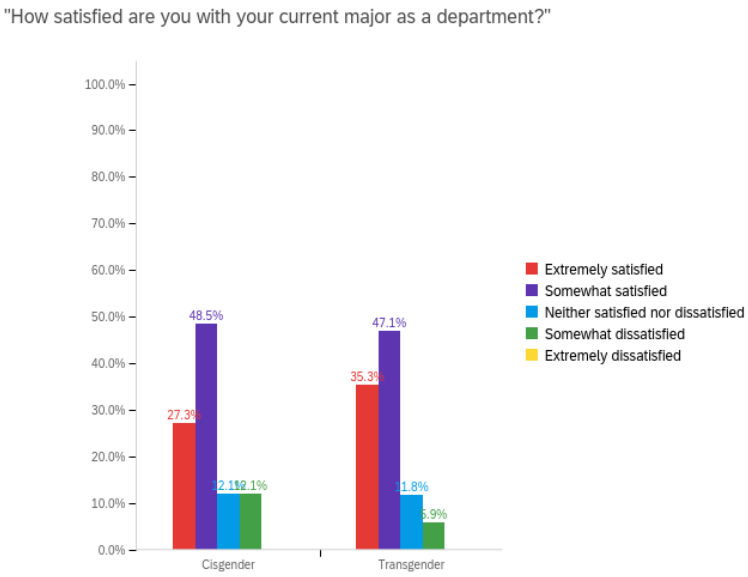
An independent-samples t-test was performed in order to determine whether there was a significant difference in this distribution, which there was not ($t(67) = 1.0$, $p = 0.323$).

Satisfaction with Major Department

An analysis was performed on the survey responses to determine whether there was a difference in student satisfaction with their major as a department at the college at which the study took place dependent on whether the participant was cisgender or transgender. Student responses were first divided into groups depending on whether the participant self-identified as cisgender or transgender. The distribution of the responses to this question can be found in Figure 3.

Figure 3

Percentage distribution of responses to the question "How satisfied are you with your current major as a department?", separated by whether the participant was cisgender or transgender.



An independent-samples t-test was performed in order to determine whether there was a significant difference in this distribution, which there was not ($t(67) = .17$, $p = 0.869$).

Satisfaction with Different Components of Major

Analyses were performed on the survey responses to determine whether there were significant differences in student satisfaction with several aspects of their major (including class content, workload, teaching, interactions with professors, and interactions with students) dependent on whether the participant was cisgender or transgender. Student responses were first divided into groups depending on whether the participant self-identified as cisgender or transgender. A series of independent-samples t-tests was then performed on each of these five

categories to determine whether there was a significant difference in the distributions. The results of these analyses can be found in Table 2.

Table 2

Independent-samples t-test results for satisfaction with the five components surveyed

	df	*t*	*p* value
Class content	67	2.02	.047
Workload	67	0.75	.456
Teaching	67	0.14	.886
Interactions with professors	67	0.52	.602
Interactions with students	67	0.52	.606

Table 2 shows no significant differences in the distribution for satisfaction with workload, teaching, interactions with professors, or interactions with students. It does, however, show a significant difference in the distribution for satisfaction with general class content (unrelated to identity).

Overall, survey data showed no significant differences between cisgender and transgender students in many of the variables studied. However, satisfaction with class content did demonstrate a significant difference. The survey provided useful demographic information and frameworks through which to consider the question of student experiences; however, due to the cursory nature of the survey's examinations of student experience, more detailed information was required to make sense of these findings and elaborate upon them. Thus, the survey was used to help refine questions for the interview portion of the research.

Interview Results

In order to explore some of the issues outlined in the research questions, interviews were conducted with five transgender students at the college at which the study took place. These interviews aimed to allow for a more detailed and nuanced understanding of the perspectives of these students, and how these perspectives influenced their decisions. These interviews compliment the data obtained from the surveys, allowing for explanations of some of the results from the surveys to be explained and elaborated on.

The interviews conducted with Vonya, Chard, Avery, Sev, and Evan[1] contained a large amount of information about each of the students' individual thoughts, struggles, and practices of resilience in moving through the educational system. While each was unique in many different ways, the interviews showed several notable trends, including the salience of transgender identity, a lack of explicit inclusion inside of majors, and a tendency to choose majors based on content rather than based on culture and inclusivity.

The Salience of Transgender Identity

Despite the apparent lack of impact of LGBTQ identity on students' choice of major, the strongest common theme among interview participants was the salience of transgender identities to everyday life. Evan summarized this in his answer to the question of how important these identities are to daily life.

> Um, pretty darn important, I would say. Uh huh. Yeah, I think I have to think about, um, both the social side of things and the more personal, you know, 'How am I in my body?', 'What does that mean' a lot. Just in order to, like, function comfortably, and those are things that, like, are sort of fused with every aspect of just existing. So, um, pretty important.

[1] Names used here are anonymized. Identifying information has been changed.

(Evan, February 22, 2021)

Other participants echoed similar themes, with many participants bringing up in particular the necessity of considering and often disclosing transgender identity in order to have their pronouns respected.

> Difficult? Not to be [open], uh, to be honest, if I want to get gendered correctly…
>
> (Vonya, December 4, 2020)

Several also discussed at various points how being transgender impacted their relationships with students and faculty, as well as how they selected friends (points which we will return to), and how this identity could end up framing all of their relationships.

Interestingly, transgender identity was shown to be far more salient as an identity than romantic or sexual orientation. When asked questions relating to both of these topics, participants tended to talk much more about gender identity than about romantic/sexual orientation, with some doing this by accident and others acknowledging it directly. Take, for example, the following portions of the responses of Chard and Evan when asked about their experiences with being open with gender and sexual identities at the college at which the study took place.

> Let’s see. I think I'm going to talk specifically about gender and then you can ask more questions about sexual elements, but they're sort of different.
>
> (Chard, December 7, 2020)

> So I was always connected sort of to the [transgender] community from the outset of being here and that has continued and been a great source of support, um, as well as just

> because of like coming out and stuff during my time here, I I've had to sort of tell the professors and, and stuff like that.
>
> (Evan, February 22, 2021)

Chard directly acknowledged their tendency towards talking more about gender (and did not return to the subject of sexuality), while Evan immediately and exclusively launched into discussing his connection with the transgender community at the college instead of discussing sexual identity at all, both of which demonstrate the trend towards considering gender identity more than sexual identity. The only exception to this that was demonstrated among the participants was with Avery, who discussed how their asexuality was a salient identity when navigating the college campus, in particular discussing how they dropped a queer media class when it focused too heavily on sexual content.

> [Gender and sexual identities] definitely play quite a role. I mean, being ace comes up. Well, I don't necessarily talk about it. It does affect my view of the world as very different than a lot of my peers.
>
> (Avery, February 25, 2021)

Even for Avery, however, gender identity was much more of a salient factor, as evidenced by their shrug and uncaring attitude when asked to describe their sexuality.

> ...I'm ace. Don't know more than that about sexuality stuff. Who knows?
>
> (Avery, February 25, 2021)

Overall, participants acknowledged transgender identity as a factor that influences much if not all of their lives, and as an identity that rose far above others in terms of its salience and relevance to everyday life.

Not Excluded, but Not Supported

Another common theme among participants' responses was the idea that, while each of their majors was not an outright hostile environment towards them, their identities were not supported and respected within their majors. This trend emerged from all of the participants, meaning that this effect spanned across many majors as well as each of the divisions at the college at which the study took place. When asked about how easy or difficult it was for them to have their identity respected at the college, Sev's first response was to make a face before stating, "They try? I know they try… Even when they're trying, they don't know, they don't know how to deal with it." This sentiment of people trying but failing was echoed among participants, in particular relating to the use of they/them pronouns. Participants were often careful to acknowledge that students and professors alike tried to get their pronouns correct and respect their identity…

> I mean, professors try and get my pronouns.
>
> (Avery, February 25, 2021)

> They, you know, wanted to do their best.
>
> (Evan, February 22, 2021)

> I think that the nice thing about [college] is that everyone at least is familiar with the concept of pronouns, which is not something that you can take for granted in other places.
>
> (Chard, December 7, 2020)

…But they were often equally willing to acknowledge just how much people failed at doing so.

> There have definitely been issues, not egregious ones, um, with pronouns, but definitely cases where professors will misgender me and then very publicly apologize profusely, which was always very awkward.
>
> (Avery, February 25, 2021)

> It was not pleasant a lot of the time... like the professors would know, and then they would just use only my name because they just like, couldn't quite wrap their... brains around it.
>
> (Evan, February 22, 2021)

> That said, there's still, there's still, like, a wide variety of whether people actually use them correctly.
>
> (Chard, December 7, 2020)

Chard even stated that they had largely given up on correcting people about their pronouns, as they felt it was no longer worth their effort to do so.

Participants' feelings about having their identity supported and being gendered correctly differed depending on gender identity, and in particular, depending on what pronouns the participant used. The two participants that used he/they pronouns (as opposed to the rest, who all used they/them) both acknowledged feeling more supported and being gendered correctly on more occasions. Both of them acknowledged this difference themselves at different points in their interviews.

> [Being misgendered] got a lot better when I started using he/they, which, lucky me, that worked for me.
>
> (Evan, February 22, 2021)

> My pronouns change slightly depending on who I'm talking to, because trying to get old people to use they/them is generally not a good strategy.
>
> (Avery, February 25, 2021)

Even among students with transgender identities, it is evident that there is variation in how much students feel supported in their majors. While four of the five students interviewed had an academic division in common, they all had very different impressions of their majors. Avery, for example, had an almost entirely positive impression of his major while Vonya had a mixed or even negative impression of theirs, in part due to differential support for transgender identities (as discussed above) and in part due to factors such as course availability (discussed later). The interaction of different transgender identities with the overall impressions that students have of their majors suggests that, perhaps even beyond what we were able to observe from the set of students that were willing to be interviewed, transgender experience likely varies greatly even inside of the broad umbrella of "transgender." Overall, however, participants acknowledged a general lack of actual support for transgender students and their identities within their majors and within the college as a whole.

Material, Not Means

The survey results suggested that students were generally satisfied with their majors and that few had changed majors or expected them to do more to support their identities. While students did remain in their majors despite a perceived lack of support, the interviews explained this discrepancy. Each of the participants demonstrated a very high level of interest in their fields of study, such that despite the setbacks in being forced to acquire the knowledge through less than ideal means they persevered out of interest. When asked about their least favorite parts of

their majors, both Vonya and Evan answered that they wanted to take more classes in their major than they were currently able to, which is a strong signifier of interest in their majors as a field.

> I really like computer science. I would like to take classes in the field... if I sign up for a CS class, then it's possible that I will get lotteried out of it. It's probable, even, for some classes, that I'll get lotteried out…
>
> (Vonya, December 4, 2020)

> Not being able to take more classes? I don't know if that counts as a bad thing.
>
> (Evan, February 22, 2021)

Sev discussed having issues choosing a major out of having too strong of an interest in too many fields, stating, “I have a lot of interests, so it was less that I didn't want to do Latin and more that I really wanted to do everything. Um, art, psychology, math, and Latin have all been up there… I could have triple majored. They just don’t allow it.” Chard and Avery both also spent a lot of time talking about their interest in their respective fields of study, with both of them even going so far as to say that they found their transgender identities less relevant within the context of their majors than elsewhere.

> I don't think my gender has that strongly affected my choices… it’s had very little to do with my bio interest.
>
> (Avery, February 25, 2021)

> [Gender and sexual identities] for me… they’re more, like, socially important.
>
> (Chard, December 7, 2020)

Throughout each of their interviews, the participants demonstrated signs of high levels of interest in their chosen fields, which seemed to push them towards persevering in their majors.

Networks of Support

Because students seemed to pursue majors out of intellectual interest, and did not seem to expect or find support for their identities, they turned elsewhere for that support. Finding this support through both friendships and organizations is central to the well-being of trans college students. The final common theme among the interview participants was that of networks of support that the participants each had outside of their majors. Throughout the interviews, all of the participants discussed the interactions that they had with other students outside of their academic majors as significant to how they navigated college. Sev and Avery both discussed how a student organization was important to them in both deciding to come to the college at which the study took place as well as being important to their college experience in general. When asked about the factors that drew them to the college, they both listed a club (or an event from a club) as motivating factors.

> So then I looked and the first thing I saw was [particular club event]. And I said, 'I am going to this college.'
>
> (Sev, December 5, 2020)

Notably, the club that Sev and Avery mentioned is not an organization devoted to transgender or even LGBTQ students– it is an interest club that just happens to have a large quantity of transgender/LGBTQ students in its membership. This suggests that groups designed for transgender students at the college may not be the ideal supportive environments that they would purport to be.

The theme of the importance of student organizations was echoed in other participants' responses. Chard discussed how events related to women plus in STEM were things that they particularly enjoyed going to.

> I really enjoy going to like women plus in STEM things where we talk about how it's shitty for women to be in STEM… if that was somehow incorporated into the curriculum, that would be kind of nice.
>
> (Chard, December 7, 2020)

These events were often organized by student organizations rather than by college departments at the college at which the study took place.

Even outside of student organizations, many participants discussed their friend groups as sources of relief. Many cited their friendships as something on which they could fall back to when they faced challenges elsewhere. Not all students had a group of friends who provided this support; Evan, for example, depended on individual friendships rather than groups. He said, " I don't tend to have, like, a friend group, I have disparate friends from different places" (Evan, February 22, 2021). However, Evan's descriptions of their connections with other students still suggest that connection is important to them (if not in the same group fashion as the other participants), and the other participants discussed group connection and connection in general in such a strong fashion that it is still mostly a point of commonality.

Conclusion

The trends of salience of transgender identity, lack of explicit inclusion inside of majors, and tendency to choose majors based on content show some very strong and very interesting unifiers among even the diverse group of people that were itnterviewed. The fact that these trends displayed so strongly among the participants despite the many different majors, gender identities, and circumstances of these five individuals suggests that these trends are far from coincidental. These trends indicate a narrative of broader systemic issues against which transgender students develop forms of resilience, which will be discussed in the next section.

Discussion and Conclusion

This research was performed in able to determine whether there was any difference in the distribution of majors between cisgender and transgender LGBTQ college students. It aimed to determine what factors might attract or deter students from pursuing different majors, and aimed to identify what strategies transgender students use to navigate their chosen majors. Quantitative results from a survey distributed to LGBTQ college students were complimented by analyses of interviews held with specifically transgender college studeents. These results, when examined in proximity to one another, demonstrate a narrative that reveals both the limited institutional support for transgender students in general as well as how these students use personal connections to help them navigate these complex educational systems.

The first notable result that was revealed through the analysis of the surveys was that there was no significant difference between the distribution of majors (as represented by division) of cisgender and transgender college students. This idea follows from what previous research on internal and external factors determining major choice would seem to imply. If internal processes (differences in psychological processes between different genders) govern major choice, as some previous research on gender and major choice would suggest, then we would have to see at least one of: differential awareness of majors (Baker and Orona 2020), differential interactions with stereotyping of majors (Dunlap and Barth 2019), differential proportions of masculinity and femininity (Simon, Wagner, and Killion 2017), or differential logic and/or preferences (e.g. Zafar 2013, Quadlin 2020). However, most of these factors are unlikely to be significantly different between cisgender and transgender populations. There is no reason to believe that cisgender and transgender students would be aware of different majors, as both groups are themselves a mix of other identity populations that could have different levels of

awareness with similar enough proportions that the end result is likely to be similar in both groups. For instance, while social class has been proven to have an impact on this awareness, there is a relatively even mix of social classes among both cisgender and transgender populations, and thus there would be no relative difference based on social class. Because transgender identities co-exist alongside other identities that are likely to be more relevant to a person's psychological and social development at an early stage, and because these other identities have similar proportions between cisgender and transgender populations, it is unlikely that there would be a noticeable difference between these populations. Similarly, also as a result of this type of mixing of other identity groups, interactions with stereotypes, proportions of masculinity and femininity, and differential logic are also unlikely to come into play. The only possible exception to this idea would be if there are stereotypes or preferences based specifically on being transgender, a question which research has yet to answer and is part of what this research itself addresses. As we will discuss below, while these preferences may exist, they are unlikely to factor strongly into students' internal processes.

If internal processes then work out to be unlikely to have an impact on LGBTQ major choice, then, we must also ask the same of external circumstances. Among the factors that have been considered under this category, we will revisit the ideas of social reproduction (Mullen 2013) and the role model effect (e.g. Rask and Bailey 2002, Kim et al. 2018). Social reproduction is very unlikely to factor into play in the circumstance of gender identity, as cisgender and transgender as categories simply have not been inside of public awareness for long enough for each of them to develop as social identities that could be reproduced in the manner that is typically discussed under the concept of social reproduction. If social reproduction is based on the idea that people are socialized into a society to perform certain roles, and are

conditioned so as to continue to perform those roles, then transgender people's contrast between their early socialization and their current social identities makes it unlikely that they would reproduce the identity into which they were first socialized. Additionally, because it takes time to socialize an identity, and because learning occurs much faster in young children, it is unlikely that they will unintentionally reproduce the expectations of the newer social identity. The role model effect is also unlikely to come into play for the simple reason that there are very few transgender professors or people in leadership positions for this effect to occur. Thus, we can see that unless there are specific circumstances relating to the treatment of transgender students that differ between majors, research suggests that there would be no difference in the proportions of students in each major, as we found here. As we will discuss later, it turns out that such a difference does not exist.

The second notable result we discovered in our research was the incredibly high salience of transgender identity regardless of major. In interviews, this was the strongest connection across all of the students interviewed, and came up multiple times inside of each interview. This also makes sense in light of prior research, given that in the past LGBQ students have demonstrated high levels of identity salience for those identities (Lee & LaDousa 2015). What is new from this study, however, is that transgender students find their gender identities to generally be more salient than their romantic and sexual identities, as evidenced by transgender students strongly favoring discussing transgender identities over romantic or sexual identities. This would imply a very strong degree of salience for transgender identities, as LGBQ identity was already shown to have a very strong impact on several aspects of a student's college experience (Lee & LaDousa 2015) and these identities were almost ignored when compared to the salience of transgender identity. This might seem logical given the lower visibility and acceptance of

transgender identities in broader society, and the greater frequency with which gender identity is relevant compared to romantic and sexual identity (with the one being a constant and personal question, and the other being relevant only in relationships). However, this strong salience also leads to an important question: if transgender identity is so incredibly salient to the point where it pervades nearly every aspect of a transgender student's life, then why is there no difference between cisgender and transgender students' major choices? The results of this study point to two factors working in tandem.

First, the most significant reason that transgender identity does not influence major choice is constancy between the microclimates of the majors. In this study, the macroclimate of the institution pervades each of the microclimates it contains and eclipses minor differences found therein. Before the study began, it was hypothesized that there would be differences in how transgender students were supported or respected between majors which would impact students' decision making and experience. The results of this study demonstrate that this is untrue; regardless of major, the support for transgender students is approximately the same. In fact, the results demonstrate that the widespread lack of support for transgender students in the larger campus climate is reproduced within each major. With each of the students interviewed reporting widespread misgendering and a general lack of support for transgender students (as well as similar ideas being echoed in several of the survey responses), it has become evident that this widespread lack of support creates an environment wherein transgender identity is not able to act as a factor in decision making. In other words, transgender students do not pick a major because of better support for transgender students because there is no "good" option. This is significant in a number of ways, as it indicates that not only are the individual microclimates of each major at least partially hostile to transgender students, but that the sum total of these

microclimates infers a broader school climate that would be similarly hostile. As discussed in the literature review, perceptions of climate have been linked to a number of adverse effects, including but not limited to: perceived safety (Toomey et al. 2012), worse academic outcomes (Newhouse 2013), and a generally more negative student experience as a whole (Siegel 2019, Kosciw et al. 2013). Overall, it is evident that the general lack of support for transgender students in every major makes transgender identity far less of a factor in major choice. However, one could still argue that more minor differences in majors, such as which majors consider gender and sexuality as topics, would likely still have some impact. What, then, could serve to nullify this effect?

The second reason for the lack of difference in distribution is that transgender students at this institution care more about major content than they do about gender identity when choosing and staying with a major. In the survey, among the variables studied, transgender students consistently rated their enjoyment of the class content of their majors higher than their cisgender peers. This demonstrates somewhat of a bias towards class content in comparison to other variables inside of a major by transgender students. When combined with the interview data, it was revealed that transgender students have a strong concern for what they are learning, even compared to cisgender students. The interest that transgender students have in the fields that they choose to pursue helps to explain why students might persevere in a major regardless of the climate in relation to their gender identity. When transgender students face adversity regardless of what major they choose, they focus instead on learning what appeals to them, and persevere through the challenges they face in order to gain access to this knowledge. This remarkable perseverance does not come without some support, however.

The perseverance which allows transgender students to persist inside of their chosen majors despite adversity comes as a result of support from their relationships with others. These relationships can take many forms, ranging from identity-based clubs, to interest clubs, to friend groups. The types of relationships that these students discussed in their interviews echo the concept of the "kinship networks" that Nicolazzo (BOOK) discussed in hir book, with students banding together to support each other even when the systems around them might push them out. Notably, the college at which this study took place has historically had similar issues to that of the college Nicolazzo described, wherein LGBTQ-focused student groups historically excluded transgender students, forcing them to develop their own groups and networks. Interestingly, all of the groups that the students who were interviewed discussed are groups that are not run by the college. While one particular group that was discussed for women plus in STEM occasionally receives some administrative support, it is still run by students, and the general planning and organization of the club is left almost entirely in their hands. The other group that was discussed is run entirely without administrative input and is an interest club that, while it has many transgender students in it, is not an identity-focused club. While the college often failed to provide spaces for transgender students to thrive, students often found ways to create their own communities within which to build kinship and resilience (similar to that described in Revilla 2010). The students that were interviewed almost all discussed clubs as a source of comfort and/or enjoyment for them, and all of them discussed the support of their friends as important to their daily lives.

The results from this study display a narrative wherein transgender students face a lack of support in every major, which reflects the general macroclimate of the college, but manage to navigate through these challenges as a result of a determination to learn and through the support

of networks of their peers. The lack of a difference in the distribution of majors of cisgender and transgender students, despite the monumental salience of transgender identity, is easily explained through a lack of differences in support between different majors as well as a general passion and devotion to the fields to which transgender students devote themselves. This narrative leaves a lot of questions still to be explored, but already presents several important implications to be considered.

Implications for practice

There are several important implications to be considered that have been brought to light as a result of this research. Firstly, and certainly most importantly, there is a certain baseline of support that peeople have consistently failed to hit with regards to transgender students. This is visible both on micro levels, such as with individual departments, and on macro levels, as evidenced by each of these microclimates showing the same effect. Evidence suggests that there are widespread issues with misgendering, implicit exclusion, and even a general disregard for transgender issues, even at the very politically liberal college at which this study took place. At the current moment, minimum baselines of respect are not being met, and those must come first before any additional reforms can start to be put in place. While many of the baseline issues are difficult to tackle, likely the easiest of them to address is misgendering. There are many pronoun training programs that exist and do not take a long time (or an exorbitant amount of money) to run. While the effectiveness of diversity trainings in general is a hotly debated topic, pronoun trainings have been known to at minimum reduce the amount of misgendering that transgender people experience, which is a step in the right direction.

Another important implication is that the significant salience of transgender identity suggests that something must be done to support transgender students specifically. Because

college-sponsored affinity groups have a poor track record for the inclusion of transgender students, reforms are likely necessary to make sure that transgender students have the support they need. Reorganizing these affinity groups or creating new college-sponsored groups specifically for transgender students would be one possible reform. Another possible reform would be to give additional support to student organizations with larger populations of transgender students in general, providing monetary and/or administrative support to student groups that have already organically proven to support students. In general, however, it is important that something happen soon to either directly support transgender students or to help them find networks of support of their own, given the high salience of these identities.

Research Directions

Future research on this topic is still needed. While this study began to explore factors that might influence major choice among transgender students, there are still many factors to consider that were beyond the scope of this study. One example of this is the need to study transgender students of color. It is known that race and transgender identity have strong points of intersectionality, and the ability to study this would likely call to the forefront more considerations that were absent from this study. On the topic of intersectionality, studying the intersection of transgender identity with almost any other identity would be of interest, as (while race is the most prominent example) many other idenities such as disability and class have been known to have strong interactions with transgender identity and thus might have different distributions or reasonings compared to other identity groups. Additionally, research that separates out different identities under the transgender umbrella might also discover interesting findings. While the point that students with different pronouns and identities are treated differently came up briefly in this study, pursuing this topic further would allow for a better

understanding of how the many complex identities under the broad umbrella of "transgender" might differ from each other. Finally, another possible research direction would be to explore this topic in a different institutional context. This study took place at a small, politically left liberal arts college, and other college contexts would likely have different campus climates that might influence these variables. The ability to examine other institutional contexts would help to understand the effect strength of the phenomena studied here, as well as to determine just how broad of a climate produces these effects (for instance, whether the general lack of support is different across institutions or consistent on even a societal level). Overall, there is still much more to be researched and understood in these communities, and many possible directions for such research to take.

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Appendix A

The following are the questions used in the survey distributed to participants. Questions are shown here without survey logic and without multiple choice selections.

1. What is your class year?
2. How do you describe your race/ethnicity? Select all that apply.
3. Which of the following best applies to you?
4. What are your pronouns? Select all that apply.
5. Please use this space to elaborate on your gender identity, if you so wish.
6. How do you describe your romantic orientation? Select all that apply.
7. How do you describe your sexual orientation? Select all that apply.
8. Do you have a current major or intended major?
9. What division(s) is/are your current or intended major(s)?
10. Do you intend to complete the honors program?
11. What is/are your current or intended major(s) and minor(s)?
12. Did you have an intended major(s) in mind when you entered College?
13. Have you ever changed your major(s) or intended major(s) after freshman year?
14. What major or major(s) did you previously pursue? (Please list all previous majors.)
15. Why did you change your major? Please list any applicable reasons.
16. Do you have multiple majors/intended majors? If so, please list which you will answer questions for first.
17. How satisfied are you with your current major as a field of study?
18. How satisfied are you with your current major as a department at College?
19. How much do you enjoy each of the following within your major?

	Like a great deal (1)	Like somewhat (2)	Neither like nor dislike (3)	Dislike somewhat (4)	Dislike a great deal (5)
Class content (1)	o	o	o	o	o
Workload (2)	o	o	o	o	o
Teaching (3)	o	o	o	o	o
Interactions with professors (4)	o	o	o	o	o
Interactions with other students (5)	o	o	o	o	o

20. Do you feel that romantic/sexual orientation and/or gender identity should be acknowledged in your major?
21. How much are romantic/sexual orientation and gender identity acknowledged in your major?
22. How well do you feel that the topics of romantic/sexual orientation and/or gender identity are treated in your major?
23. Use this space to elaborate on your answers to any of the past questions, if you like.

Appendix B

The following is a list of the questions used to frame the semistructured interviews.

1) Can you tell me a little bit about yourself?
2) How do you identify in terms of romantic/sexual orientation and in terms of gender?
3) How open are you about these identities?
    a) Has your openness with these identities changed over time? If so, what do you think has contributed to that change?
    b) (If applicable) What has your experience been like being open with these identities at College?
4) How important do you think any of those identities are to your everyday life?
5) How did you decide to come to College?
6) What field or fields of study were you thinking about majoring in when you came to College? Have they changed over time?
7) What is/are your current major(s) and minor(s)?
8) What's your favorite thing about your major(s)?
9) What's your least favorite thing about your major(s)?
10) How would you describe the culture of your major(s)? What do you like/dislike about it?
11) Are gender and/or sexuality discussed within your major?
    a) (If yes) In what context are they discussed? How do you feel about the treatment of it?
    b) (If no) Do you think that they should be?
12) How important do you think any of the identities we talked about earlier are to your experience with your major(s) as a subject area? As a department at College?

a) (If the participant is transgender) How easy or hard has it been for you to have your pronouns/identity respected within your major at College?

13) How well do you feel that you fit in with other students in your major(s)? How important is that to you in terms of your satisfaction of your experience?

14) Have you taken courses in other departments that address gender and/or sexuality? Would you want to take such a course in future? Why or why not?

15) Where do you see yourself five years from now in terms of career? How does your major and/or identity impact that?

16) Is there anything else you want to tell me that you think would be helpful?

17) What would you prefer your pseudonym to be if I reference this interview?