

## Introduction

Internationalizing higher education has recently been brought to the forefront of the academic agenda, with an emphasis placed on the importance of international graduate student enrollment at universities (Knight & de Wit, 2018). High-ranking universities tend to focus on international graduate student recruitment to build their research capacity and, thus, their rankings (Horta, 2009). For example, in the United States (U.S.), international students have historically strengthened universities' research prowess in science, technology, engineering, and math (STEM; Pandit, 2007). In Europe, a strong international graduate student population has also been associated with the success of internationally ranked universities (Horta, 2009).

Specifically, within colleges of agricultural and environmental sciences (CAES), international graduate students contribute to global collaborations and bring in scholars from their home countries to strengthen the research agendas of their universities and the makeup of the university's scientific community (Pandit, 2007; Tanyildiz, 2015). Additionally, international students' interactions with domestic students in CAES may benefit domestic students who are in need of greater intercultural competency as they enter a globalized job market (Heinert & Roberts, 2016; Siczek, 2015). Finally, recruitment of top-performing international graduate students to CAES also contributes to the internationalization of U.S. Land Grant Universities (LGUs), which has been a priority for Extension (Lundy, 2007).

In the competitive global higher education market, recruitment of top international graduate students is no simple task. When searching for graduate programs, international students are concerned with funding availability, program acceptance, faculty quality, and visa requirements (Srivastava et al., 2010), issues that can limit accessibility to graduate education for international students. Once enrolled, international students face additional challenges, including several cultural barriers in U.S. universities, including language challenges, culture shock, navigating finances, adjusting to a new education system, and acclimating to U.S. teaching environments (Amirali & Bakken, 2015). Therefore, understanding prospective international students' motivations to study in the U.S. amidst these potential challenges is crucial to successfully recruiting and retaining international students (Mostafa & Lim, 2020).

A strategic communication plan is needed to properly reach and engage international students through their preferred communication media (Ammigan & Laws, 2018). Communication channel and information-seeking preferences of international students may vary according to educational level, with graduate students utilizing different channels than undergraduate or secondary school students (Alzougool et al., 2013). To this end, several strategies have been implemented to recruit international graduate students including strategic social media use across multiple platforms (Choudaha, 2013) and the creation of inclusive websites that cater to the specific cultural needs of international students (Diwanji, 2022).

However, strategic communication across cultures is no simple task. New media, or digital media, influences not only how national cultures evolve but how intercultural communication occurs, thus shaping online international experiences from various national viewpoints (Singh, 2010). For example, communication channel use may vary across cultures according to the tools to which international students have access in their home countries. Saudi Arabian females have unique access to certain websites because of "cultural, educational, and digital differences" (Binsahl et al., 2020, p. 873), therefore, limiting the types of websites and social media to which access is granted. Binsahl et al. (2020) found that because of these differences, female Saudi Arabian international students in Australia displayed unique digital and

personal information-seeking behaviors when they were in their programs, utilizing YouTube and Google to help with their coursework or even asking other Saudi students questions over Twitter or in-person because of their limited English capacities.

Communication over social media for finding specific information also varies according to culture – with cultural identity influencing the manner in which people from different belief systems or nations utilize social media (Dobbins et al., 2021). Additionally, engagement with university content on social media may vary across cultures based upon the popularity of social media platforms – such as Twitter and Instagram – in different countries and among specific age groups (Byrd et al., 2023). Finally, in addition to digital tools, international students are also interested in strategic communications from universities in countries besides their own that include “some form of public physical presence by respective universities...to advise them about overseas study” (Chung et al., 2009, p. 62).

Alongside international graduate student recruitment, U.S. universities must simultaneously prioritize recruitment of top-tier, domestic graduate students, seeking to understand the choice process and background characteristics associated with prospective U.S. graduate students (English & Umbach, 2016). A myriad of studies have focused on recruitment of domestic graduate students (Lei & Chuang, 2010; Pooch & Love, 2001; Royo-Vela & Hünernmund, 2016) and prospective students’ motivations to pursue graduate education (English & Umbach, 2016; Shellhouse et al., 2020). Other studies have focused solely upon the preferences of international students, some of which are built upon the needs of international students and their preferences of resources related to international student services (Ammigan & Laws, 2018; Diwanji, 2022). However, reports in the past have emphasized the importance of distinguishing the success of communication tactics between domestic and international audiences (Archer et al., 2010).

Existing literature distinguishing between international and domestic graduate students’ communication preferences for the same services is limited, and studies that do exist exhibit only marginal differences in communication preferences between the two groups (Ammigan & Laws, 2018; Ohio State University, 2017; Saw et al., 2013). One report examined the differences in social media preferences between international and domestic students found little difference between the preferences of the two student groups (Saw et al., 2013). Therefore, it may be beneficial to further explore students’ motivation behind their use of particular channels through rich, qualitative inquiry and analysis.

Additionally, there is a need to increase the number of science, technology, engineering and math (STEM) doctoral graduates from underrepresented groups (Sowell et al., 2015) and empower underrepresented student groups to pursue graduate opportunities. One study examined the effects of STEM workshops on underrepresented student groups’ self-efficacy and perceptions of support in attending graduate programs (Clark et al., 2021). The findings revealed the STEM workshops were effective at increasing self-efficacy to attend graduate schools at these universities; however, self-efficacy is only one factor which affects students’ motivation to apply to a graduate program (Clark et al., 2021). Therefore, further exploration about the motivations and preferences behind diverse students’ experiences in applying to graduate institutions is needed.

Previous literature about the graduate institution search process has also shown that older, female students who have some experience in the professional workforce are more systematic and rational in their graduate student search process than younger, less experienced students (McNicholas & Marcella, 2022). It is, therefore, necessary to examine the communication

experiences of a diverse students in various stages of life to understand their graduate program search process. Additionally, literature about the prospective graduate student communication preferences of international students at LGUs is limited from an agricultural and environmental science standpoint. To contribute to agricultural advancement and global partnerships, including the internationalization of Extension efforts (Lundy, 2007), recruitment communication practitioners within agricultural and environmental sciences would benefit from exploring the communication preferences of both international and domestic graduate students.

## **Conceptual Framework**

### **Cultural Dimensions Theory**

Cultural dimensions theory (Hofstede et al., 2010) was used as the theoretical framework for this study. Cultural backgrounds have been used to explore students' choices regarding their undergraduate education (Jian et al., 2010), graduate education, and preferred information sources for graduate education (Chung et al., 2009). Additionally, previous research has identified cultural identity as influential on use of and engagement with communication platforms, affecting individuals' interpretation of agricultural and environmental science communication (Dobbins et al., 2021). Cultural dimensions theory defines a dimension as "an aspect of culture that can be measured relative to other cultures" (Hofstede et al., 2010, p. 31). Cultural dimensions are scores assigned to a country along a continuum using six categories that reflect cultural values including a) power distance, b) individualism-collectivism, c) masculinity-femininity, d) uncertainty avoidance, e) long-term and short-term orientation, and f) indulgence-restraint (Hofstede et al., 2010).

From the lens of graduate institution choice, Chung et al. (2009) examined the influence of cultural values on preferred university information sources and graduate school choice among millennial high school and college students in Malaysia and Singapore. The findings revealed cultural values positively influenced a student's choice to attend graduate school in a country in which they felt they could integrate well (Chung et al., 2009). The overall results indicated cultural values had a positive association with institutional choice, and cultural values were strongly correlated with preferences for university information sources in the study context (Chung et al., 2009).

Pergelova and Angulo-Ruiz (2017) combined Hofstede et al.'s (2010) cultural dimensions with Inglehart and Baker's (2000) cultural dimensions to examine the effects of advertising and relational higher education marketing in Peru and Canada – countries differing in their levels of collectivism-individualism and power-distance. They found advertising (i.e., television ads, print ads, etc.) and relational marketing (i.e., open houses, campus visits, in-person conversations with alumni) directly and significantly influenced higher education institution choice of undergraduate students in Peru – a collectivist country with high power-distance - but was not as effective in Canada – a high individualism country with low power-distance (Pergelova & Angulo-Ruiz, 2017).

Tsiligiris et al. (2021) conducted a study in the United Kingdom with graduate students to explore their individual-level cultural values and the expectations they had for higher education institutions. The findings revealed several statistically significant correlations between students' individual-level cultural values and their expectations of an institution (Tsiligiris et al., 2021). Specifically, students who valued long-term orientation and uncertainty avoidance had high

standards for educational quality including expectations around buildings and technologies, reliability and responsiveness of the institution and its faculty, the ability of the institution to prepare its students for the job market, and the empathy exhibited by the institution (Tsiligiris et al., 2021). The findings implied universities needed to identify students' cultural values in order to provide a satisfactory university experience that caters to students' needs and creates an inclusive higher education environment (Tsiligiris et al., 2021).

The most popular cultural dimension, collectivism-individualism (Ma & Allen, 2009), posits that collectivist societies put the needs of the group above that of the individual, and individualist societies put the needs of the individual above the group (Hofstede et al., 2010). The perception of self has been found to influence how individuals elect to use social networks and parts of communication processes (Ma & Allen, 2009). Additionally, collectivism-individualism preferences can cause individuals to seek organizations that are in alignment with their cultural values, which may impact recruitment strategies (Ma & Allen, 2009). Therefore, within cultural dimensions theory, collectivism-individualism was the focus for the present study.

Collectivism-individualism is a key component of communication preferences. For example, Kapoor et al. (2003) found respondents from India were more collectivist than respondents in the U.S. Collectivist Indian respondents also preferred indirect communication – a type of communication that contains subtle meanings outside of the words used rather than direct expressions (Kapoor et al., 2003; Merkin et al., 2014). Additionally, individualists from Western cultures such as the U.S., Canada, or Israel are also more likely to participate in self-promoting behavior than collectivists from East-Asian cultures such as Japan and Singapore (Heine & Hamamura, 2007; Merkin et al., 2014).

Collectivism-individualism can also influence online communication channel use and information-seeking behaviors. A review of the literature on social media and social identity across cultures found people from collectivist cultures use social media to find others with similar backgrounds and interests, while those from individualist cultures are more likely to use social media to build their personal networks (Dobbins et al., 2021). Use of the internet for tasks beyond social media also varies according to individualism-collectivism. For example, countries that tend to score higher in individualism in Europe indicated they used the internet for the primary aims of shopping online, completing forms, personal emails and banking (Hofstede et al., 2010). However, the continuously evolving nature of internet behavior and social media communication necessitates additional research and frequent reexamination of communication preferences across cultures.

Additionally, at universities, students from collectivist countries (e. g. China) exhibit differences in communication and thinking styles than students from individualistic countries (e. g. U.S.) due to their cultural backgrounds (Lu et al., 2021). Lu et al. (2021) found students in China, who are more accustomed to focusing on harmony within groups, tended to prefer an information-seeking style of critical thinking in which they searched out various perspectives (often in the form of reading research) to form an opinion about an issue and were comfortable living in harmony with those who held different opinions from their own. However, U.S. students tended to prefer an engaged style of critical thinking by interacting with others to reach a conclusion and feeling confident in their ability to utilize reasoning in problem solving (Lu et al., 2021).

Finally, students' information-seeking behaviors can be influenced by their cultural values – in part attributed to collectivist-individualist dimensions – because of the cultural norms

to which they adhere within their home countries (Binsahl et al., 2020). Binsahl et al. (2020) found that Saudi Arabian female international students studying in Australia struggled to find information when studying in the Western, individualist country because of their cultural practices in which their families made decisions collectively in the collectivist Saudi culture. Additionally, they were called upon to take more individual actions in educational decisions, separate of their families (Binsahl et al., 2020).

Therefore, differences in societal priorities present challenges for international students in country contexts vastly different than their own. Though individualism-collectivism has been explored from various angles within higher education, little literature exists within CAES exploring connections between cultural backgrounds and communication preferences for prospective graduate students.

## **Information Seeking**

The concept of information-seeking behavior, a process which commences when an individual has a gap in their knowledge and a desire to fulfill that gap (Krikelas, 1983) also informed the study. The information-seeking process concludes when a knowledge gap is closed because informational needs have been fulfilled (Krikelas, 1983). Timmers and Glas (2010) recognize information-seeking behaviors can be cognitive, affective, or physiological. The instrument developed by Timmers and Glas (2010) measures the physiological and cognitive elements of undergraduate students' information-seeking behavior. However, other information-seeking studies have sought to explore how specific elements such as personality traits (Al-Samarraie et al., 2017) or geographic location (Fortner et al., 2021) influence individuals' information-seeking behaviors.

Therefore, information seeking has been examined in conjunction with a diverse set of communication theories and frameworks. For example, information-seeking behavior is congruent to information search, which is one of five stages in the student decision-making model proposed as a way to elucidate undergraduate students' decision-making process when selecting an institution (Moogan, 2020). The five stages of decision-making include: "problem recognition", "information search", "evaluation of alternatives", "purchase/consumption", and "post-purchase evaluation" (p. Moogan, 2020, p. 84). However, these decision-making models have been largely focused upon the decision-making processes of undergraduate students within the context of one country without acknowledging differences in decision-making processes experienced by graduate students or international students (Moogan, 2020). Therefore, further research on information-seeking behaviors is needed among graduate student populations, especially international graduate students (Moogan, 2020)

Information-seeking behavior has also been a crucial part of uses and gratifications theory, which posits individuals are active consumers of media who select specific types of media to fulfill specific self-actualization needs – cognitive, affective, personal integrative, social integrative, and tension release (Katz et al., 1973). Additionally, studies have suggested individuals' information-seeking behaviors influence their critical thinking and, thus, how they interpret new information and make decisions about it (Lamm & Irani, 2011). While information seeking is associated with multiple theoretical frameworks, the ways in which prospective students – specifically international students – seek information can be sporadic and iterative with no specific methodology, in most cases (McNicholas & Marcella, 2022). McNicholas and Marcella (2022) found many students began their information search for an international

institution at which to study and would revisit each institution with new eyes depending on the new information presented to them by friends, family, or online platforms.

### **Purpose and Research Questions**

The purpose of this study was to explore communication preferences of successful agricultural and environmental science graduate students from individualist and collectivist societies when they were selecting their graduate institution at a research-heavy, land grant university. The questions guiding the study were: 1) What communication channels did graduate students from collectivist cultures use when searching for graduate research programs and what were their experiences using those channels?; and 2) What communication channels did graduate students from individualist cultures use when searching for graduate research programs and what were their experiences using those channels?

### **Methods**

Because this study was conducted at one university, a case study methodology was employed (Ary et al., 2013). Case studies in qualitative research “[focus] on a single unit to produce an in-depth description that is rich and holistic” (Ary et al., 2013, p. 485). In this case study, the unit of focus was a single institution, and the questions were aimed at attempting to understand the communication channels used and the experiences graduate students had with those communication channels during the graduate program search process (Ary et al., 2013). The study utilized semi-structured interviews to engage graduate students in in-depth conversations oriented around the question of what the graduate search experience is like from the perspective of intercultural communication in order to assist recruitment efforts across agricultural and environmental graduate research programs (Vagle, 2020; van Manen, 2017). During the interviews, the interviewer posed follow-up questions based on participant responses to further interpret their experiences (Seidman, 2006). The interview guide was reviewed by a panel of experts in graduate education and science communication before being approved by the University of Georgia (UGA) Institutional Review Board (IRB).

The following subjectivity statements serve as a form of *bracketing* (Farrell, 2020), a concept in Husserlian phenomenological literature in which the researcher identifies personal experiences with the phenomenon “in an effort to set them aside” (Creswell, 2007, p. 78). The first author, interviewer, and coder was a full-time graduate student in the Department of Agricultural Leadership, Education and Communication (ALEC) at the UGA. As a graduate student in the college the study was being conducted, the interviewer had to account for personal experiences with graduate school communication and choice. The interviewer selected the institution because of existing relationships with the faculty, an assistantship opportunity, and it was in her home state. The second author was also a full-time graduate student and doctoral candidate at UGA in ALEC. She was directly recruited by a trusted mentor and advisor and primarily relied on interpersonal communication methods for her graduate school selection process. She only applied to one graduate research program due to the strength of the recruitment communication methods experienced. The third author was an ALEC professor at UGA with a specialization in science communication. The professor previously served as the departmental graduate coordinator. Additionally, the professor had served as primary advisor for seven

doctoral students and 12 master's students during her career and considered these personal influences throughout the study and peer debriefing process.

Participants were 19 purposively selected graduate students from UGA's CAES. Considered the "top" students in their department, these participants were selected because university administrators and researchers were interested in understanding the experiences of students who were successful in their current programs in order to attract students who are considered similarly successful and significantly contribute to the research capacity of the department. However, the study is limited by the experiences of only students considered successful in their studies and research. Future research should examine further the experiences of all graduate students regardless of their research and academic success. The researchers elected to focus on only one university to better understand the experience of students across different discipline areas at one university, rather than attempting to understand the experiences of students at different universities. A single university was also selected because of the similar application process and minimum qualifications which students had to complete to attend this research-heavy, land grant university. Future studies should examine the experiences of students across various universities to determine if they align with the same experiences of students in this CAES.

To identify potential participants, a CAES administrator emailed each department head requesting they nominate two graduate students from their department – one domestic and one international – who met the following qualifications: a top student within the department (both academically and in research), submitted a strong graduate application upon entering the program, exhibited strong dedication to their department and advisor, viewed by faculty as a student with future success in the field, and collaborated well with other graduate students in research projects. Upon receiving names, the interviewer emailed students directly asking them if they would like to participate, specifying there would be no penalty for declining. Twenty-three students were invited to participate and 19 chose to participate: 10 domestic and nine international (see Table 1). Because cultural differences may exist between states within the U.S. and students may be looking for different university characteristics when searching in-state compared to out-of-state, the U.S. states in which domestic students grew up were included in Table 1. All interviewees were full-time graduate students with funding.

Interviews were conducted either face-to-face or over Zoom video conferencing during the fall 2021 academic semester. Interview method was based upon graduate student locations on university satellite campuses or personal comfort levels associated with safety aspects of the COVID-19 pandemic occurring at the time. The interviewer offered to drive to satellite campuses, but ultimately, participants requested Zoom. If participants elected to participate over Zoom, only the audio portion of their interviews was retained in order to reduce threats to confidentiality and privacy in accordance with IRB protocol.

Each interview was conducted by one interviewer to ensure consistency across interview protocol questioning. The semi-structured interviews lasted approximately 60 minutes and participants were assured data would only be reported in aggregate and pseudonyms assigned to protect their confidentiality. Because there were only two participants from each department selected for the interview, the discipline area of each participant was not included because this information, along with the other demographic characteristics displayed in Table 1, could make them easily identifiable. Participants' areas of study included food science and technology, plant pathology, horticulture, plant breeding, genetics and genomics, crop and soil science, animal and

**Table 1***Characteristics of Interview Participants*

Pseudonym	Observed Gender	Degree Sought	Status	Country of Origin	State of Origin	Collectivist or Individualist	Interview Type	Campus
Elijah	Male	PhD	International	Benin	n/a	Collectivist	Zoom	Main
Yvette	Female	PhD	International	China	n/a	Collectivist	In-Person	Main
Lorelai	Female	PhD	International	China	n/a	Collectivist	Zoom	Main
Sara	Female	PhD	International	India	n/a	Collectivist	In-Person	Main
Jack	Male	PhD	International	Jamaica	n/a	Collectivist	Zoom	Satellite
Matt	Male	PhD	International	Nepal	n/a	Collectivist	In-Person	Main
Charles	Male	PhD	International	South Korea	n/a	Collectivist	In-Person	Main
Leah	Female	PhD	International	The Philippines	n/a	Collectivist	In-Person	Main
Oliver	Male	PhD	International	Turkey	n/a	Collectivist	In-Person	Main
Victoria	Female	Master's	Domestic	US	GA	Individualist	In-Person	Main
Allie	Female	Master's	Domestic	US	VA	Individualist	In-Person	Main
Lacy	Female	PhD	Domestic	US	NY	Individualist	Zoom	Main
Joshua	Male	PhD	Domestic	US	HI	Individualist	Zoom	Satellite
Kimberly	Female	PhD	Domestic	US	GA	Individualist	In-Person	Satellite
Tonya	Female	PhD	Domestic	US	IL	Individualist	In-Person	Main
Natasha	Female	PhD	Domestic	US	GA	Individualist	In-Person	Main
Nate	Male	PhD	Domestic	US	TN	Individualist	Zoom	Satellite
Rachel	Female	Master's	Domestic	US	GA	Individualist	In-Person	Main
Karter	Female	PhD	Domestic	US	AR	Individualist	In-Person	Main

dairy science, entomology, poultry science, agricultural and applied economics, and agricultural leadership, education and communication.

The first section of the interview protocol included questions examining personal aspects of participants including countries of origin, family, experiences growing up, experiences with agriculture, degrees pursued, and interest in the subject matter. The second section included questions examining the type of communication tools participants used when exploring potential graduate programs – not limited to the communication used only for the University of GA. Questions asked participants to detail the communication tools they found most useful when searching for a graduate program, how they learned about faculty research, with whom they corresponded, the type of media channels used or accessed about the institution, the decision-making process leading to the selection of an institution, and if there were any missing or lacking communication tools. Each question contained probes that allowed interviewers to ask follow-up questions or probe the interviewee for more information related to the question route. Participants were not given a specific list of media channels within the interviews, but examples were provided if students asked for further clarification. Examples included email exchanges, videos, journal articles, conference presentations, social media posts, and news articles, but participants were invited to list other communication tools.

Audio recordings were transcribed verbatim by a third-party service and uploaded to the data analysis software MAXQDA for thematic analysis. Data were analyzed using inductive analysis, which uses a data-driven approach to identify patterns and recurring themes in the data to categorize textual information and the relationships between identified patterns (Fereday & Muir-Cochrane, 2006; Nowell et al., 2017; Vaismoradi et al., 2013). A single, lead coder (primary author) conducted the thematic analysis by manually coding all of the interview transcripts. Throughout the analysis process, the lead coder created a codebook, which served as an audit trail, to ensure credibility and integrity (Lincoln & Guba, 1985). To establish dependability, the lead coder participated in peer debriefing with a university faculty member with expertise in social science research within a scientific context to enhance the trustworthiness of findings (Barber & Walczak, 2009; Lincoln & Guba, 1985) and adjusted the codebook accordingly to include broader categories of preferred communication tools. Using Hofstede et al.'s (2010) cultural dimensions of collectivism-individualism to triangulate the inductive themes generated in the analysis allowed researchers to explore the communication preferences of students from more collectivist and individualist countries, though all international students were classified as from collectivist backgrounds. Theoretical triangulation of the communication preferences combined with Hofstede et al.'s (2010) theory enhanced the confirmability of findings for participants from the two types of backgrounds based on the collectivism-individualism dimension (Stahl & King, 2020).

## **Results**

### **Collectivist Participants' Communication Channel Use**

Collectivist participants used various communication channels to work through their selection process of a graduate institution. Often collectivist participants selected one communication channel to gather initial information before seeking more in-depth information with another channel. Four themes emerged in communication channels prospective graduate students from collectivist cultures used: *email, departmental and lab websites, journal articles,*

and *social media*. Participants' experiences with each communication channel theme are discussed.

Participants from collectivist cultures predominately preferred *emails* as a communication method for recruitment. *Emails* with prospective faculty advisors helped participants narrow their program searches. For example, Lorelai used email to learn more about her advisor's personality and research: "We had email exchanges and he actually sent me a draft of his research proposal," thus ensuring her research interests were in alignment with his and preceding multiple *email* exchanges about the type of study she could do for her dissertation. Determining research interest alignment through *email* was of paramount importance for collectivist participants, given the cost-prohibitive nature of applying for students who were all international. because of the cost, participants needed to limit the number of graduate institutions to which they submitted applications. Matt recalled sending GRE and TOEFL scores, having transcripts internationally evaluated, and locating a middle man to pay the application fee because there was no way to directly pay. He said, "[s]o it used to be a big, big challenge...deciding to apply spending a lot of money if you [didn't] have work. Email would help you shortlist that... And then you [knew] whether they [had] the funding to host you."

Securing funding was repeatedly mentioned as an item sought for students from collectivist cultures. Charles emphasized the importance of featuring funding on *departmental websites* and its role in *email* correspondence. He said, "[m]ost of the time if you email[ed] somebody in the department [without funding listed on their page] you [wouldn't] usually get a reply." Charles went on to lament that replies often involved professors about to retire, without funding, or lacking room for another student. Participants also used *departmental and lab websites* to initially gain information on prospective faculty advisors. Sara said, "I relied really on the department websites, because they [gave] you not only the contact information, but also...the professors' research interests and also their recent publications...that's where you [found] all the information that you need under one roof." Elijah used *departmental websites* strategically because he was uninterested in attending an institution with fewer than three faculty who shared his research interests. Elijah said:

I [would] first do a short listing of faculties that I [was] interested in. And [then] I [went] to the personal web pages and I [went] through the articles so that I restrict[ed] further the choice...if in the end, I [was] lucky to still have at least three professors, then I [applied] to that department.

Participants also sought information about the logistics of the program in which they were interested from *departmental websites*. Jack said he explored *departmental websites* to "see how long it would take to get a degree from the institution" and the kind of endowment the institution had. *Lab websites* also led participants to understand the type of students which would fit best within the program. Matt said he used the social aspects found on the site where "they post[ed] for social activity things, like a lab outing [or] lab events. So those kinds of stuff [gave] you an overall picture of the lab and how big, how fun, how together, how close the lab [was]."

Participants from collectivist cultures used *journal articles* to determine the research interests of prospective faculty advisors. *Journal articles* were especially impactful for participants like Lorelai who had a detailed evaluation process for identifying programs of interest. Lorelai said she used *journal articles* to determine how active the lab was "by checking the publication[s], how many times they publish[ed] in each year, and what [was] their most

recent publication. [Did] they have coherent publication years or they only, for example, had one publication five years ago and they [hadn't] published [other] things?" *Journal articles* also helped collectivist participants find faculty members with strong reputations and similar research interests, especially those participants who were interested in dynamics of team science. Oliver stated, "when I read the article, I look[ed] at names. If we [had] names from different departments or schools, that [meant] that part of the study was done by others." He preferred studies that stayed within the same department to ensure the quality of the samples taken and the research methodology behind them because this applied to his particular research ethics.

Finally, several collectivist participants mentioned the usefulness of *social media* for two different reasons: connecting with current or recently graduated students and getting to know about the university culture. Sarah and Matt said Facebook was beneficial in reaching out to current students when the department did not list their contact information. Yvette said *social media* was beneficial because it gave her the opportunity to reach out to current students and recent alumni of her program through Facebook Messenger where they told her in a message or over the phone later that her advisor was...

... very, very understanding and also very patient and [gave] them very good advice in life or career or studying.... they described the lab environment... students help each other, everybody becomes friends... And... every year [lab members] have a great opportunity to get to know people from industrial side.

Other participants mentioned relying upon *social media* to understand more about university culture through YouTube or Facebook videos displaying the equipment students were working with or the university buildings, allowing participants to picture themselves within a department. Lorelai, however, noted that old YouTube videos by the department were not helpful because they were low resolution and did not display current equipment. Elijah and Jack also recognized that they didn't rely as much on videos on social media because they often display only the good things about the department. Elijah instead relied more heavily upon the experiences of other international students with whom he connected to understand the culture of the university.

Leah used Facebook to see how faculty were promoting student work. Leah said she was looking for a personal touch from faculty, and social media was where she found it "because I [knew] as a PhD student, I [would] be able to learn things on my own, but... [faculty could] lead me to the right path...and then introduce me to networks, just prepare me to where I want to be."

### **Individualist Participants' Communication Channel Use**

Four themes emerged as communication channels used by participants from individualist cultures: *emails, in-person visits, lab and departmental websites, and direct and interpersonal communication*. Experiences of participants related to each communication channel theme are discussed.

*Emails* were repeatedly raised as a vital communication channel for individualist participants because they established initial connections and then were used to further communication. Joshua was a unique case who found his doctoral opportunity through an *email* from a professional society advertising an assistantship opportunity at the UGA. Joshua said, "I just applied through that email and that was the beginning of my search and I got accepted, so I just stopped." Other students like Lacy explored their options at multiple institutions. Lacy was introduced to her current faculty advisor over email in a professional tone. Lacy said, "[Faculty

advisor's] email was much more professional [than my interactions with students], but it was also very approachable" and was the first of many conversations that turned into regular phone calls. Rachel was already familiar with faculty from interactions during her undergraduate minor at UGA, and she said, "I guess email communication is just easy as a follow-up tool. I'm not comfortable calling and leaving voicemails because... I think most professors prefer to be communicated through email, in my experience."

*In-person visits* were influential in providing individualist participants with departmental culture insights. Allie, who was only able to visit UGA out of all her available options before the onset of the COVID-19 pandemic, said a student showing her around "made me feel comfortable, introduced me to several people we just walked by in the department. So it felt very casual and friendly and no one seemed standoffish that all really... So it was a very welcoming environment." Joshua agreed his in-person visit and interview with his prospective faculty advisor "was the best experience in terms of communication. Because we got to be in person and elaborate more on things and [faculty advisor]... describe[d] the kind of research that he want[ed] [me] to do. And a little bit more on his expectations." Several individualist students had interacted with faculty beforehand through conferences or research, but the in-person visit ultimately solidified their interest in attending UGA on a personal level. For example, Nate said,

I came to visit [faculty advisor] and I went on... a campus tour and then we went to some of the surrounding fields and we just got to talking about his background, my background... I felt like he was a very down-to-earth person.

Nate's *in-person visit*, similar to other individualist students, allowed him to make a decision on whether or not the university and his advisor would be the right fit for a long-term research commitment.

The *departmental and lab websites* theme emerged from individualist participants who, like Victoria, spent "a lot of [time] looking at their department web pages to see who was listed on the faculty and what kind of research they did." Participants were interested in conducting specific types of research and were seeking faculty who could help them achieve their research goals. Individualist participants also used *lab websites* to see what faculty members prioritized in their labs. Lacy said, "[h]ow those websites were structured was particularly useful because it gave you a sense of what the lab prioritized. Is it prioritizing publications? Is it prioritizing focusing on the people? Is it educating the public?" Several participants mentioned both the biography and the publication patterns of the faculty found on the *departmental and lab websites* were important to them because they wanted to determine what the faculty were publishing and if faculty could help them on research committees or in exploring research techniques in the future. However, Tonya looked at few other institutions and spent more time on the *departmental websites* "trying to get a feel of where I was coming to, just trying to get an idea of the different professors and stuff in the department, and what they were doing". Karter was interested in a degree that offered her some flexibility and found possibilities of this on the *departmental websites*. Karter said she discovered on the *departmental website* of her current graduate program that within the program "I could do a lot of building my own path, taking classes outside of the department and getting a really well-rounded degree."

Finally, individualist participants detailed the *direct and interpersonal communication* processes were helpful after pre-established relationship with faculty. Once Natasha identified a faculty member with shared research interests, she would reach out to them to initiate

communication then determine both personal and professional faculty characteristics over a Zoom or Skype conversation, "...just to get an idea of what they were like on the phone. Were they kind? Were they not kind? Did they seem interested in what I did? Things like that." Other students had interpersonal connections with faculty members and had previously interacted with them at research conferences to establish relationships and gain information about the programs. Karter, who had a connection at UGA from a former faculty advisor said, "I had already had such a strong interpersonal relationship that I didn't feel the need to complement that or supplement that with media." Additionally, Victoria said she found it most beneficial to talk with people in her life about the personal benefits to her of a graduate degree. Victoria said, "I think they gave me some good advice on how that graduate degree would benefit me in my career...just a lot of talking to different people, getting their takes." Because Victoria's family and mentors knew her and her career goals so well, they were able to guide her in deciding on a graduate program based on its potential benefits to her personally.

### **Discussion, Conclusions, and Recommendations**

Overall, participants from both types of cultural backgrounds used a variety of communication channels to obtain information and connect with relevant departmental contacts. Each participant used more than one communication channel and used each channel to achieve a specific purpose, though their cultural backgrounds and associated information-seeking characteristics may have informed their information-seeking tendencies (Binsahl et al., 2020).

However, before implications and recommendations surrounding this study can be discussed, it is necessary to recognize the limitations. First, interviews were conducted at one research-heavy, land grant university in a CAES. Therefore, the experiences of the participants described in the results are limited because experiences of communication may not be the same across all CAES, especially since some CAES offer only masters level programs and the information-seeking process between master's and doctoral students may differ. Additionally, this study did not distinguish between participants pursuing master's and doctoral degrees because its goal was to distinguish between individualist and collectivist participants. The different academic experience levels could influence participants' interest level in research, as well as their skills to glean information about academic programs based on past experiences. Future studies should consider distinguishing students based on degree level, as well as interviewing students from several universities. Additionally, the discipline area of participants may have provided additional insight into the experiences discussed. However, in order to maintain confidentiality in this study, the researchers could not reveal the participants' discipline area, and this limitation should be considered when discussing the implications.

The *email* theme was identified as a preferred communication channel for participants from both collectivist and individualist cultures. This finding aligned with results from Ammigan and Laws (2018) who found international students preferred to send and receive university information through *email*. Additionally, The Ohio State University's report (2017) found *email* was the preferred information-receipt method for both domestic and international students. The results implied *emails* were important to participants from collectivist cultures because they could ensure faculty research interests aligned with their own and then narrow down their programs of interest. *Email* communications were especially useful considering the prohibitive costs of program applications for international students, important for those who will consider faculty and lab needs above their own based on collectivist background influences. *Emails*

helped participants from individualist cultures narrow their searches to labs that aligned with their research interests and were important because participants did not prefer to follow up with professors over phone calls. The preferences from individualist participants for email aligned with the individualist mindset of personal convenience (Hofstede et al., 2010).

Participants from both collectivist and individualist cultures expressed many of the same preferences for *departmental and lab websites*. Both participant groups used the *websites* to search for faculty research interest information, focusing on faculty members who could benefit participants as advisors or committee members. Specifically, participants were interested in publication patterns of faculty because they sought to meet publication goals associated with success in academia. *Departmental websites* were useful for both participant groups to determine the kind of students the department accepted and the logistics of obtaining degrees. *Lab websites* were useful for both participant groups to delve into specifics of the lab makeup like the number of researchers (graduate and professional level) and the current publications. However, participants from collectivist cultures more frequently mentioned the importance of displaying the lab's social aspect on *the lab website*. This may align with Ma and Allen's (2009) findings that posit individuals seek to see their cultural values – such as a healthy group dynamic that is crucial for individuals from collectivist cultures – within an organization during the recruitment process.

Collectivist participants were also interested in strong dynamics of team science that could be found in *journal articles*. *Journal articles* were frequently mentioned by collectivist participants because they sought research methodology and ethics that aligned with their personal standards and publications that occurred consistently and recently from a lab. This preference emphasizes a strong focus on group dynamics that aligns with Hofstede et al.'s (2010) cultural dimensions theory and Chung et al.'s (2009)'s findings that students want to study in a country in which they feel they can integrate well. Additionally, the findings align with Lu et al.'s (2021) finding that students from collectivist countries prefer to seek information by reading research.

Participants from collectivist cultures also mentioned *social media* more than individualist participants because they were interested in understanding university culture and speaking with other students to discern if they would fit within the lab or the university itself. Collectivist participants were likely to use Facebook to make initial contact with current students to gain information about their experiences consistent with the findings of Binsahl et al. (2020) who found female students from collectivist Saudi Arabia preferred to ask questions of other Saudi students. This finding somewhat contrasts the findings of Saw et al. (2013) who found marginal differences between communication preferences of international and domestic students on social media and little use of Facebook in international students' home countries. However, social media and information-seeking on social media has evolved globally since the publication of Saw et al. (2013) and may account for this shift in communication. Additionally, cultural use of social media varies according to individualist and collectivist backgrounds (Dobbins et al., 2021) and cultural norms of platform use within various countries (Byrd et al., 2023). Therefore, future research should explore countries of origin and information-seeking behavior on social media when searching for a graduate institution.

Themes that emerged more prominently for individualist participants were *in-person visits* and *direct and interpersonal communication*. The *in-person visits* helped individualist participants determine the atmosphere of their prospective lab and facilitated interactions with current students. The *in-person visits* presented the opportunity to speak more openly with

faculty members, assess personalities, and interpret research expectations in a personal manner not available through other communication channels. Similarly, *direct and interpersonal communication* were used for individualist participants to ensure their personalities aligned with prospective faculty advisors or build on pre-established relationships. The finding aligns with individualist cultural dimensions because individualists are more concerned with the independent self (Hofstede et al., 2010). *In-person visits* may have also served as forms of cognitive, affective, or physiological information-seeking (Timmers & Glas, 2010), therefore fulfilling multiple self actualization needs for the students visiting in-person (Katz et al., 1973).

Though collectivist and individualist participants expressed differences in their use of *journal articles*, *social media*, *in-person visits*, and *direct and interpersonal communication*, data analysis implied these communication channels provided each participant with information they needed to feel like their values – personal or cultural – aligned with the university, department, or faculty members. However, *in-person visits* would be cost-prohibitive to international students. Departments who are willing to fund visits for promising prospective students often do not have the funds to do the same for international students who prefer high-context, in-person communication from universities (Chung et al., 2009; Pergelova & Angulo-Ruiz, 2017). Additionally, *direct and interpersonal communication* often resulted from pre-existing relationships formed through personal networks, thus bolstering the confidence of individualist participants to communicate with faculty members because introductions had already been made. Because personal introductions were often not available to collectivist participants, they may have been more likely to turn to *journal articles* and *social media* to find the answers to bolster their confidence in attending an institution. Faculty seeking to attract students from collectivist cultures should highlight current *journal articles* with strong team science dynamics which appear to the ethical preferences exhibited by individualist participants. Additionally, *social media* should be strategically used to recognize international students from collectivist populations because international students may seek to see other students who look that them represented, and they may be more confident in reaching out to other students than faculty members to understand the student experience, especially because they may naturally trust students from their country of origin (Binsahl et al., 2020). Previous literature has called for more diversity in STEM fields (Sowell et al., 2015), as well as greater self-efficacy for underrepresented groups in their ability to participate in graduate education at predominantly white universities (Clark et al., 2021). Participating in these shifts in communication messaging may give underrepresented groups more self-efficacy and motivation to apply for research positions at predominantly white institutions.

Colleges and departments should also understand domestic students have an advantage over international students in the use of *in-person visits* and *direct and interpersonal communication*. Therefore, specific and strategic efforts should be made to create communication experiences that provide international students with some of the same opportunities in a diverse, equitable, and inclusive manner. For example, virtual campus visits with Zoom meetings including students and various faculty members could be arranged for prospective international students. Additionally, videos tours of the department (including labs) could be used to fulfill some international, collectivist student needs. There are college recruitment services that offer creation of virtual campus tours to appeal to undergraduate students. However, creating in-depth virtual tours of departments may be as cost-prohibitive to departments as bringing international students to visit in-person. Therefore, it may be in the best interest of CAES administrators to create strategic college-wide virtual tours that are designed to

appeal to prospective international graduate students, therefore highlighting the research happening in each department and creating a tour of the facilities. Additionally, because so many CAES graduate students engage in research in the field, experiment station directors at Land Grant Universities may wish to partner with departments to create virtual tours of experiment stations that will provide immersive experiences for both state stakeholders and prospective graduate students. These virtual tours could include greetings from faculty and a short overview of their research and how it is related to the field.

Future research could explore video messaging preferences of collectivist and individualist students. As Tsiligiris et al. (2021) found, there are significant relationships between students' individual-level cultural values and their expectations for institutions of higher education. Because the present study reveals collectivist students value what they see on social media, future research could examine the relationship between individual-level cultural values and students' reactions to videos that exhibit different types of university expectations on various social media platforms. Results from this research could inform how cultural values, expectations of universities, and communication on different platforms could all work together strategically to create the best recruitment experience for collectivist students.

Because of the shared preference for *emails* between both groups, courteous and prompt *emails* should be prioritized at the departmental and individual level to ensure students and faculty are able to quickly determine if there is further communication required. Faculty should be trained in how to subsequently follow up with preferred communication channels based upon cultural preferences for individual student groups. Both groups also valued *departmental and lab websites*; therefore, departments should prioritize the consistent maintenance of their sites in order to ensure faculty research interests and publications are current to draw in students looking for faculty who can help them reach their academic goals. *Lab websites* are of particular importance because they helped participants understand the priorities of the faculty members. If a lab has a strong team culture, faculty should highlight this on the *lab website* in order to attract students from collectivist cultures. However, faculty members often do not have the time to maintain research sites; therefore, communication professionals within departments should be assigned to help faculty with communication of their own research on websites. This may require a unique understanding of the research happening within the lab and specific training in science communication, which should be a top priority of CAESs.

Future research should be conducted to quantitatively examine the communication preferences of graduate students from different cultural backgrounds, increasing an ability to generalize these results. Further examining if relationships exist between a students' collectivism-individualism score and their preference for a type of communication channel could provide additional insights into effective communication with prospective graduate students. The addition of other cultural dimensions could also be informative because it would give researchers further insight into the additional variables influencing prospective students' communication preferences. Other demographic variables could also be useful in identifying communication preference differences. Specifically, age may be a variable of interest because it was not considered in the current case study and Inglehart and Baker (2000) suggest that cultural values can change across time.

Finally, because *lab websites* emerged as a primary information source, researchers should further examine how prospective graduate students from diverse cultural backgrounds interact with *lab websites* to learn more about their online information-seeking behaviors. Future qualitative studies could create mock *lab websites* and conduct interviews with students from

different cultural backgrounds to understand their feelings and experiences using the website. Additionally, quantitative studies could utilize eye-tracking software to identify aspects of lab websites that appeal to specific individuals and determine if cultural values or other demographic characteristics predict the elements of a site that appeal most to prospective student visitors, thus informing how sites should be built in the future to appeal to specific, targeted audiences. Overall, strong additional studies into this area of inquiry could result in practical, evidence-based communication plans to attract diverse students into colleges of agricultural and environmental sciences where they can increase research capacity and bring unique perspectives to the lab and university as a whole.

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