

The Perspectives of Applicants on the Diversity, Equity, and Inclusion Initiatives and Admissions Processes of Genetic Counseling Training Programs

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One of the challenges that genetic counseling faces as a profession is the lack of diversity in the field. In recent years, many genetic counseling training programs have developed their own diversity, equity, and inclusion (DEI) initiatives in order to promote diversity (Channaoui et al., 2020). There has been little research on how these initiatives have impacted prospective genetic counseling students. This study examined how applicants incorporated a genetic counseling program's DEI initiatives as well as other factors into their application and match decisions. This study also aimed to characterize strengths and barriers of the genetic counseling program admissions process for applicants belonging to underrepresented groups (URG). A survey was distributed to applicants from the past three genetic counseling admissions cycles (2020, 2021, 2022) through various channels including the Minority Genetic Professionals Network, emails of past University of Pittsburgh Genetic Counseling Program applicants, a listserv of genetic counseling program directors, and the Genetic Counseling Discord. When comparing how respondents from URGs and non-URGs considered a program's DEI recruitment initiatives in their decisions, a two-sample t-test with equal variances did find a statistically significant difference between both groups ($p < 0.0001$); 83.3% of URGs agreed or strongly agreed about this factor's importance compared to 44.7% of non-URGs. Through open-ended questions, participants expressed that the admissions process was not able to appreciate the experiences behind less visible identities such as a low socioeconomic status and being a first-generation student. Findings from this study identified areas of improvement for genetic counseling programs' DEI initiatives, and

could be used to inform potential changes in admissions processes and recruitment strategies for genetic counseling training programs that focus on underrepresented applicants. This study is important for public health as increasing diversity in the field can be important in better patient-provider interactions as well as greater patient satisfaction (Mittman & Downs, 2008).

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Preface

When I first started developing my thesis, I remember initially feeling overwhelmed by the magnitude of the project I was about to take on. I am fortunate to have had a wonderful thesis committee who helped me along every step of the way, whether it be through brainstorming ideas or answering any questions that I had. I would like to thank my thesis committee members Jodie Vento, Dr. Eleanor Feingold, Barbara Harrison, and Dr. Mylynda Massart for all of their support. A special thank you to my thesis chair Christine Munro for always checking in with me as well as providing encouragement and advice throughout the whole process.

I also wanted to thank all my program directors, clinical supervisors, and professors for giving me the knowledge and skills I will need as I move on to the next step of my career. I know that I have grown so much as a student and a person over the past two years. Considering that I can be pretty hard on myself, I am grateful for all the reassurance and support they all provided during my learning.

To my genetic counseling cohort, thank you for being my family away from home, especially when I was worried to move to a city where I knew no one. Many of my favorite memories during graduate school have been during our cohort hangouts, impromptu bubble tea runs, and our study room discussions. While I am sad that I will not be seeing you all every day, I know that you all will be lifelong friends!

Finally, a huge thank you to my family and friends who have been there for me from the beginning. They have always believed in me and supported me in whatever I have chosen to do. I feel incredibly lucky to have them in my life, and I would not be the person I am today without them.

1.0 Introduction

One of the challenges that genetic counseling faces as a profession is the lack of diversity in the field. Historically, the genetic counseling workforce has been composed of predominantly non-Hispanic white genetic counselors (Mittman & Downs, 2008). According to the National Society of Genetic Counselors' 2022 Professional Status Survey, 89% of membership identified as White, while 9% of respondents identified as Asian, 3% identified as Hispanic/Latinx, and 1% identified as Black/African American/African descent (National Society of Genetic Counselors [NSGC], 2022a). Prior studies have looked at factors that may be impacting the recruitment of individuals from underrepresented groups (URG) into the profession. For example, lack of awareness of the career, the financial burden of the admissions process, lower grade point averages, and lower standardized test scores have been named as a few of the barriers URGs encounter in the application process (Alvarado-Wing et al., 2021; Wolfe Schneider et al., 2009).

In recent years, the field has focused on taking steps to promote diversity in the field as well as increase outreach to individuals from URGs (Price et al., 2020). Some examples of these steps include online materials and presentations to expose elementary, middle, and high school students from URGs and increase awareness of genetic counseling. In addition, many genetic counseling training programs have developed their own diversity, equity, and inclusion (DEI) initiatives. For example, programs have begun incorporating DEI in their curriculums by having students take trainings focused on diversity and inclusion in the context of genetic counseling (Channaoui, Bui, et al., 2020). Expanding diversity in the field is important as increased diversity among health professionals is associated with better interactions between patients and providers, and greater patient satisfaction (Mittman & Downs, 2008).

While previous studies have characterized the efforts of the field to increase diversity, there has been little research on how these efforts have impacted prospective genetic counseling students. To address this gap, this study aimed to explore the experiences of previous genetic counseling program applicants as they navigated through the application process. Specifically, this study examined how genetic counseling applicants incorporate a genetic counseling program's DEI initiatives into their application and match decisions. Another focus of the study was to characterize strengths and barriers of the genetic counseling program admissions process for applicants from URGs. In addition, this study looked at any differences in the experiences of applicants from URGs who have matriculated to a program compared to those who have not.

To accomplish these aims, a survey was created that asked questions regarding factors that applicants considered while making their application and ranking decisions, with a focus on a genetic counseling program's DEI initiatives. Questions about applicants' experiences throughout the application and interview process were also included in the survey. Genetic counseling applicants from the 2020, 2021, and 2022 genetic counseling program admissions cycles were recruited to participate. To reach past applicants, we distributed the survey through the Minority Genetic Professionals Network, an email list of past University of Pittsburgh Genetic Counseling applicants, and the Genetic Counseling Discord. We also sent the survey to genetic counseling program directors for distribution to their past applicants. Results from this research could help identify strengths and weaknesses in genetic counseling program's DEI initiatives and how they are publicized. This analysis could also inform potential changes in recruitment strategies and admissions processes for genetic counseling training programs.

1.1 Specific Aims

1. Identify how applicants incorporate a genetic counseling program's diversity, equity, and inclusion initiatives into their application and match decisions.
2. Identify strengths and barriers of the genetic counseling program admissions process for applicants from under-represented groups (URG).
3. Differentiate experiences of applicants from URGs who have matriculated to a program versus those who have not.

2.0 Manuscript

2.1 Background

Historically, the genetic counseling workforce has been composed of predominantly non-Hispanic white genetic counselors (Mittman & Downs, 2008). Since the National Society of Genetic Counselors (NSGC) started officially collecting information on respondents' race/ethnicity through the annual Professional Status Survey of genetic counselors, the percentage of respondents who identified as non-Hispanic white has ranged from 90% to 97% between 1992 and 2019. This percentage has not drastically changed over the years. When looking at trends of racial/ethnic minorities in the profession over time, there has been a small increase in the percentage of Hispanic/Latinx individuals in the field while the percentage of Black/African American individuals has stayed relatively constant at about 1%. Since 1994, the percentage of Asian American/Pacific Islander individuals in the field has gradually increased (Channaoui, Bui, et al., 2020). According to NSGC's 2022 Professional Status Survey of genetic counselors, 89% of respondents identified as White, 9% identified as Asian, 3% identified as Hispanic or Latinx, 2% identified as Middle Eastern or North African, 1% identified as Black/African American/African descent, less than 1% identified as American Indian/Alaskan Native/Indigenous Peoples of Canada, and less than 1% identified as Native Hawaiian or Other Pacific Islander. In regards to sexual orientation, 89% of respondents identified as straight, 4% identified as bisexual, and 2% identified as gay or lesbian. 93% of respondents were women while 5% of respondents were men. While the percentage of individuals identifying as men has slightly increased over the past twenty years, this increase is noted as not statistically significant. Among respondents, 17%

reported having a disability, mental illness, chronic illness, or other major medical condition or impairment (NSGC, 2022a). Compared to other healthcare professions such as physicians and social workers, genetic counseling is the least racially and ethnically diverse (Sarmiento, 2019).

To address the lack of diversity in the profession, genetic counseling as a field has made efforts to promote diversity, equity, and inclusion (DEI). For example, NSGC has established special interest groups and diversity task forces to develop strategies for the recruitment of underrepresented groups (URG) into the profession. Some of these strategies included increasing awareness of the field through the development of recruitment brochures and distribution of genetic counseling career packets to colleges (Channaoui, Bui, et al., 2020; Channaoui, Khan, et al., 2020; Mittman & Downs, 2008). In 2022, NSGC created an action plan consisting of DEI initiatives that involve communication, education and training, NSGC's annual conference, policy changes, partnerships and outreach. Additional initiatives include quarterly updates on the progress of the action plan, updating the NSGC website with DEI-related content, developing DEI related training and tools for NSGC members, increasing awareness of genetic counseling through early outreach and community service programs to underrepresented groups, and partnering with organizations that support underrepresented students and genetic counselors to create resources (NSGC, 2022b). One of the organizations that NSGC collaborates with is the Minority Genetic Professionals Network (MGPN) (The Exeter Group, 2021). MGPN is an organization that aims to improve the recruitment of minorities into genetic counseling by increasing awareness of genetic counseling as a field to minority high school and college students. In addition, MGPN provides mentorship to students as they prepare to apply to genetic counseling training programs as well as during their graduate training (Mann, 2020). Along with NSGC, other professional organizations such as the American Board of Genetic Counseling and the Accreditation Council for Genetic

Counseling have developed similar diversity committees and DEI initiatives (Accreditation Council for Genetic Counseling, 2022; American Board of Genetic Counseling, 2022).

Through their own DEI initiatives, many genetic counseling training programs have made a commitment to DEI and the recruitment of individuals from underrepresented groups. For example, a number of genetic counseling training programs have posted statements recognizing and valuing the importance of DEI in their programs (Case Western Genetic Counseling Training Program, n.d.-b; Columbia University Genetic Counseling Graduate Program, n.d.; Ohio State University Genetic Counseling Graduate Program, n.d.; Stanford Master's Program in Human Genetics and Genetic Counseling, n.d.; UConn Genetic Counseling Master's Degree Program, n.d.-b; University of Pennsylvania Master of Science in Genetic Counseling Program, n.d.-b; University of South Carolina Genetic Counseling Program, n.d.; University of Utah Graduate Program in Genetic Counseling, n.d.; Vanderbilt Master of Genetic Counseling Program, n.d.; VCU Genetic Counseling program, n.d.). Many programs have incorporated DEI in their curriculum through lectures and materials provided to students. Students and faculty may also undergo implicit bias trainings (Ohio State University Genetic Counseling Graduate Program, n.d.; Vanderbilt Master of Genetic Counseling Program, n.d.). In addition, there are programs that have their students engage in community outreach to high school and college students from minority backgrounds to spread awareness of genetic counseling (Ohio State University Genetic Counseling Graduate Program, n.d.; Stanford Master's Program in Human Genetics and Genetic Counseling, n.d.; University of South Carolina Genetic Counseling Program, n.d.). When reviewing applications, training programs have started to take a holistic approach to help increase diversity in their cohorts (Boise State University's Master of Science in Genetic Counseling Program, n.d.; Boston University Genetic Counseling Program, n.d.; Case Western Genetic Counseling Training

Program, n.d.-a; JHU/NIH Genetic Counseling Training Program, 2022; Myers et al., 2022; The Medical College of Wisconsin Genetic Counseling Graduate Program, n.d.; UConn Genetic Counseling Master's Degree Program, n.d.-a; UCSF Genetic Counseling Program, n.d.; University of Minnesota Genetic Counseling Program, n.d.; University of Nebraska Medical Center Genetic Counseling Program, n.d.; University of Pennsylvania Master of Science in Genetic Counseling Program, n.d.-a; University of Pittsburgh Genetic Counseling Program, n.d.-b; VCU Genetic Counseling program, n.d.). Holistic review involves looking at the applicant as a “whole”, meaning that an applicant's academics, leadership experiences, and other life experiences are taken into consideration rather than focusing on one factor, such as GPA (Association of American Medical Colleges, 2022). Some programs also offer summer genetic counseling internships to prospective applicants from underrepresented groups in genetic counseling (University of Pennsylvania Master of Science in Genetic Counseling Program, n.d.-b; University of South Carolina Genetic Counseling Program, n.d.). In 2021, several genetic counseling training programs partnered with The Warren Alpert Foundation Alliance to Increase Diversity in Genetic Counseling to aim to increase the number of genetic counselors from underrepresented groups. To accomplish this goal, this partnership is providing full tuition scholarships and cost-of-living stipends for 40 genetic counseling students over the span of five years (University of Pennsylvania, n.d.). In addition, some genetic counseling training programs have their own diversity scholarships for applicants belonging to underrepresented groups (University of Pittsburgh Genetic Counseling Program, n.d.-a; University of South Carolina Genetic Counseling Program, n.d.; VCU Genetic Counseling program, n.d.). Of note, there may be additional DEI initiatives undertaken by other programs that are not apparent through their websites or publications.

While previous studies have characterized the efforts of the field to increase diversity, there has been little research to our knowledge on how these efforts have impacted prospective genetic counseling students. The goal of this study was to explore the experiences of previous genetic counseling program applicants as they navigated through the application process. Specifically, this study examined how genetic counseling applicants incorporate a genetic counseling program's DEI initiatives into their application and match decisions. Another focus of the study was to characterize strengths and barriers of the genetic counseling program admissions process for applicants from URGs. In addition, this study examined any differences in the experiences of applicants from URGs who have matriculated to a program compared to those who have not.

2.2 Methods

2.2.1 Survey Design

The study was approved by the University of Pittsburgh Institutional Review Board (IRB) as an exempt study (Appendix A). The survey consisted of 32 questions about demographic factors, factors that applicants considered when choosing genetic counseling training programs to apply to and/or rank, applicants' experiences during the application process, and application cycle outcomes. Throughout the survey, terms were defined and questions were carefully worded to avoid ambiguity in what the questions were asking (Fowler, 2014). Closed questions such as 5-point Likert scale, multiple choice, and checkbox questions were mostly used in the survey to control for variation in answers across participants and gather quantitative data. When a participant first opened the survey, they were presented with an introductory script that outlined the overview

of the study, topics that the survey would ask about, and eligibility criteria for participation. The script also stated that there were no benefits or risks to participating. In addition, it was stated that responses would be anonymous and that the survey would not be collecting any identifiable information. As a result, participation in the survey would not affect respondents' relationship with the University of Pittsburgh Genetic Counseling Program and respondents' future applications to a genetic counseling training program. Once the participant decided to proceed with the survey, the first two questions verified eligibility for the survey, with the survey ending if the participant did not meet eligibility criteria.

The first section of the survey asked questions regarding demographics. Participants were given a definition of an underrepresented group (URG) in the field of genetic counseling and asked if they self-identified as an URG based on the definition. The definition of an URG that was provided was the following: An individual belonging to an underrepresented group (URG) is an individual who is not a white, able-bodied, heterosexual female. This definition was chosen as it had previously been used in another study and best captured the individuals who were not in the majority in genetic counseling (Majmudar, 2019). The following four multiple choice and checkbox questions asked participants about demographic information and groups with which they identify. Participants had the option of selecting "Prefer not to say" for these four questions. The second section of the survey asked about factors that applicants considered when applying and ranking programs using questions with a 5-point Likert scale. The third section and fourth section used 5-point Likert scale questions to ask additional questions about applying and ranking programs respectively. For each of these sections, there was an open text box for participants to write any factors that they took into consideration that were not listed in the survey. Skip logic was used to skip the fourth section about ranking programs if the applicant indicated that they did not

have the opportunity to rank genetic counseling programs in the previous section. The fifth section asked applicants yes/no, 5-point Likert scale, and checkbox questions about their experiences during the application process as an individual belonging to an URG. Display logic was used to only display this section of questions if an applicant indicated identifying as an underrepresented group in the first section of the survey.

The sixth section of the survey had two questions with open text boxes to collect participants' thoughts on the genetic counseling training programs' admissions process and DEI initiatives. The seventh section of the survey asked multiple choice questions and yes/no questions about participants' most recent application cycle. A copy of the survey text can be found in Appendix B. This survey was created and hosted through the Qualtrics platform. Before the survey was distributed to participants, the survey was piloted with members of the University of Pittsburgh Genetic Counseling Class of 2023 and 2024 as well as the thesis chair.

2.2.2 Participants and Recruitment

This survey was targeted towards genetic counseling applicants from the 2020, 2021, and 2022 genetic counseling program admissions cycles. Participants were eligible to take the survey if they applied to a genetic counseling program in the United States and/or Canada during these three cycles. Current University of Pittsburgh students were not eligible to participate in this study. To recruit these participants, we distributed the survey through the Minority Genetic Professionals Network, an email list of past University of Pittsburgh Genetic Counseling applicants, and the Genetic Counseling Discord. We also sent the survey to genetic counseling program leadership through the Association of Genetic Counseling Program Directors (AGCPD) email listserv for distribution to their past applicants, current students, and previous students who graduated in 2022.

One of the program directors that was contacted through the listserv elected to only distribute the survey to their program's current students and graduating class of 2022. The survey was opened on January 8th, 2023 and closed on February 9th, 2023.

2.2.3 Data Analysis

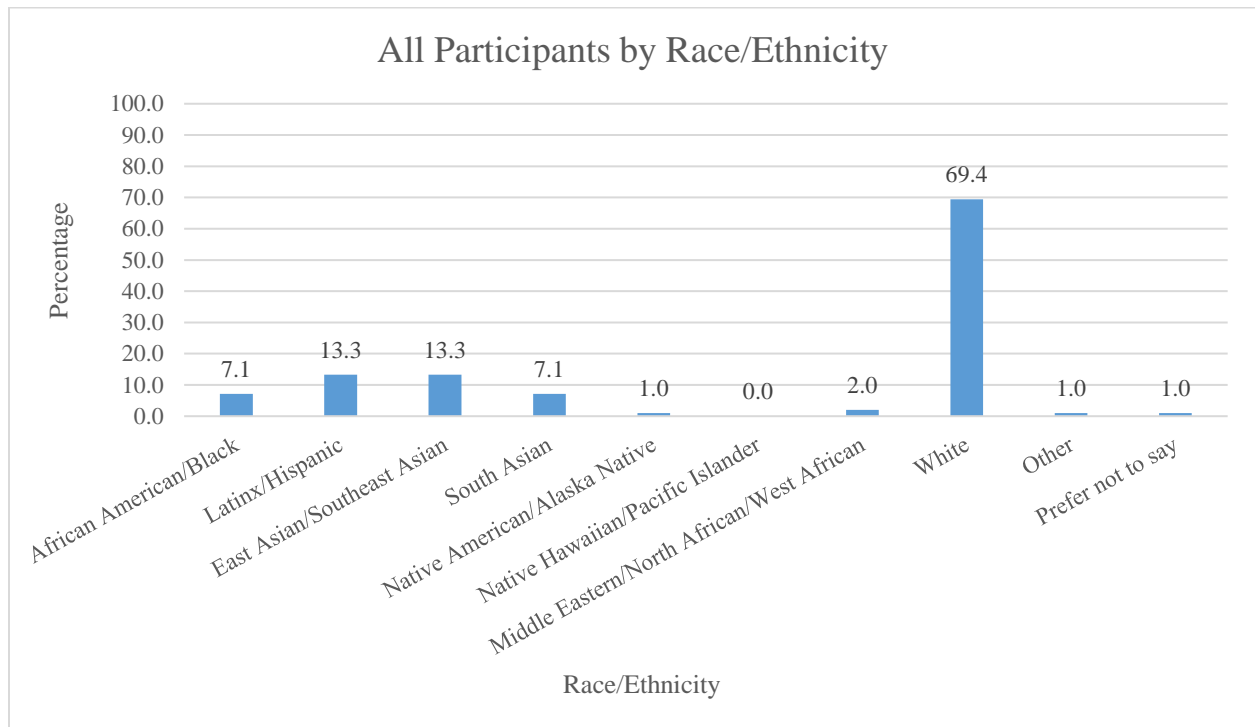
Survey responses were included in the data analysis if participants met the eligibility criteria and answered at least the first two sections of the survey. Data was downloaded from the Qualtrics platform to conduct the data analyses and review the open text responses. Descriptive statistics were performed in Microsoft Excel. For analyses, applicants were categorized as a URG based on their self-identification as a URG as opposed to their answers to the demographics questions. After conducting the initial descriptive analyses, one participant was identified to have had contradictory responses for ranking status and match status. This participant's responses were excluded from the data analysis involving ranking status, match status as well as the matched URG analyses. However, the rest of their responses were included for the analyses of the remaining responses. F-test of equality of variances, two-sample t-test, chi-square test, and Fisher's exact test were conducted using Stata SE 17.0. For these statistical analyses, a p-value less than 0.05 was considered statistically significant.

2.3 Results

2.3.1 Demographics

A total of 108 survey responses were received, of which ten were excluded from analysis for not meeting eligibility requirements or not answering at least the first two sections of the survey. As a result, 98 survey responses were included in the analysis. Out of the 98 survey responses, 85 responses were fully complete while 13 responses were partially completed.

Figure 1 All Participants by Race/Ethnicity



The demographic make-up of all participants is summarized in Figure 1, Figure 2, and Table 1. About 61.2% (n = 60) of participants self-identified as an URG while 38.8% (n = 38) of participants did not. In terms of race/ethnicity, most participants identified as White (69.4%, n =

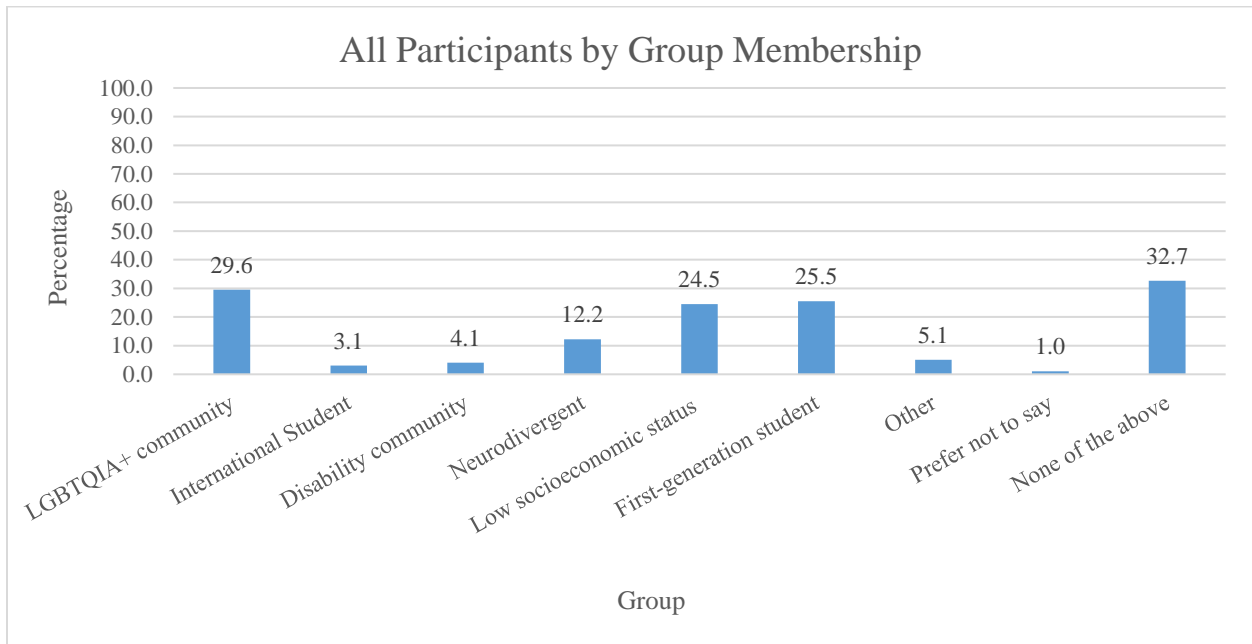
68), followed by 13.3% (n = 13) Latinx/Hispanic, 13.3% (n = 13) East Asian/Southeast Asian, and 7.14% (n = 7) African American/Black. One individual selected “Other” and identified as Filipino. Participants were also asked about groups in which they identify. For all participants, the three groups with the highest percentage of participant membership were the LGBTQIA+ community (29.6%, n = 29), first-generation students (25.5%, n = 25), and low socioeconomic status (24.5%, n = 24). Five individuals selected “Other” for group membership, with write-in responses including being an undocumented student, a religious minority, the first generation to attend college but not the first generation in terms of immigration, a member of the chronic illness community, and an individual living in a rural area. For both race/ethnicity as well as group membership, individuals could select more than one option so the percentages do not total to 100%. 14 individuals identified as two or more races while 26 individuals selected two or more groups in which they identify. The majority of respondents were in their twenties with about 51% (n = 50) of respondents being 20 to 24 years old, followed by 36.7% (n = 36) of respondents being 25 to 29 years old. Most participants identified as cisgender women (93.9%, n = 92); 3.1% (n = 3) of participants identified as cisgender men while 3.1% (n = 3) of participants identified as nonbinary.

Table 1 Additional Demographics for All Participants

All Participants

Demographic	Value	Count (n)	Percentage
Age	Under 20 years old	0	0.0%
	20 to 24 years old	50	51.0%
	25 to 29 years old	36	36.7%
	30 to 34 years old	7	7.1%
	35 to 39 years old	3	3.1%
	40+ years old	1	1.0%
	Prefer not to answer	1	1.0%
Gender Identity	Cisgender Man	3	3.1%
	Cisgender Woman	92	93.9%
	Transgender Man	0	0.0%
	Transgender Woman	0	0.0%
	Non-binary	3	3.1%
	Prefer to self-describe	0	0.0%
	Prefer not to say	0	0.0%

Figure 2 All Participants by Group Membership



When separating all participants based on their URG status, about half of URGs identified as White (53.3%, n = 32). 21.7% (n = 13) of participants from URGs identified as Latinx/Hispanic, 20% (n = 12) identified as East Asian/Southeast Asian, and 11.7% (n = 7) identified as African American/Black (Figure 3). 13 individuals (21.7%) identified as two or more races. In regards to groups that individuals identified with, the three groups with the largest percentage of membership were the LGBTQIA+ community (46.7%, n = 28), low socioeconomic status (33.3%, n = 20), and first-generation students (31.7%, n = 19) (Figure 4). 23 individuals identified as belonging to two or more groups. The ages of most participants from URGs were either between 20 to 24 years old (46.7%, n = 28) or 25 to 29 years old (41.7%, n = 25) (Appendix C Table 1). 90% (n = 54) of participants identified as cisgender women (93.9%, n = 92); 5% (n = 3) of participants identified as cisgender men while 5% (n = 3) of participants identified as nonbinary (Appendix C Table 1).

When looking at the demographic makeup of non-URGs, most individuals were White (94.7%, n = 36) (Appendix C Table 2). One individual identified as East Asian/Southeast Asian, one individual identified as South Asian, and one selected “Prefer not to say”. In terms of group membership, 57.9% (n = 22) of participants selected “None of the above” for the identities listed in the answer choices (Figure 5). Six individuals (15.8%) identified as being a first-generation student, 4 individuals (10.5%) identified as being in a low socioeconomic status group, and 3 individuals (7.9%) identified as being neurodivergent. While some of these participants would be considered as part of a URG based on their ethnicity/race or group membership, they were still considered as a non-URG for the data analyses as they did not self-identify as an URG when completing the survey. Similar to the participants from URGs, the ages of most non-URGs were either between 20 to 24 years old (57.9%, n = 22) or 25 to 29 years old (28.9%, n = 11). All participants from non-URG identified as being cisgender women.

Figure 3 Participants from URGs by Race/Ethnicity

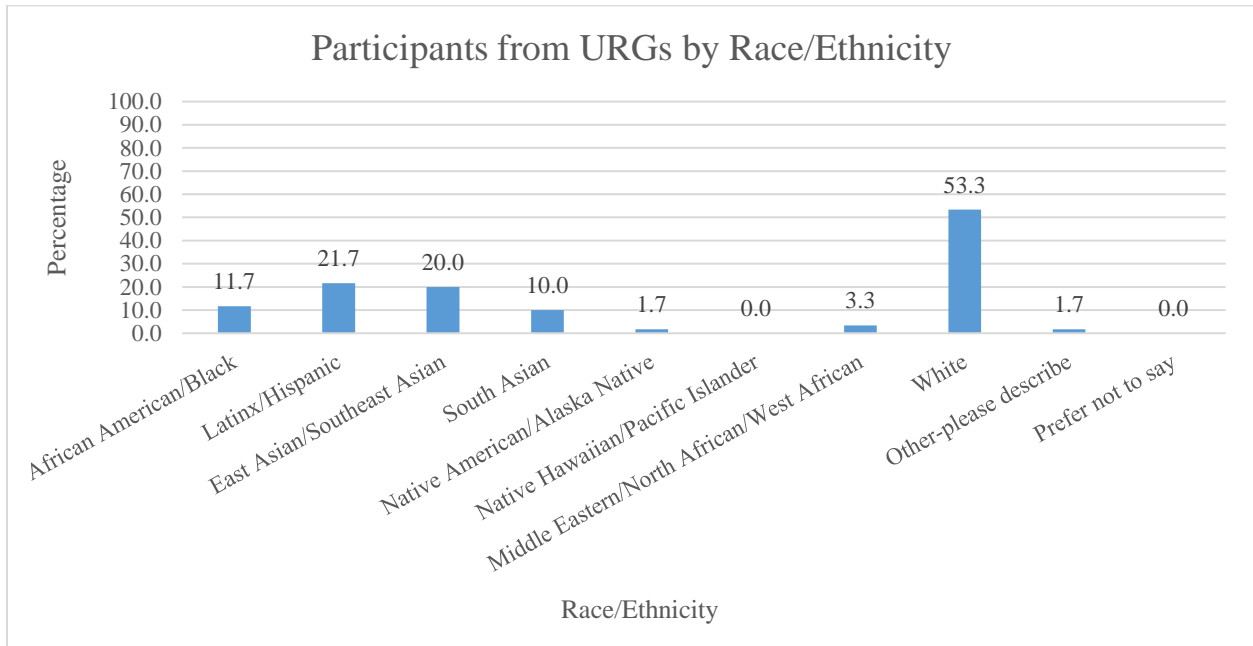


Figure 4 Participants from URGs by Group Membership

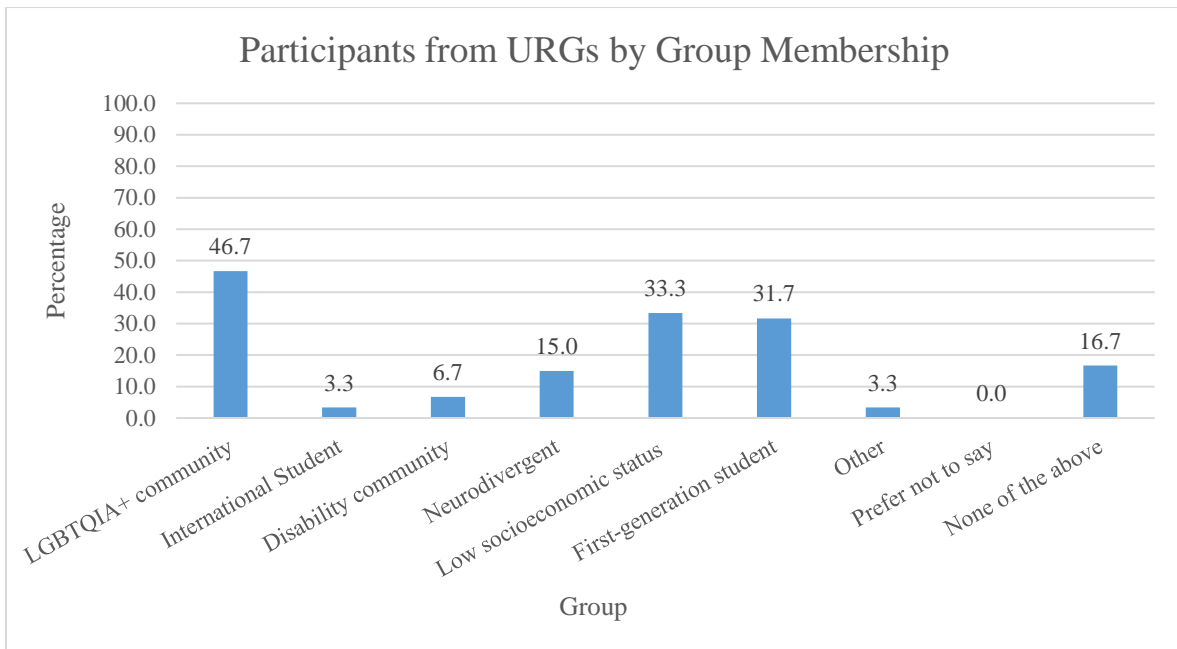
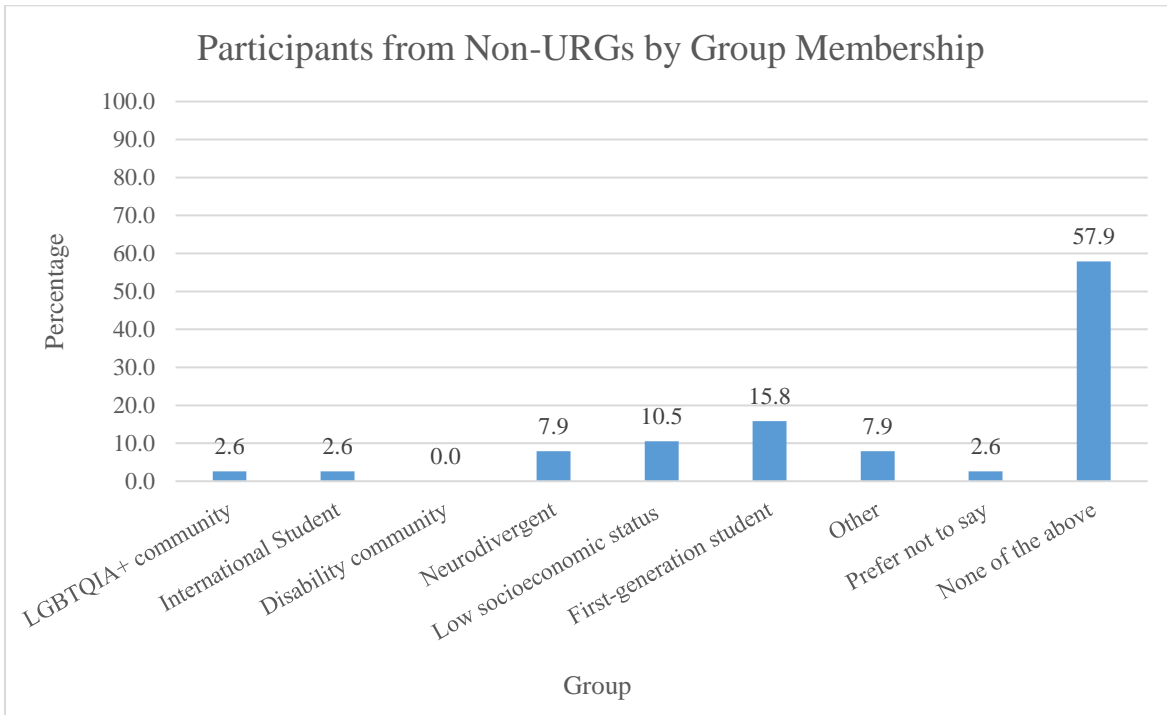


Figure 5 Participants from Non-URGs by Group Membership

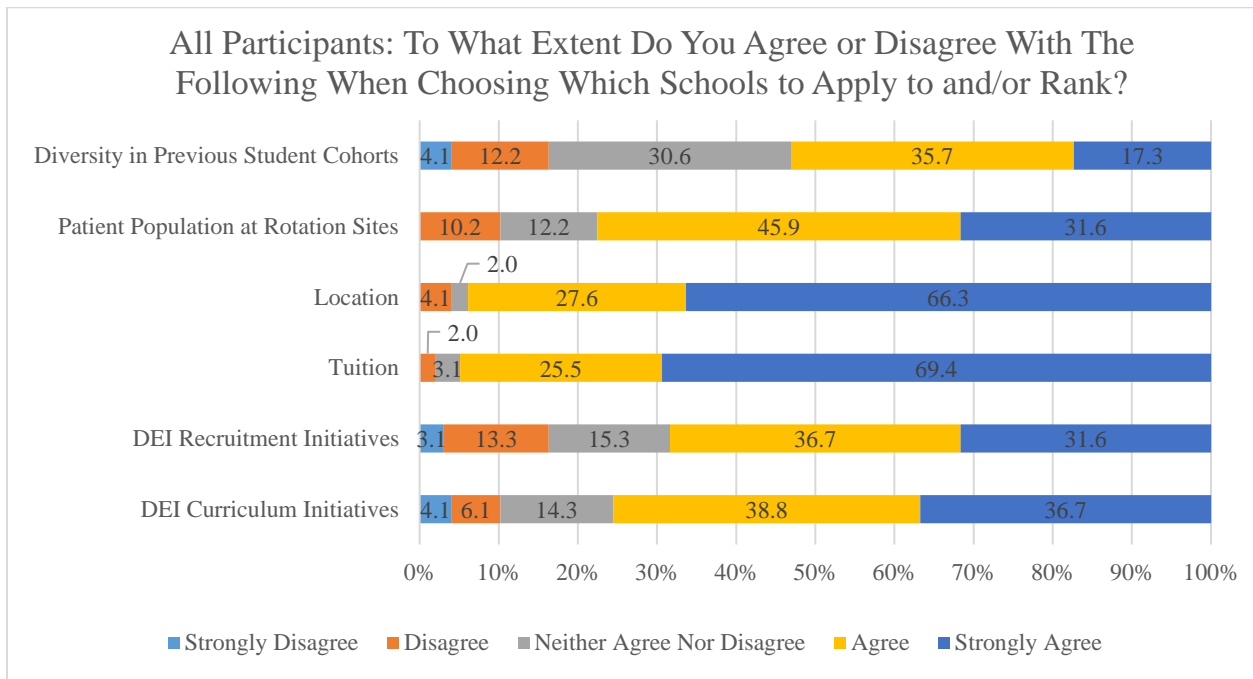


2.3.2 All Participants

During the survey, participants were asked to indicate the importance of six different factors (i.e. a program’s DEI curriculum initiatives, a program’s DEI recruitment initiatives, a program’s location, a program’s tuition, the patient population at a program’s rotation sites, and the diversity in a program’s previous student cohorts) when choosing which genetic counseling training programs to apply to and/or rank. Most participants (75.5%, n = 74) agreed or strongly agreed that a program’s DEI curriculum initiatives were important to them when applying and/or ranking. 68.4% (n = 67) of participants agreed or strongly agreed that a program’s DEI recruitment initiatives were important to them. A program’s tuition had the highest percentage of respondents agreeing or strongly agreeing about its importance to them (94.9%, n = 93). A program’s location had the second highest percentage of participants agreeing or strongly agreeing about its

importance to them (93.9%, n = 92). Out of the six factors, the diversity in a program’s previous student cohorts was the factor that had the highest percentage of neutral responses (30.6%, n = 30); 53% (n = 52) of participants agreed or strongly agreed about this factor’s importance while 16% (n = 16) disagreed or strongly disagreed about its importance to them (Figure 6).

Figure 6 All Participants: Considering Factors When Choosing Schools to Apply To and Rank



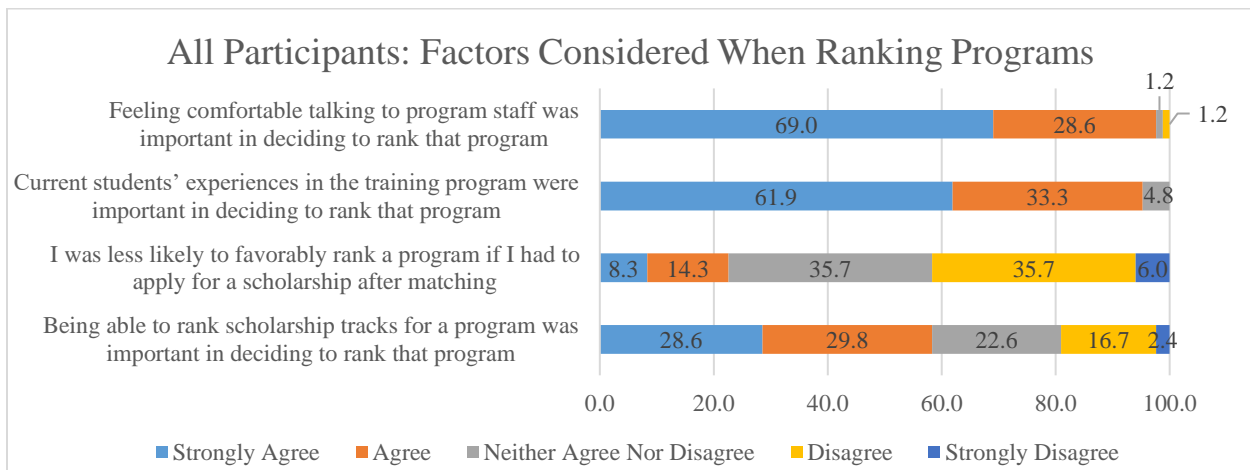
When asked about specific factors considered when deciding how to rank programs, feeling comfortable talking to program staff was the factor with the highest percentage of participants agreeing or strongly agreeing (97.6%, n = 82) about its importance during ranking (Figure 7). Most participants agreed or strongly agreed that current students’ experiences in the program were important in deciding to rank that program (95.2%, n = 80). The majority of participants agreed or strongly agreed that being able to rank scholarship tracks for a program was important in deciding to rank that program (58.3%, n = 49). When asked if they were less likely to favorably rank a

program if they had to apply for a scholarship after matching, most applicants either disagreed/strongly disagreed (41.7%, n = 35) or felt neutral (35.7%, n = 30).

Table 2 Factors Considered When Ranking Programs for All Participants

Question: Did you have the opportunity to rank genetic counseling programs in the NMS Match System?		
Response	Counts	Percentage
Yes	86	92.5%
No	7	7.5%
	93	
Question: Did you choose not to rank a program based on their DEI initiatives?		
Response	Counts	Percentage
Yes	3	3.6%
No	81	96.4%
	84	

Figure 7 All Participants Factors Considered When Ranking Programs



In regards to DEI, 47.9% (n = 45) of participants were easily or very easily able to find information on a program's DEI initiatives on their website, 20.2% (n = 19) of participants found it difficult to find this information, and 31.9% of participants were neutral (n = 30) (Figure 8). When asked if a program's application questions about DEI were important in deciding to apply to that program, 34% (n = 32) of participants agreed or strongly agreed, 35.1% (n = 33) of participants neither agreed nor disagreed, and 30.9% (n = 29) of participants disagreed or strongly disagreed (Figure 9). During a program's interview day, most participants said it was likely or very likely that a program shared information about their DEI initiatives (77.4%, n = 65) (Figure 10).

When asked about how many genetic counseling training programs they applied to, participants most frequently selected 7-8 programs (30.6%, n = 26), followed by 5-6 programs (17.6%, n = 15) (Appendix C Table 3). The highest percentage of respondents received one to two interview invitations (30.6%, n = 26), with the second most frequent response being three to four interviews (23.5%, n = 20). In terms of undergraduate GPA, 40% of all participants (n = 34) reported a GPA between 3.76 and 4.00. 42.3% (n = 36) of all participants were reapplicants, with 1.31 being the average number of times reapplicants applied. 79.8% (n = 67) of all participants matched to a program while 20.2% (n = 17) of participants did not.

Figure 8 All Participants Ease of Finding Information on DEI Initiatives

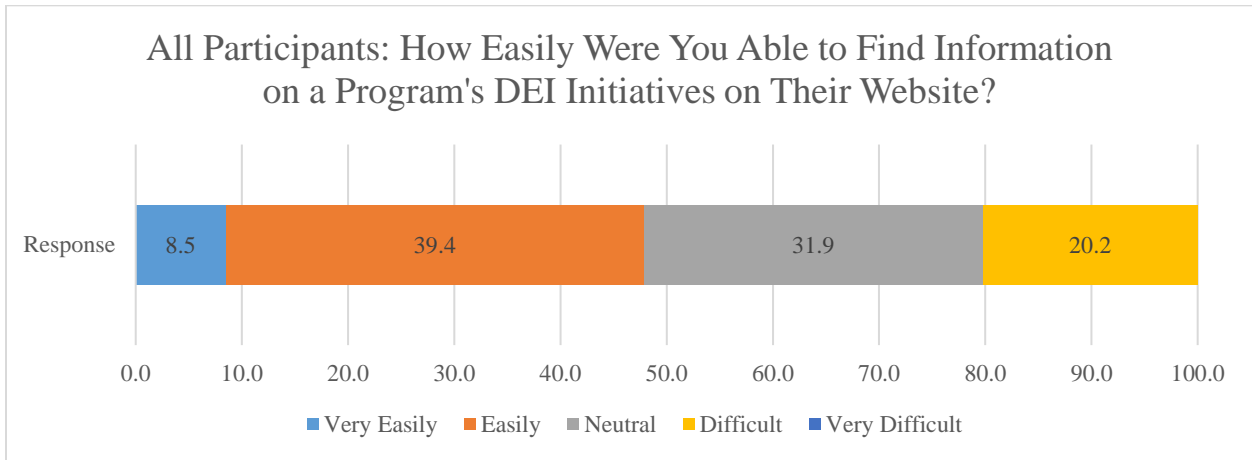


Figure 9 All Participants Importance of DEI Application Questions

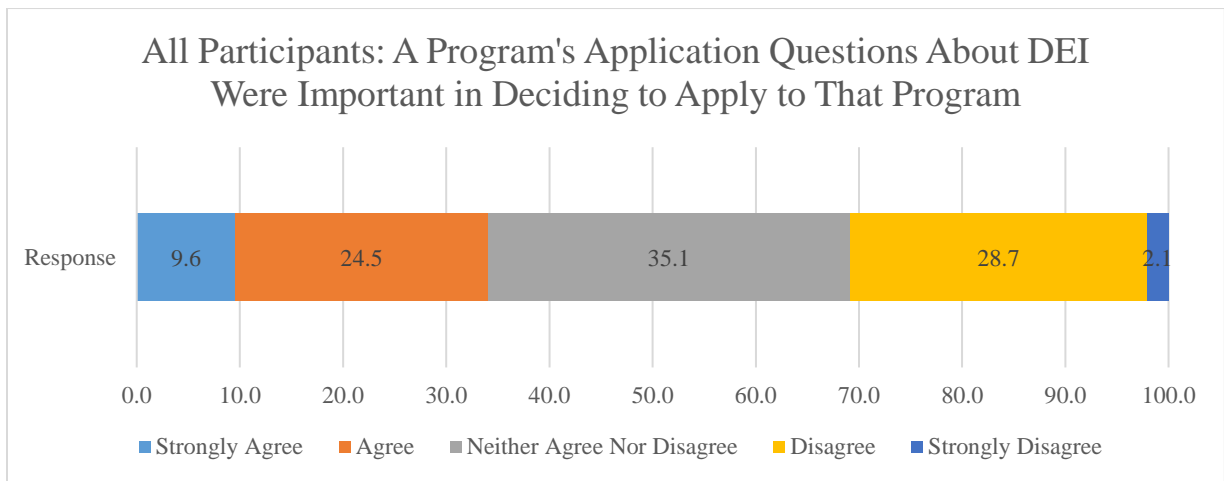
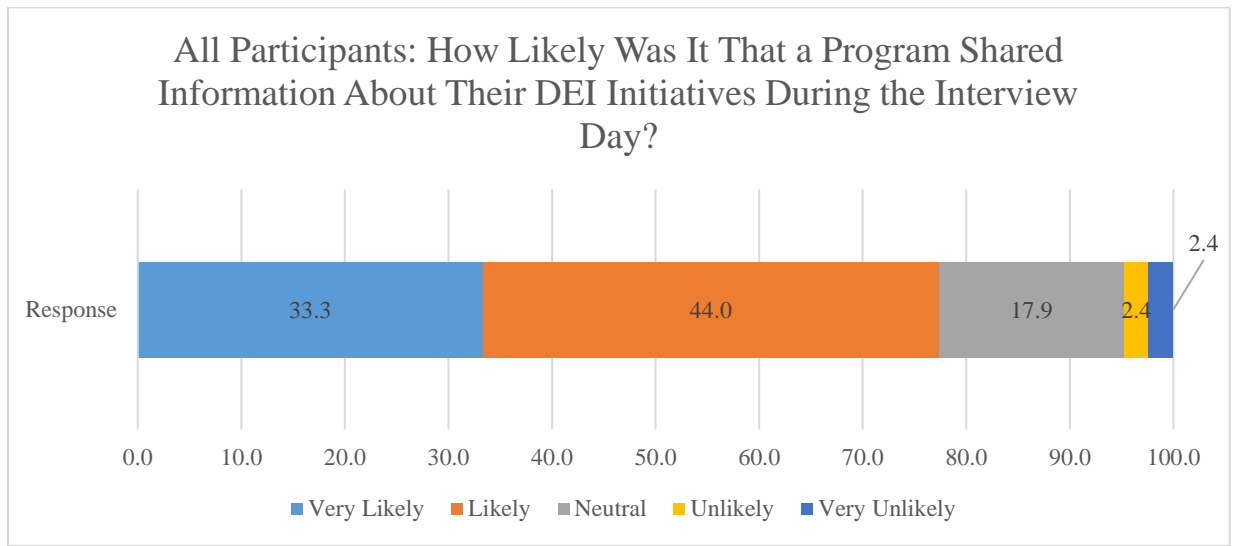


Figure 10 All Participants Likelihood of Program Sharing DEI Initiatives During Interviews



2.3.3 Experiences of URGs

In order to learn more about the experiences of applicants from URGs during the admissions process, there were a subset of survey questions that only URGs could answer; these responses are summarized in Table 3. One question asked if participants felt comfortable with sharing information on how they identify if a program had asked about it at some point during the admissions process. Most respondents from URGs responded yes (82.1%, n = 46), while 17.9% of participants from URGs said no (n = 10). If asked about their identity, 64.3% (n = 36) of URGs felt that the questions were able to fully capture the groups in which they identified. If made aware that a program was asking about identity to improve DEI efforts, 46.4% (n = 26) of respondents were unsure if that would make them more comfortable in sharing their identity. 39.3% (n = 22) of participants felt that this would make them more comfortable while 14.3% (n = 8) of participants felt that this would not make them more comfortable. Half of the participants (n = 28) either disagreed or strongly disagreed that their identity hindered them in the admissions process. 23.2%

(n = 13) either agreed or strongly agreed that their identity hindered them in the admissions process while 26.8% (n = 15) of participants were neutral.

Out of a list of factors, participants from URGs were asked to select which factors would make them more comfortable in sharing their identity. The factor that was selected most frequently was diversity in program staff and leadership (87.5%, n = 49), followed by diversity in past cohorts (73.2%, n = 41). 60.7% (n = 34) of respondents chose demographic questions with inclusive answer choices while 58.9% (n = 33) selected a program's DEI initiatives. Seven individuals elected to write in other factors that were not listed in the question's answer choices. One participant said that they would feel more comfortable sharing their identity if "faculty [shared] their identity when appropriate and voluntary" such as "sharing pronouns". Another participant commented that many programs' "statements were focused on visible minority groups, so it often made [them] feel like [the programs] were mostly interested in students [who] would visually appear as part of a minority". This made this participant feel that the programs "cared more about how the cohort would look to others" rather than "want[ing] to include any minoritized individual". A participant shared that they "personally felt more comfortable when minority staff asked [them] about [their] identity, or if someone asked [them] how [their] identity has shaped [their] perspective into the genetic counseling field" as this made it "less personal" and made them feel "less vulnerable".

Table 3 URG Experiences

<i>Question: If a program asked you about how you identify at some point during the admissions process, were you comfortable with sharing that information?</i>		
Response	Counts	Percentage
Yes	46	82.1%
No	10	17.9%
	56	
<i>Question: If asked about your identity, do you feel that the questions were able to fully capture the groups in which you identify?</i>		
Response	Counts	Percentage
Yes	36	64.3%
No	20	35.7%
	56	
<i>Question: If you knew a program was asking about identity to improve DEI efforts, would that make you more comfortable in sharing your identity?</i>		
Response	Counts	Percentage
Yes	22	39.3%
No	8	14.3%
Unsure	26	46.4%
	56	
<i>Question: What factors would make you more comfortable sharing your identity?</i>		
Factor (select all that apply)	Counts	Percentage
A program's DEI initiatives	33	58.9%
Diversity in Past Cohorts	41	73.2%
Diversity in Program Staff and Leadership	49	87.5%
Demographic Questions with Inclusive Answer Choices	34	60.7%
Other	7	12.5%
<i>Question: I felt that my identity hindered me in the admissions process</i>		
Response	Counts	Percentage
Strongly Agree	1	1.8%
Agree	12	21.4%
Neither Agree Nor Disagree	15	26.8%
Disagree	24	42.9%
Strongly Disagree	4	7.1%
	56	

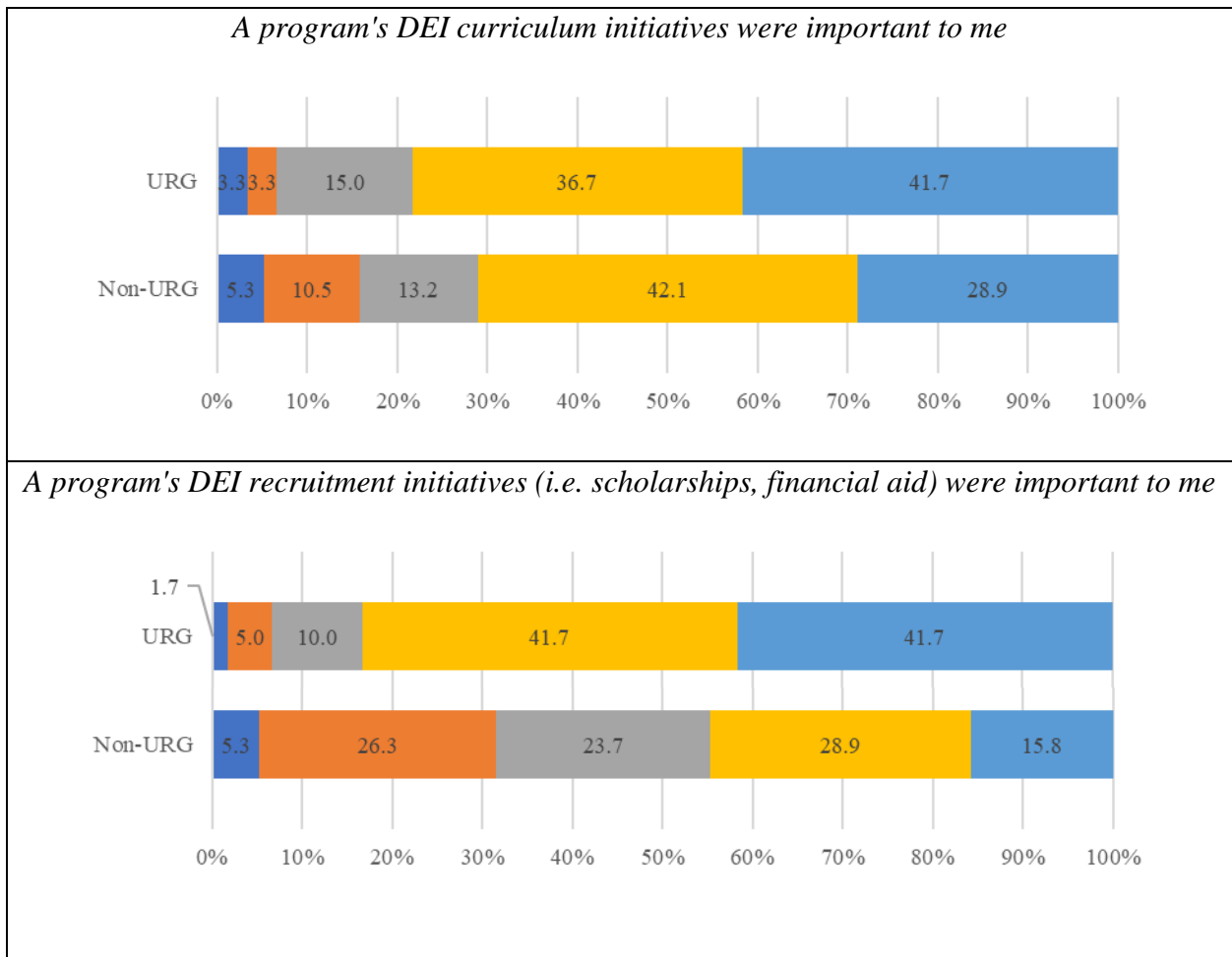
2.3.4 Comparison of URGs and Non-URGs

The responses of participants from URGs and non-URGs were compared across all the survey questions. Participants were first asked to indicate the importance of six different factors when choosing which genetic counseling training programs to apply to and/or rank (Figure 11). For a program's tuition, 76.7% (n = 46) of participants from URGs strongly agreed about its importance and 18.3% (n = 11) of participants from URGs agreed about its importance; in comparison, 57.9% (n = 22) of non-URGs strongly agreed about its importance and 36.8% (n = 14) of non-URGs agreed about its importance. Most URGs (90%, n = 54) and all non-URGs (100%, n = 38) agreed or strongly agreed about the importance of a program's location. 35% (n = 21) of URGs strongly agreed and 43.3% (n = 26) of non-URGs agreed that the patient population at a program's rotation sites was important to them; 26.3% (n = 10) of non-URGs strongly agreed and 50% (n = 19) of non-URGs agreed about this factor's importance. There were no statistically significant differences between participants from URGs and non-URGs for any of these factors. A two-sample t-test with equal variances did find a statistically significant difference between the participants from URGs and non-URGs in regards to the importance of a program's DEI recruitment initiatives ($p < 0.0001$). For a program's DEI recruitment initiatives, 83.3% (n = 50) of URGs agreed or strongly agreed about this factor's importance while 6.7% (n = 4) disagreed or strongly disagreed. In contrast, 44.7% (n = 17) of non-URGs agreed or strongly agreed about this factor's importance while 31.6% (n = 12) disagreed or strongly disagreed. For the importance of the diversity in a program's previous student cohorts, a two-sample t-test with equal variances also found a statistically significant difference between participants from URGs and non-URGs ($p = 0.0473$). For participants from URGs, 23.3% (n = 14) strongly agreed, 35% (n = 21) agreed, and 28.3% (n = 17) were neutral about the importance of the diversity in a program's previous student

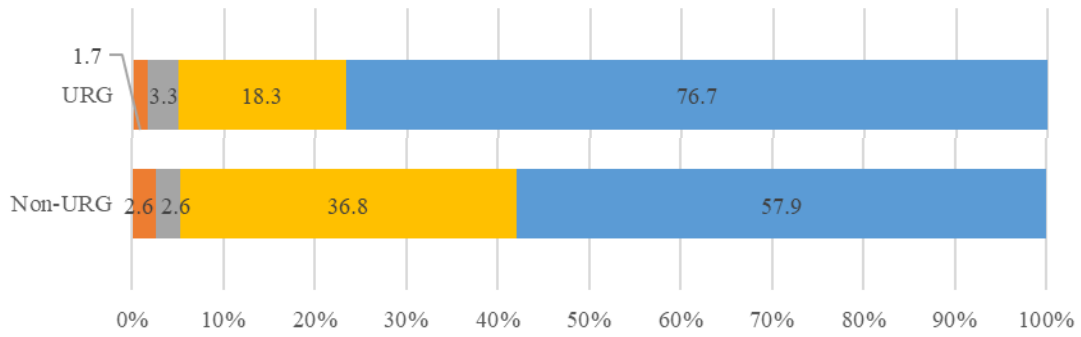
cohorts. For participants from non-URGs, 7.9% (n = 3) strongly agreed, 36.8% (n = 14) agreed, and 34.2% (n = 13) were neutral about the diversity in a program’s previous student cohort being important to them.

Figure 11 URGs vs Non-URGs: Considering Factors When Choosing Schools to Apply To And Rank

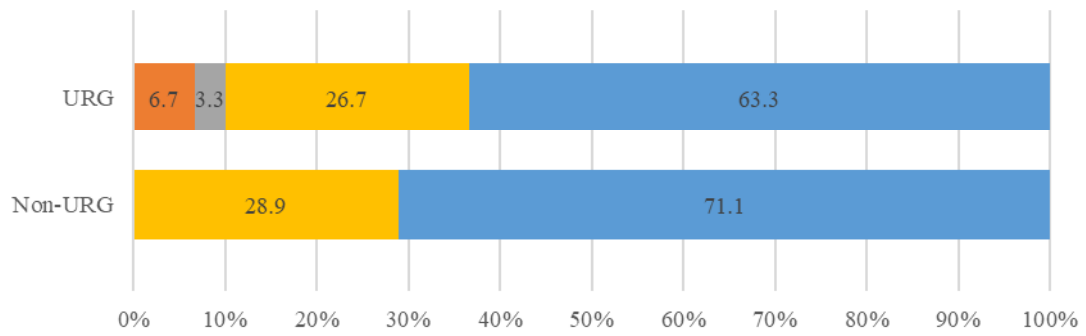
URGs vs Non-URGs: To What Extent Do You Agree or Disagree With The Following When Choosing Which Schools to Apply to and/or Rank?



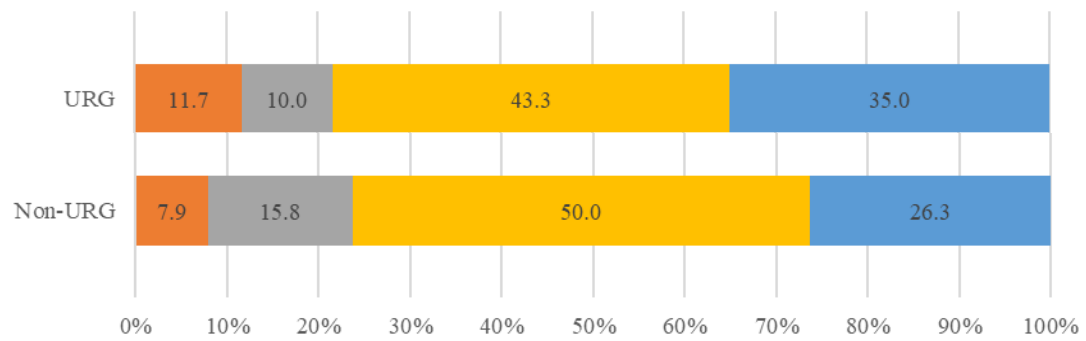
A program's tuition was important to me

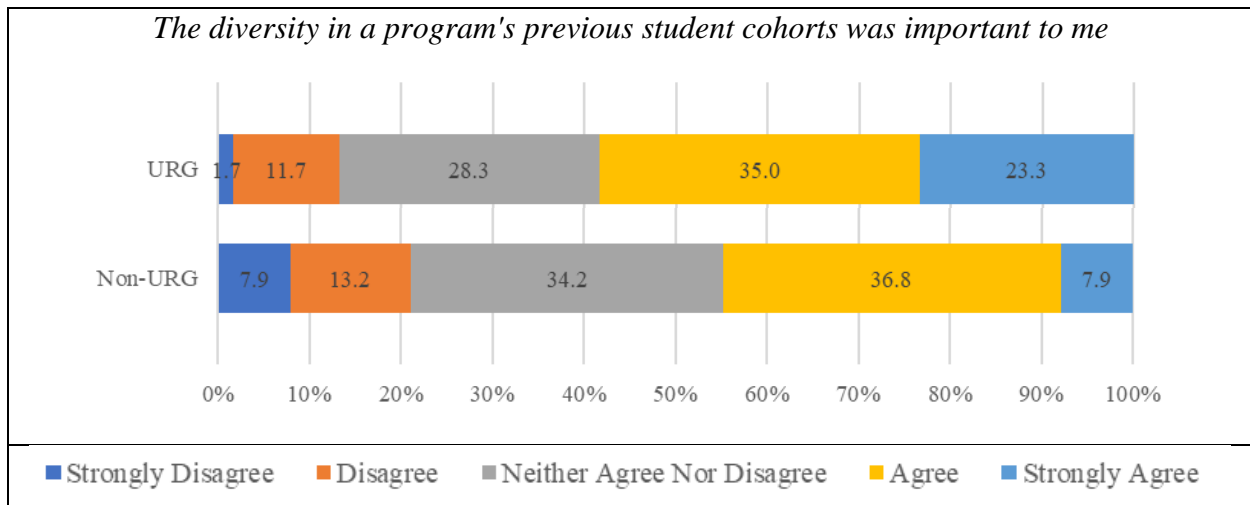


A program's location was important to me



The patient population at a program's rotation sites was important to me





When asked about specific factors considered when ranking programs, feeling comfortable talking to program staff was the factor with the highest percentage of participants from URGs (96.1%, n = 49) and non-URGs (100%, n = 33) agreeing or strongly agreeing about its importance during ranking (Appendix C Table 4). Most participants from URGs (96.1%, n = 49) and non-URGs (93.9%, n = 31) agreed or strongly agreed that current students' experience in the program were important in deciding to rank that program (95.2%, n = 80). Compared to the participants from URGs for both of these factors, the participants from non-URGs had a larger percentage difference between those who strongly agreed and those who agreed about these factors' importance. However, there were no statistically significant differences between the groups for either of these factors. Compared to the non-URGs (51.5%, n = 17), a higher percentage of URGs (62.7%, n = 32) strongly agreed or agreed that being able to rank scholarship tracks for a program was an important factor in deciding to rank that program; however, this difference was not statistically significant. When asked if they were less likely to favorably rank a program if they had to apply for a scholarship after matching, 29.4% (n = 15) of URGs agreed or strongly agreed while 39.2% (n = 20) disagreed or strongly disagreed. For the same factor, 12.1% (n = 4) of non-URGs agreed or strongly agreed while 45.5% disagreed or strongly disagreed. The difference in

responses between these two groups was not statistically significant. 5.9% (n = 3) of participants from URGs chose to not rank a program based on their DEI initiatives compared to 0% of participants from non-URGs; however, Fisher’s exact test did not indicate a statistically significant difference between the groups.

When asked if a program’s application questions about DEI were important in deciding to apply to that program, a two-sample t-test with equal variances showed a statistically significant difference between URGs and non-URGs (p = 0.0362). For this factor, 41.4% (n = 24) of participants from URGs agreed or strongly agreed about this factor’s importance while 24.1% (n = 14) disagreed; for participants from non-URGs, 22.2% (n = 8) agreed or strongly agreed about this factor’s importance while 41.7% (n = 15) disagreed or strongly disagreed (Table 4).

Table 4 URG vs Non-URG for the Importance of a Program’s DEI Application Questions During Applying

<i>Question: A program's application questions about DEI were important in deciding to apply to that program.</i>				
	URG		Non-URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	7	12.1	2	5.6
Agree	17	29.3	6	16.7
Neither Agree Nor Disagree	20	34.5	13	36.1
Disagree	13	22.4	14	38.9
Strongly Disagree	1	1.7	1	2.8
	58		36	
<i>Two-sample t-test: p-value = 0.0362</i>				

There were no significant differences between participants from URGs and non-URGs in the number of genetic counseling programs applied to, number of interview invitations received, and undergraduate GPA (Appendix C Table 5). For participants from URGs, 84.9% (n = 45) of participants matched to a program while 15.1% (n = 8) did not; in comparison, about 71% (n = 22)

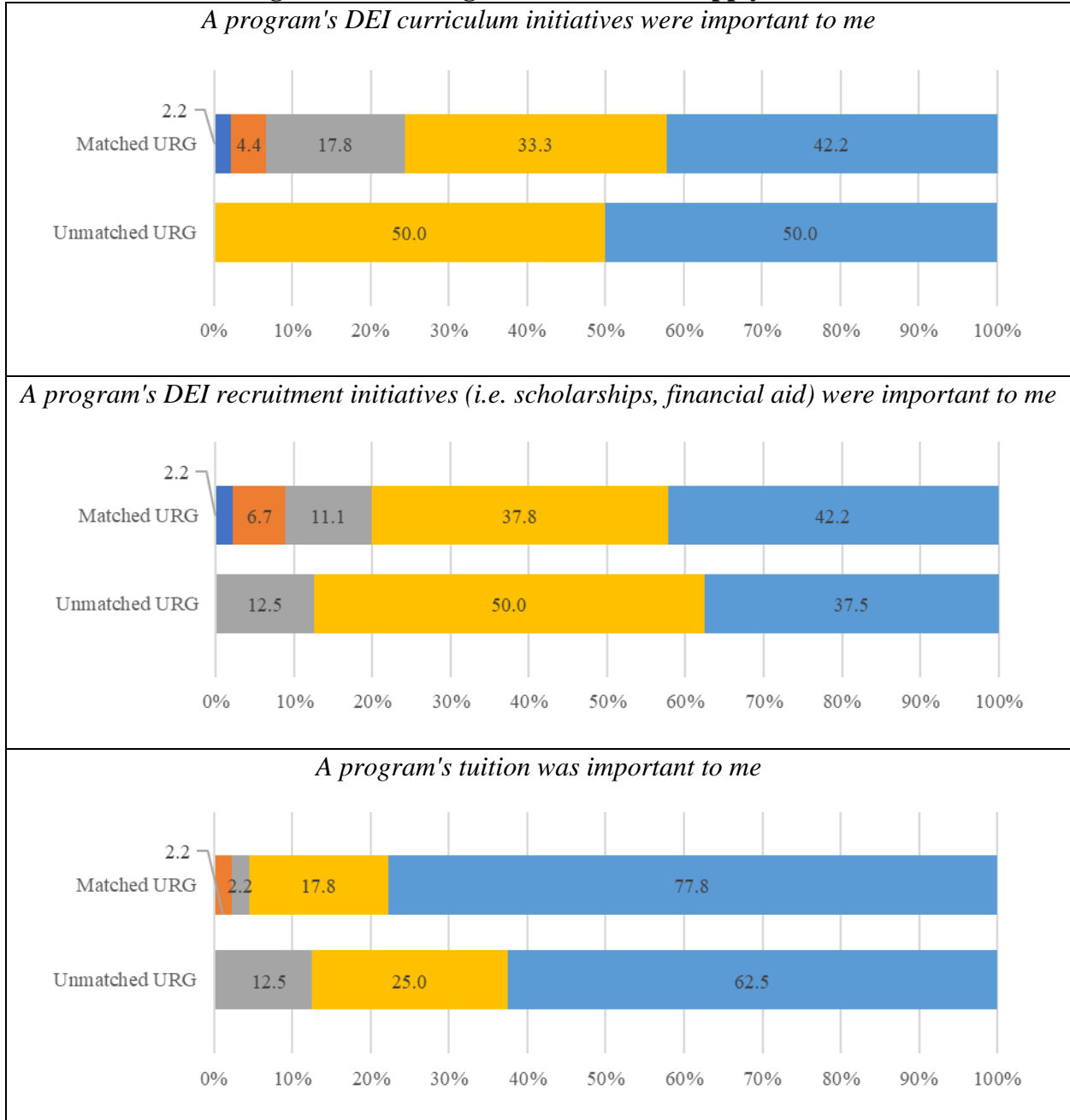
of participants from non-URGs matched to a program while 29% (n = 9) did not (Appendix C Table 5). This difference was not statistically significant by a chi-square test.

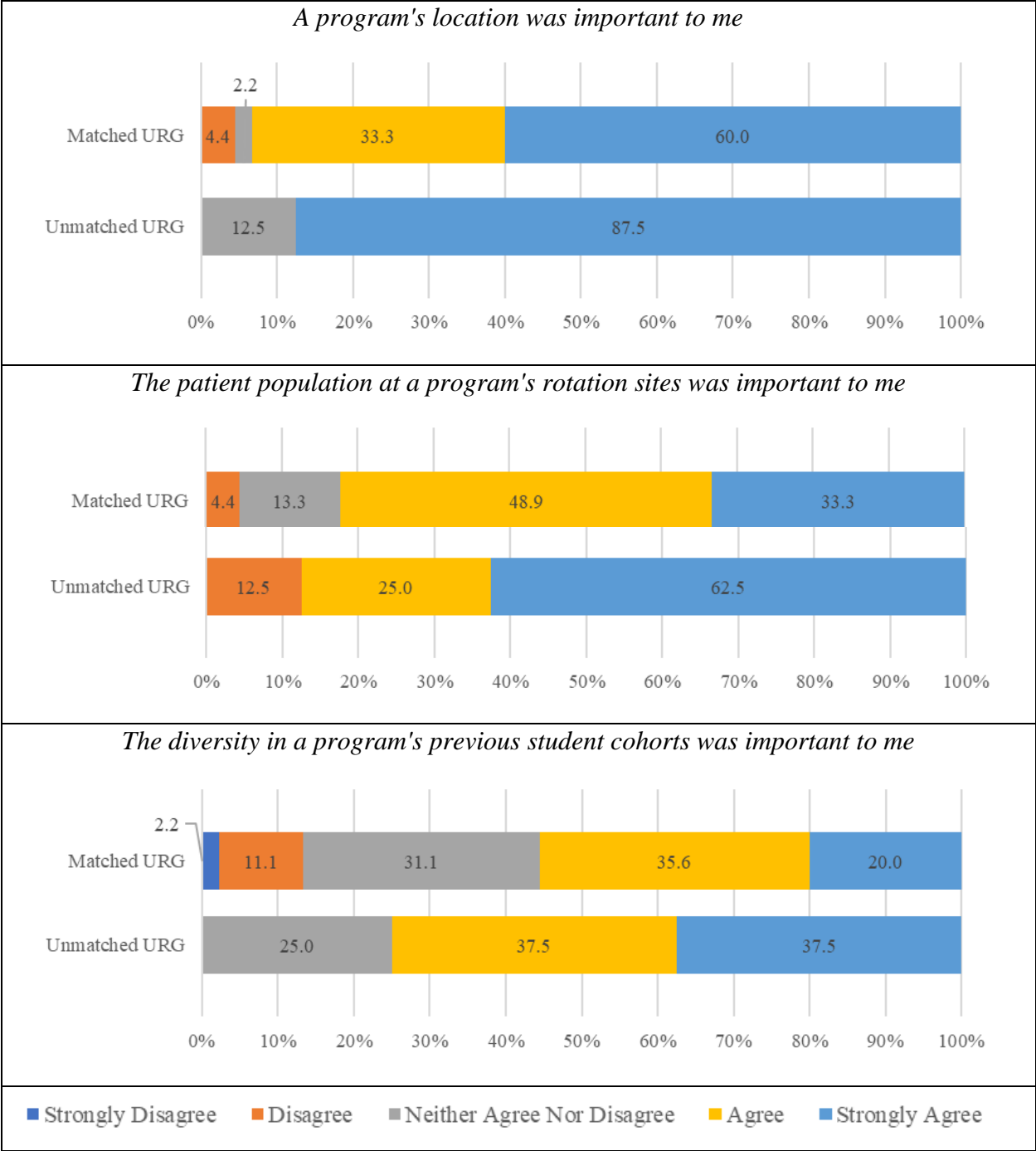
2.3.5 Comparison of Matched URGs and Unmatched URGs

The responses of matched URGs and unmatched URGs were compared across all the survey questions. There were 45 matched URGs and 8 unmatched URGs. Both groups of participants first answered questions regarding the importance of six different factors when choosing which genetic counseling training programs to apply to and/or rank (Figure 12). 75.6% (n = 34) of matched URGs agreed or strongly agreed that a program's DEI curriculum initiatives were important to them compared to 100% (n = 8) of unmatched URGs. The majority of both matched URGs (80%, n = 36) and unmatched URGs (87.5%, n = 7) agreed or strongly agreed that a program's DEI recruitment initiatives were important to them. 87.5% (n = 7) of unmatched URGs and 95.6% (n = 43) of matched URGs agreed or strongly agreed that a program's tuition was important to them. Similarly, 87.5% (n = 7) of unmatched URGs and 93.3% (n = 42) of matched URGs agreed or strongly agreed that a program's location was important to them. For matched URGs, 48.9% (n = 22) agreed and 33.3% (n = 15) strongly agreed that the patient population at a program's rotation sites was important to them. 62.5% (n = 5) of unmatched URGs strongly agreed and 25% (n = 2) of unmatched URGs agreed about the importance of the same factor. 55.6% (n = 25) of matched URGs and 75% (n = 6) of unmatched URGs agreed or strongly agreed that the diversity in a program's past student cohorts was important to them. For all of these six factors, a two-sample t-test did not find any significant differences between matched URGs and unmatched URGs.

Figure 12 Matched URGs vs Unmatched URGs: Considering Factors When Choosing Schools to Apply To and Rank

Matched URGs vs Unmatched URGs: To What Extent Do You Agree or Disagree With The Following When Choosing Which Schools to Apply to and/or Rank?





Most matched URGs (84.4%, n = 38) and unmatched URGs (62.5%, n = 5) said that they felt comfortable sharing how they identified if a program had asked at some point during the admissions process. If asked about their identity, 64.4% (n = 29) of matched URGs felt that the questions were able to fully capture the groups in which they identified as opposed to 35.6% (n =

16) who did not. In comparison, half (n = 4) of unmatched URGs felt that the questions were able to fully capture the groups in which they identified if asked about their identity. When asked if participants would be more comfortable in sharing their identity if they knew a program was asking to improve DEI efforts, the response with the highest percentage was “Unsure” for both matched URGs (46.7%, n = 21) and unmatched URGs (62.5%, n = 5). A Fisher’s exact test run for these three items showed no significant differences between both groups of participants. 62.5% (n = 5) of unmatched URGs agreed that their identity hindered them in the admissions process while 37.5% (n = 3) felt neutral (Table 5). In contrast, 17.8% (n = 8) of matched URGs agreed or strongly agreed that their identity hindered them, 22.2% (n = 10) felt neutral, and 60% (n = 27) disagreed or strongly disagreed that their identity hindered them. A two-sample t-test indicated that this was a statistically significant difference between these two groups (p = 0.0022).

Table 5 Matched URG vs Unmatched URG Identity Hindering in Admissions Process

<i>Question: I felt that my identity hindered me in the admissions process</i>				
	Matched URG		Unmatched URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	1	2.2	0	0.0
Agree	7	15.6	5	62.5
Neither Agree Nor Disagree	10	22.2	3	37.5
Disagree	23	51.1	0	0.0
Strongly Disagree	4	8.9	0	0.0
	45		8	
<i>Two-sample t-test: p-value = 0.0022</i>				

Both sets of participants were asked about specific factors considered when deciding how to rank programs (Appendix C Table 6). All unmatched URGs (n = 5) and 95.6% (n = 43) of matched URGs agreed or strongly agreed about current students’ experiences in the training program being important in deciding to rank that program. When taking into account feeling

comfortable talking to program staff, 100% (n = 5) of unmatched URGs and 95.6% (n = 43) of matched URGs also agreed or strongly agreed about the importance of this factor when deciding to rank that program. 64.4% (n = 29) of matched URGs and 60% (n = 3) of unmatched URGs agreed or strongly agreed that being able to rank scholarship tracks for a program was important in deciding to rank that program. There were no significant differences between these groups across any of these factors.

There were no significant differences between matched URGs and unmatched URGs in the number of genetic counseling programs applied to and undergraduate GPA (Appendix C Table 7). A two-sample t-test did show a statistically significant difference in the number of interview invitations received between matched URGs and unmatched URGs ($p = 0.0001$). All unmatched URGs received anywhere between zero to four interview invitations; in comparison, 47.7% (n = 21) of matched URGs received between zero and four interview invitations. For the remaining matched URGs, 20% (n = 9) of participants received 5-6 interview invitations, 24.4% (n = 11) received 7-8 interview invitations, 6.7% (n = 3) received 9-10 interview invitations, and 2.2% (n = 1) received more than 10 interview invitations.

2.3.6 Open-Ended Responses

The survey included multiple open-text boxes for participants to express any thoughts that could not be captured by the survey questions. Respondents could write other factors they considered when they were applying and/or ranking programs. Participants from URGs could also write in other factors that would make them feel more comfortable sharing their identities during the application process. In addition, there were questions that asked about the genetic counseling

training program admissions process as well as genetic counseling training programs' DEI initiatives. Answering these questions was not required to complete the survey.

2.3.6.1 Factors Considered When Applying and Ranking Programs

When thinking about programs to apply to, several participants noted the importance of DEI. For example, multiple participants noted the diversity of faculty/clinical supervisors as a factor they considered. Some participants took into account how they discussed DEI and answered DEI questions prior to interviews. A participant stated that they considered the following: “Did [faculty] shy away from these questions or were they happy to share?”. Another participant said that “it was important to [them] whether program staff brought up DEI issues (before being asked about them by prospective students) during events like open houses”. Multiple participants also looked towards students' experiences, including students' experiences with DEI. For example, a few participants stated that they wanted to see current students “speaking to the presence and practical application of DEI in the program” and how students “felt their program engaged with DEI and if they felt supported”. Other participants considered the political landscape of a program's location, a program's cohort size, and a program's rotation options.

Regarding ranking programs, multiple participants again expressed the importance of DEI. One mentioned “if faculty was able/unable to answer my questions on how they would support me as an underrepresented student” as a question that was important to them. Another participant noted that they “did end up putting [a] school at the very bottom of [their] list because [they] felt that that [the school] was a bit stuck in their ways and didn't express that they cared about diversity in [genetic counseling], which is something [they felt] every program should be emphasizing right now”. Participants also mentioned their experiences during the interview as being an important factor when ranking programs. Several participants reflected on “how approachable were the

current students and faculty during [the] meet and greet sessions” and “how personable the program faculty were during the interviews”. Other participants mentioned considering the following factors: having available support systems as part of and outside of the program, a program’s thesis requirements, transportation requirements for the program, and rotation opportunities.

2.3.6.2 Thoughts on the Admissions Process

Participants were asked to share their thoughts on what the admissions process did not capture about themselves as applicants. One common theme in the responses was regarding participants’ identities and groups in which they identify not being captured in the admissions process. Participants listed socioeconomic status, religion, and being a first-generation student as identities that were not elicited during the admissions cycle. In addition to certain identities, several participants said they felt that the experiences behind those identities were not properly appreciated. One participant said, “I think it’s hard to capture socioeconomic status in application materials. I am a first-generation student and grew up in a household with a lot of economic hardship and trauma. And that significantly impacted who I am as a person, but it is hard to talk about in essays and interviews”. As a first-generation American, another applicant said that the “difficulties of accessing opportunities needed to be considered a competitive applicant” was an aspect that was missed by the admissions process.

Another common theme was about sharing identities during the admissions cycle. Some participants expressed feeling uncomfortable talking about their identities. For instance, a participant said they were not sure about sharing information about their identity “because [they were not] sure how that might influence [their] chances”. Another participant stated, “I believe many [programs] emphasized visible minorities, which created a space where I did not feel I should

disclose that I am part of an invisible minority group”. Other participants felt that they were negatively perceived after sharing their identities. One participant said, “Some of my neurodivergent characteristics were not seen as such and negatively impacted programs’ view[s] about me”. A respondent who identified as a cisgender man expressed the following: “I feel like it is hard for me to form a connection with most genetic counselors – a lot of my own experiences are not easily as understood”. Multiple participants felt that certain identities were more valued than others, with some respondents feeling pressure to disclose those identities. For example, one respondent said, “I feel that my LGBT identity was much better addressed and understood than my low SES and first gen experiences”. Another participant stated, “At some point before I applied, I was told by a program director to emphasize the fact that I am gay in my applications in a way that felt sort of weird. More like I would be checking a diversity box than that the program would value my perspective and experiences. May have been an off moment of communication on the PD's part/projecting on mine, but it didn't feel great.”

Many survey respondents voiced that the application process did not give them the opportunity to fully display their personality and skill sets. Participants said that it was “hard to truly show [their] passion” and that “programs that had short interviews may not have provided enough time to show [their] personality”. A participant specifically said that the process was unable to capture their “openness to receive feedback” as well as their “devotion to extend an empathetic, caring, and supportive presence, not only to (potential/future) patients, but also classmates and colleagues”.

2.3.6.3 Genetic Counseling Training Programs’ DEI Initiatives

Survey respondents were asked what they believed was missing from genetic counseling training programs’ DEI initiatives. A frequent response was regarding programs having a detailed

action plan with their DEI initiatives. Several participants stated that “many programs highlight DEI initiatives but do not discuss or provide actionable outcomes” and that the “DEI information publicly available was more generic”. One respondent made a comment about programs’ DEI initiatives: “There are not goals that are measurable and they do not have timelines. If they had initiatives with an intended date of completion, it would be easier to see the actionable steps the program is taking”. Another theme in the responses was having URG involvement in developing and leading DEI initiatives. Hiring faculty who come from underrepresented backgrounds as well as having lectures given by individuals from URGs were noted by several individuals. One participant said, “From the programs I applied to, I think community-led lectures are missing. Often lectures are taught by individuals within the program, speaking about a certain minoritized community. It would be more meaningful to hear directly from that community”.

An additional suggestion was more incorporation of DEI in programs’ curriculum such as training in anti-ableism, LGBTQIA+-tailored healthcare, and cultural competency. Other examples included students getting involved in advocacy and community outreach opportunities. A couple of respondents also noted that DEI initiatives should include more overall outreach to prospective students of underrepresented backgrounds as well as “pipeline programs that extend beyond undergraduate students”. In addition, there were responses regarding the cost of the admissions process and training. One response stated, “To me, it felt like some programs used their DEI statements to state their values but didn’t back them up. For example, recognizing the financial hardships that applications and interviews can pose is one thing, yet many programs still have very high application fees with little opportunity for waivers and reductions and require multiple-day interviews”. Several respondents noted that programs could include more scholarships and

financial aid information in their DEI initiatives as there appeared to be a “lack of effort [from programs] to remove barriers in applying”.

2.4 Discussion

To our current knowledge, this is the first study that has examined how applicants incorporated a genetic counseling program’s DEI initiatives in addition to other factors when making their application and match decisions. Overall, a genetic counseling program’s DEI initiatives were important to all applicants as they were making their application and match decisions. When making these decisions, 75.5% (n = 74) of all applicants agreed or strongly agreed that a program’s DEI curriculum initiatives were important to them. 68.4% (n = 67) of all applicants agreed or strongly agreed that a program’s DEI recruitment initiatives were important to them.

When comparing how respondents from URGs and non-URGs considered a program’s DEI recruitment initiatives in their decisions, a two-sample t-test with equal variances did find a statistically significant difference between both groups ($p < 0.0001$). For a program’s DEI recruitment initiatives, 83.3% (n = 50) of participants from URGs agreed or strongly agreed about this factor’s importance while 6.7% (n = 4) disagreed or strongly disagreed. In contrast, 44.7% (n = 17) of non-URGs agreed or strongly agreed about this factor’s importance while 31.6% (n = 12) disagreed or strongly disagreed. In addition to a program’s DEI recruitment initiatives, a program’s tuition was also important to participants from URGs. Out of a list of six factors that included a program’s DEI initiatives, a program’s tuition was the factor with the highest percentage of URGs (95%, n = 57) agreeing or strongly agreeing about its importance when applying to and ranking

programs. For individuals from underrepresented racial and ethnic groups, previous studies have identified cost of genetic counseling training programs as a barrier to entering the field and a major consideration when choosing programs to apply to (Alvarado-Wing et al., 2021; Mittman & Downs, 2008; Schoonveld et al., 2007). While the participants from URGs in this study included other underrepresented groups in addition to racial and ethnic minorities, the cost of graduate school training is likely also a barrier to URGs such as those of low socioeconomic status and first-generation college students. Several participants from this study noted that financial aid is missing from programs' DEI initiatives. Prior studies have raised the suggestion of providing scholarships to increase recruitment of URGs into genetic counseling (Alvarado-Wing et al., 2021; Schoonveld et al., 2007). The findings from this study underscore the importance of a program's DEI recruitment initiatives as tuition and financial aid appear to significantly impact applicants from URGs' decisions during the admissions process.

The diversity in a program's previous student cohorts was also an important factor in participants from URGs' decision-making when applying and ranking programs. For this factor, a two-sample t-test with equal variances found a statistically significant difference between participants from URGs and non-URGs ($p = 0.0473$). For participants from URGs, 23.3% ($n = 14$) strongly agreed, 35% ($n = 21$) agreed, and 28.3% ($n = 17$) were neutral about the importance of the diversity in a program's previous student cohorts. For participants from non-URGs, 7.9% ($n = 3$) strongly agreed, 36.8% ($n = 14$) agreed, and 34.2% ($n = 13$) were neutral about the diversity in a program's previous student cohort being important to them. In addition, when participants from URGs were asked to select factors that would make them feel more comfortable in sharing their identity, diversity in past cohorts was the factor with the second highest percentage of responses (73.2%, $n = 41$). These findings could be explained by a previous study that found that a lack of

diversity in student cohorts caused underrepresented individuals to be uncertain about how they would fit in with the program (Alvarado-Wing et al., 2021). Underrepresented individuals have expressed feelings of isolation when they are in the minority of their programs. Having classmates who also belong to URGs appears to be beneficial as students from URGs are more comfortable expressing themselves and are grateful to have classmates they can relate to (Schoonveld et al., 2007). As a result, participants from URGs may be placing more emphasis on the diversity of a program's previous student cohorts to get a sense of how a program values diversity and if they feel that they could belong in that program.

In addition to the diversity in a program's student cohorts, the importance of diversity in program staff and leadership was a frequent theme identified in this study. When participants from URGs were asked about factors that would make them feel more comfortable in sharing their identity, the factor with the highest percentage of responses was diversity in program staff and leadership (87.5%, n = 49). Several participants also wrote that they considered the diversity in a program's faculty when applying to programs. Also, multiple participants wrote that program's DEI initiatives could use more involvement from individuals from URGs. This could involve more faculty from URGs as well as speakers from URGs who present material on providing care for URGs. Participants from a previous study examining the perspectives of racial and ethnic minorities on their journeys to become genetic counselors also suggested more involvement from URGs in diversity trainings (Alvarado-Wing et al., 2021). Also, as mentioned previously, feelings of loneliness have been expressed by underrepresented individuals when they are in the minority of their programs; underrepresented individuals feel more comfortable expressing who they are when they have classmates and colleagues with similar backgrounds (Schoonveld et al., 2007). Previous research has noted that having genetic counseling mentors, especially those with a similar

identity, can leave a positive impact on students (Alvarado-Wing et al., 2021). As a result, participants from URGs in this study may have placed importance on seeking mentors with similar underrepresented backgrounds so they could learn from someone who they could relate to and has gone through similar experiences. These findings also suggest the importance of increasing the presence of faculty from URGs in allowing applicants from URGs to feel an increased sense of belonging in the field.

One finding this study noted was that most participants from URGs (82.1%, $n = 46$) felt comfortable sharing information about their identities if they were asked during the admissions process. In addition, 64.3% ($n = 36$) of participants from URGs felt that questions they were asked about identity were fully able to capture the groups in which they identified. While these findings are encouraging, there can still be areas for improvement. For example, 60.7% ($n = 34$) of participants from URGs indicated that demographic questions with inclusive answer choices would make them feel more comfortable in sharing their identity. Also, participants expressed instances in which they felt uncomfortable sharing their identity or felt that their identity was not fully understood. One participant expressed in open-text responses that they felt programs emphasized visible minorities which stopped them from disclosing that they were part of an invisible minority group. Another participant stated that the experience of being a first-generation student and of low socioeconomic status was hard to capture in application materials. A finding from this study could indicate a place in the admissions process that could be used to bring more attention to some of these identities. This study found a statistically significant difference between participants from URGs and non-URGs in the importance of a program's application questions about DEI when deciding to apply to that program ($p = 0.0362$); 41.4% ($n = 24$) of URGs agreed or strongly agreed about this factor's importance compared to 22.2% ($n = 8$) of non-URGs. As this

finding suggests that participants from URGs value the importance of a program's application questions about DEI, genetic counseling training programs could include more inclusive answer choices and provide more space for individuals from URGs to share about their less visible identities.

In terms of learning about a program's DEI initiatives, this study found that 47.9% (n = 45) of all participants were easily or very easily able to find information on a program's DEI initiatives on their website while 20.2% (n = 19) found this difficult. 77.4% (n = 65) of all respondents reported that it was likely or very likely that a program shared information about their DEI initiatives during the interview day. While many participants were able to learn about a program's DEI initiatives at some point during the admissions process, there can be areas for improvement. One study found that students chose not to apply to certain programs due to the difficulty of navigating the program's website and finding the information they were looking for (Ivan et al., 2017). Therefore, if potential applicants are interested in learning about a program's DEI initiatives and are having a hard time finding that information on their website, then these applicants may be discouraged from applying to that program. One participant in the study noted that they would like to see programs advertise their DEI action plans as the DEI information publicly available was more generic. When asked about what was missing from genetic counseling program's DEI initiatives, multiple participants stated action plans with measurable outcomes and timelines. These findings suggest that there should be increased efforts made by genetic counseling training programs to make their DEI initiatives more detailed and easily accessible to the public.

Across most of the factors examined, this study did not identify statistically significant differences between matched URGs and unmatched URGs. It is possible that matched URGs and unmatched URGs place the same amount of importance on factors such as DEI initiatives, tuition,

and location when making application and ranking decisions. However, the interpretation of the results is limited by a small sample size. The number of unmatched URGs in the sample was only 8 so it is possible that any differences between matched URGs and unmatched URGs may not have been detected. While there were no differences between these two groups of participants for most of the factors analyzed, a two-sample t-test did find that there was a statistically significant difference between matched URGs and unmatched URGs in feeling that their identity hindered them in the admissions process ($p = 0.0021$). 17.8% ($n = 8$) of matched URGs agreed or strongly agreed that their identity hindered them in the admissions process compared to 62.5% ($n = 5$) of unmatched URGs. Underrepresented individuals have been noted in a prior study to feel anxious about their belonging in the field and have expressed instances of false assumptions being made about them based on their background (Schoonveld et al., 2007). These could be potential explanations as to why these unmatched URGs felt that their identity hurt them during the admissions process. Future research with larger sample sizes to further look into the perspectives of unmatched URGs.

This study's demographics were fairly representative of the demographic makeup of genetic counseling applicants as reported by the National Matching Services (NMS). Over the 2020 to 2022 admissions cycles, the ranges of percentages of racial/ethnic groups for registered match applicants were the following: 63 to 72% White, 5 to 9%, Hispanic/Latinx, 7 to 8% East/Southeast Asian, 5 to 6% South Asian, 2 to 6% Black/African American, 2% Middle Eastern/North African, and 1% American Indian/Alaska Native. In regards to the gender identity of registered match applicants over the 2020 to 2022 admissions cycles, the percentage of female applicants ranged from 86 to 87%, the percentage of male applicants ranged from 10 to 12%, and the percentage of nonbinary applicants was 1% (National Matching Services, 2022). For this study,

most of the participants were White (69.4%) and identified as a cisgender woman (93.9%). When compared to the NMS statistics, there were certain racial/ethnic groups in our study with higher representation such as Latinx/Hispanic (13.3%), East Asian/Southeast Asian (13.3%), South Asian (7.1%), and African American/Black (7.1%). The study population could have possibly been more diverse than the applicant population reported by NMS due to selection bias that affected who decided to complete the survey. While the study population may have had slightly higher percentages of underrepresented groups compared to the applicant population reported by NMS, the study population is still representative of the lack of diversity in the genetic counseling field (Mittman & Downs, 2008; NSGC, 2022a).

2.4.1 Study Limitations and Future Directions

There were a number of limitations of this study. One limitation was the small sample size of 98 individuals. According to the Genetic Counseling Admissions Match Statistics, 1652, 2069, and 2067 individuals applied to the match in the years 2020 to 2022 respectively (National Matching Services, 2022). Even when considering that a given number of the individuals in each year could have been reapplicants, the study sample size is still low considering the total number of applicants across the three admissions cycles. In addition, not all 98 individuals completed the survey which resulted in varying numbers of responses for questions. The questions towards the beginning of the survey had a greater number of responses, so it is possible that participants were experiencing survey fatigue as they went through the survey. As a result, the sample sizes were even smaller for some of the questions and comparisons being analyzed. A larger sample size would have allowed for a more representative sample and more generalizable results. In addition, statistical analyses that have more statistical power could have been used. This is especially

relevant for the comparisons made between matched URGs and unmatched URGs as the number of unmatched URGs was only 8.

In addition, selection bias may have impacted the results. Individuals who chose to participate and complete the survey may have had a greater interest in DEI topics than the average genetic counseling training program applicant. This could be a possible explanation as to why the survey was taken by 61% of respondents who self-identified as a URG. Additionally, this could have limited the detection of any statistically significant differences when comparing participants from URGs and non-URGs. Another limitation of this study could be the interpretation of the questions asked in the survey. While the survey questions were designed to avoid ambiguity, it is possible that respondents could have had different interpretations of the questions. For example, when asked about the importance of a program's location in their application decisions, participants could have interpreted location as the political landscape of the location, the proximity of the location to their home state, or the cost of living at the location. This could be a reason as to why location was one of the factors that participants agreed or strongly agreed on as participants could have been considering all these aspects about a program's location.

Future research could involve studies with larger sample sizes of past applicants from URGs, especially those who did not match to a program. This research could build on this study to further characterize their experiences, possible barriers, and consideration of DEI initiatives during the admissions process. In addition, these studies could focus on individual URGs to identify experiences that are unique to that group. This study brought attention to identities that were less likely to be captured during the admissions process (i.e. first generation student, low socioeconomic status) so these are examples of URGs that could be further studied.

Findings from this study could also inform programs' DEI initiatives and other changes in the future. For example, programs could outline their DEI initiatives and provide detailed actionable outcomes on their websites so that this information could become easily accessible for prospective students. In addition, more programs could incorporate inclusive answer choices in their demographics questions. This could allow applicants to feel more comfortable sharing their identities should they choose. As this study showed that participants from URGs strongly consider a program's DEI recruitment initiatives into their application and ranking decisions, programs could continue to increase their efforts in creating scholarships to help recruit more individuals from URGs into the field.

2.5 Conclusions

This study assessed how past applicants considered genetic counseling training programs' DEI initiatives as well as other factors during the admissions process. To examine any differences in their decision-making and thought processes, the study also compared URGs to non-URGs as well as matched URGs and unmatched URGs. To our knowledge, prior studies have not examined how past applicants have incorporated a program's DEI initiatives into their application decisions. Findings from this study suggest that respondents from URGs place a stronger importance on a program's DEI recruitment initiatives and diversity in previous student cohorts compared to respondents from non-URGs when making application and/or ranking decisions. In addition to diversity in a program's student cohorts, participants from URGs seemed to value diversity in program staff as participants expressed that these two factors would make them feel more comfortable in sharing their identity. Several participants expressed that the application process

was not able to appreciate the experiences behind less visible identities such as a low socioeconomic status background and a first-generation student. Programs could modify their applications through more inclusive question and answer choices as well as prompts that may be able to better capture these experiences. In addition, programs could increase their focus on their DEI recruitment initiatives to help alleviate the cost barriers that individuals from URGs face when trying to enter the profession. This study could help inform changes that could serve as a positive feedback loop to recruit and retain more individuals from URGs into genetic counseling.

3.0 Research Significance to Genetic Counseling and Public Health

As mentioned previously, there has historically been a lack of diversity in the genetic counseling field. NSGC has taken steps over the years to address this issue. In 2022, NSGC created an action plan consisting of DEI initiatives that involve communication, education and training, NSGC's annual conference, policy changes, partnerships and outreach. Some of these initiatives include quarterly updates on the progress of the action plan, increasing awareness of genetic counseling through early outreach and community service programs to underrepresented groups and partnering with organizations that support underrepresented students and genetic counselors to create resources (NSGC, 2022b). Many of NSGC's plans echo suggestions and thoughts provided by the participants of this study. When asked what was missing from genetic counseling training program's DEI initiatives, a common response was a lack of detailed actionable outcomes. Genetic counseling training programs could post action plans of DEI initiatives and provide regular updates on their progress online so that this information is publicly available to prospective students. By providing this level of assurance and transparency to increasing diversity, programs could potentially attract from individuals from URGs who value the program's commitment to diversity.

This project also has significance to the field of public health through addressing several essential public health services. The Centers for Disease Control and Prevention (CDC) has established a framework consisting of ten essential public health services to protect and promote health equity. Two of the ten essential public health services this project focuses on is building a diverse and skilled workforce as well as enabling equitable access (Centers for Disease Control and Prevention, 2020). Compared to other healthcare professions such as physicians and social

workers, genetic counseling is the least racially and ethnically diverse (Sarmiento, 2019). This thesis project identified potential barriers for the recruitment of underrepresented groups into genetic counseling as well as possible ways that programs could improve their DEI initiatives and aspects of their admissions processes. If these barriers and improvements are addressed, then this could allow for higher recruitment and retainment of URGs into the genetic counseling field. A more diverse workforce may lead to improvements in access and quality of healthcare to underserved communities. For example, when physicians and patients share the same race, appointments tended to be longer with higher patient satisfaction (Cooper et al., 2003). This is important as many underrepresented groups have experienced a history of poor quality of care, difficulty seeking access to care, and discrimination (Sorkin et al., 2010; Casey et al., 2019; Lagu et al., 2022). In addition to impacting public health, addressing the barriers that are affecting the recruitment of URGs into the field would allow the profession to accomplish its goals to increase diversity in the field.

Another essential public health service that this project addresses is strengthening, supporting, and mobilizing communities and partnerships (Centers for Disease Control and Prevention, 2020). When participants were asked to give their opinions on what is missing from program's DEI initiatives, multiple participants stated community outreach. The genetic counseling field could invest more resources into working with communities with URGs to develop pipeline programs that bring early awareness of genetic counseling to and recruit individuals from URGs. As an assignment that could be incorporated into their curriculum, genetic counseling training programs could also have their students visit local schools in communities of URGs to provide presentations and teach K-12 students about genetics and genetic counseling. In addition, more programs could have lectures about certain underrepresented groups in their

curriculum that are given by individuals belonging to those underrepresented groups. DEI initiatives that involve building strong partnerships with underrepresented communities will be vital in increasing recruitment of individuals from these communities.

Appendix A IRB Approval



EXEMPT DETERMINATION

Date:	December 20, 2022
IRB:	STUDY22100169
PI:	Christine Munro
Title:	The Perspectives of Applicants on the Diversity, Equity and Inclusion Initiatives and Admissions Processes of Genetic Counseling Training Programs
Funding:	None

The Institutional Review Board reviewed and determined the above referenced study meets the regulatory requirements for exempt research under 45 CFR 46.104(d).

Determination Documentation

Determination Date:	12/20/2022
Exempt Category:	(2)(i) Tests, surveys, interviews, or observation (non-identifiable)
Determinations:	None
Approved Documents:	<ul style="list-style-type: none">• Shetty_Final Survey Questions.docx, Category: Data Collection;• HRP-721 - WORKSHEET - Exemption_Tests Surveys Public Behavior_Version_0.01.docx, Category: IRB Protocol;• Shetty_Survey Introduction Consent Form3.docx, Category: Recruitment Materials;• Thesis Research Study Recruitment Scripts.docx, Category: Recruitment Materials;

If you have any questions, please contact the University of Pittsburgh IRB Coordinator, [Dana DiVirgilio](#). **NOTE:** Modifications are only required if they will affect the exempt determination. It is important to **close your study when finished** by submitting a Continuing Review.

Please take a moment to complete our [Satisfaction Survey](#) as we appreciate your feedback.

Appendix B Survey

Dear Past Applicant,

One of the challenges that genetic counseling faces as a profession is the lack of diversity in the field. Historically, the genetic counseling workforce has been composed of predominantly non-Hispanic white genetic counselors. In recent years, the field has focused on taking steps to promote diversity in the field. For example, many genetic counseling training programs have developed their own diversity, equity, and inclusion (DEI) initiatives. However, there has been little research on how these efforts have impacted prospective genetic counseling students. For these reasons, I invite you to complete an online survey aiming to address these gaps in the literature.

The data collected from this survey will be used for my master's thesis project that I am carrying out as part of my training. Through this survey, this research study will investigate the factors applicants consider during their application and match decisions, with a focus on genetic counseling programs' DEI initiatives. The survey will also include questions on the experiences, perceived strengths, and perceived barriers of the genetic counseling program admissions process for applicants from underrepresented groups (URG). These questions have been designed to be broad enough to collect information that is not identifiable. We will not collect any clear identifiers like your name or address.

To be eligible for this study, individuals must have applied to a genetic counseling program in the United States and/or Canada between the years of 2020 and 2022. Current University of Pittsburgh students are not eligible to participate in this study. Participation in this survey is voluntary. The survey will take about 10 to 15 minutes. There are no benefits or risks to you for participating in this survey. Whether or not you choose to partake in this survey will not affect your relationship with the University of Pittsburgh Genetic Counseling Program. As this survey does not collect identifiable information, participation in this study will not affect your future application to a genetic counseling training program.

You may stop your participation at any time by closing the window to the survey. The responses to the survey will be anonymous. Although every reasonable effort has been taken, confidentiality during Internet communication activities cannot be guaranteed and it is possible that additional information beyond that collected for research purposes may be captured and used by others not associated with this study.

If you would like to participate, please click the arrow in the bottom right corner of the page.

Thank you for your time. If you have any questions or concerns regarding this project, please email me at ius3@pitt.edu.

Sincerely,
Impana Shetty
Second-Year Genetic Counseling Student
University of Pittsburgh Genetic Counseling Program

Q1

▼  Skip to

End of Survey if No Is Selected

Have you applied to a genetic counseling program in the United States and/or Canada between the years of 2020 and 2022?

- Yes
- No

Q2

▼  Skip to

End of Survey if Yes Is Selected

Are you a current University of Pittsburgh student?

- Yes
- No

Please use the following information to answer this question. In the field of genetic counseling, an individual belonging to an underrepresented group (URG) is an individual who is not a white, able-bodied, heterosexual female. Individuals may fall into an URG based on diversity domains such as race/ethnicity, LGBTQIA+ status, socioeconomic status, generation of immigration (i.e. first generation student). *[Please note that this is not an all-inclusive list].*

Q3

Based on this definition, do you self-identify in an URG group in the field of genetic counseling?

- Yes
 - No
-
-

----- Page Break -----

Q4

How do you identify in terms of race/ethnicity? Please select all that apply:

- African American/Black
- Latinx/Hispanic
- East Asian/Southeast Asian
- South Asian
- Native American/Alaska Native
- Native Hawaiian/Pacific Islander
- Middle Eastern/North African/West Asian
- White
- Other - please describe:
- Prefer not to say

Q5

Do you identify as a member of the following groups? Please select all that apply:

- LGBTQIA+ community
 - International Student
 - Disability community
 - Neurodivergent
 - Low socioeconomic status
 - First-generation student
 - Other - please describe:
 - Prefer not to say
 - None of the above
-
-

Q6

What is your current age?

- Under 20 years old
- 20 to 24 years old
- 25 to 29 years old
- 30 to 34 years old
- 35 to 39 years old
- 40+ years old
- Prefer not to answer

Q7

Which of the following best describes your gender identity?

- Cisgender Man
- Cisgender Woman
- Transgender Man
- Transgender Woman
- Non-binary
- Prefer to self-describe:
- Prefer not to say

The following question is related to how applicants choose which genetic counseling training programs to apply to and/or rank. Diversity, equity, and inclusion (DEI) initiatives are policies, programs, and statements that promote the representation and participation of individuals from underrepresented groups. DEI initiatives for a genetic counseling training program can be separated into two categories: the program's curriculum and recruitment (i.e. through scholarships, financial aid).

Q8

To what extent do you agree or disagree with the following statements when choosing which schools to apply to and/or rank?

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
A program's DEI curriculum initiatives were important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A program's DEI recruitment initiatives (i.e. scholarships, financial aid) were important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A program's tuition was important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A program's location was important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The patient population at a program's rotation sites was important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The diversity in a program's previous student cohorts was important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

The following questions are related to how applicants choose which genetic counseling training programs to apply to. Diversity, equity, and inclusion (DEI) initiatives are policies, programs, and statements that promote the representation and participation of individuals from underrepresented groups. DEI initiatives for a genetic counseling training program can be separated into two categories: the program's curriculum and recruitment (i.e. through scholarships, financial aid).

Q9

How easily were you able to find information on a program's DEI initiatives on their website?

- Very Easily
 - Easily
 - Neutral
 - Difficult
 - Very Difficult
-

Q10

A program's application questions about DEI were important in deciding to apply to that program.

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree

Q11

If there were any factors taken into consideration that were not previously listed, please list them below.

Q12

▼  Skip to

End of Block if No Is Selected

Did you have the opportunity to rank genetic counseling programs in the NMS Match System?

- Yes
- No

----- Page Break -----

The following questions are related to deciding how to rank genetic counseling training programs. Ranking genetic counseling programs is defined as ordering genetic counseling programs based on personal preference in the NMS Match system.

Q13

Did you choose not to rank a program based on their DEI initiatives?

- Yes
- No

Q14

How likely was it that a program shared information about their DEI initiatives during the interview day?

- Very Likely
- Likely
- Neutral
- Unlikely
- Very Unlikely

Q15

Being able to rank scholarship tracks for a program was important in deciding to rank that program.

- Strongly Agree
 - Agree
 - Neither Agree Nor Disagree
 - Disagree
 - Strongly Disagree
-
-

Q16

I was less likely to favorably rank a program if I had to apply for a scholarship after matching.

- Strongly Agree
 - Agree
 - Neither Agree Nor Disagree
 - Disagree
 - Strongly Disagree
-
-

Q17

Current students' experiences in the training program were important in deciding to rank that program.

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree


Q18

Feeling comfortable talking to program staff was important in deciding to rank that program.

- Strongly Agree
 - Agree
 - Neither Agree Nor Disagree
 - Disagree
 - Strongly Disagree
-
-

Q19


If there were any factors taken into consideration when ranking a program that were not previously stated, please list them below.

▼  Display this question

If Based on this definition, do you self-identify in an URG group in the field of genetic counseling? Yes Is Selected

The following questions are related to experiences during the admissions process.

Q20


▼  Display this question

If Based on this definition, do you self-identify in an URG group in the field of genetic counseling? Yes Is Selected

If a program asked you about how you identify at some point during the admissions process, were you comfortable with sharing that information?

- Yes
- No

Q21


▼  Display this question

If Based on this definition, do you self-identify in an URG group in the field of genetic counseling? Yes Is Selected

If asked about your identity, do you feel that the questions were able to fully capture the groups in which you identify?

- Yes
- No

Q22


▼  Display this question

If Based on this definition, do you self-identify in an URG group in the field of genetic counseling? Yes Is Selected

If you knew a program was asking about identity to improve DEI efforts, would that make you more comfortable in sharing your identity?

- Yes
- No
- Unsure

Q23


▼  Display this question

If Based on this definition, do you self-identify in an URG group in the field of genetic counseling? Yes Is Selected

What factors would make you more comfortable sharing your identity? Select all that apply.

- A program's DEI initiatives
- Diversity in past cohorts
- Diversity in program staff and leadership
- Demographic questions with inclusive answer choices
- Other

Q24

▼  Display this question

If Based on this definition, do you self-identify in an URG group in the field of genetic counseling? Yes Is Selected

I felt that my identity hindered me in the admissions process.

- Strongly Agree
- Agree
- Neither Agree Nor Disagree
- Disagree
- Strongly Disagree

Please answer the following questions.

Q25

What do you think the admissions process did not capture about you as an applicant?
Please share your thoughts below if applicable.

Q26

What do you believe is missing from genetic counseling training programs' DEI initiatives?

Please answer the next set of questions based on your most recent application cycle.

Q27

How many genetic counseling training programs did you apply to?

- 1-2
 - 3-4
 - 5-6
 - 7-8
 - 9-10
 - 11-12
 - 13+
-

Q28

How many programs did you receive an interview invitation from?

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 10+

Q29

What was your undergraduate GPA on a 4.0 scale?

- Below 2.00
- 2.00-2.25
- 2.26-2.50
- 2.51-2.75
- 2.76-3.00
- 3.01-3.25
- 3.26-3.50
- 3.51-3.75
- 3.76-4.00

Q30

▼  Skip to

Did you match to a genetic counseling... if No Is Selected

Were you a reapplicant?


- Yes
- No

Q31

If you were a reapplicant, how many times had you applied to a genetic counseling program previously?

- 1
- 2
- 3+

Q32

 Skip destination

Did you match to a genetic counseling training program?

Yes

No

End of Survey

We thank you for your time spent taking this survey.

Your response has been recorded.

Appendix C Supplemental Figures

Appendix Table 1 Participants from URGs Demographics

Participants from URGs

Demographic	Value	Count (n)	Percentage
Age	Under 20 years old	0	0.0%
	20 to 24 years old	28	46.7%
	25 to 29 years old	25	41.7%
	30 to 34 years old	3	5.0%
	35 to 39 years old	2	3.3%
	40+ years old	1	1.7%
	Prefer not to answer	1	1.7%
Gender Identity	Cisgender Man	3	5.0%
	Cisgender Woman	54	90.0%
	Transgender Man	0	0.0%
	Transgender Woman	0	0.0%
	Non-binary	3	5.0%
	Prefer to self-describe	0	0.0%
	Prefer not to say	0	0.0%

Appendix Table 2 Participants from Non-URGs Demographics

Participants from Non-URGs

Demographic	Value	Count (n)	Percentage
Race/Ethnicity	African American/Black	7	11.7%
	Latinx/Hispanic	13	21.7%
	East Asian/Southeast Asian	12	20.0%
	South Asian	6	10.0%
	Native American/Alaska Native	1	1.7%
	Native Hawaiian/Pacific Islander	0	0.0%
	Middle Eastern/North African/West African	2	3.3%
	White	32	53.3%
	Other-please describe	1	1.7%
	Prefer not to say	0	0.0%
Age	Under 20 years old	0	0.0%
	20 to 24 years old	22	57.9%
	25 to 29 years old	11	28.9%
	30 to 34 years old	4	10.5%

	35 to 39 years old	1	2.6%
	40+ years old	0	0.0%
	Prefer not to answer	0	0.0%
Gender Identity	Cisgender Man	0	0.0%
	Cisgender Woman	38	100.0%
	Transgender Man	0	0.0%
	Transgender Woman	0	0.0%
	Non-binary	0	0.0%
	Prefer to self-describe	0	0.0%
	Prefer not to say	0	0.0%

Appendix Table 3 All Participants Application Metrics

All Participants

Demographic	Response	Count (n)	Percentage
Number of Genetic Counseling Programs Applied To	1-2	5	5.9%
	3-4	11	12.9%
	5-6	15	17.6%
	7-8	26	30.6%
	9-10	14	16.5%
	11-12	10	11.8%
	13+	4	4.7%
Number of Interview Invitations Received	0	4	4.7%
	1-2	26	30.6%
	3-4	20	23.5%
	5-6	16	18.8%
	7-8	12	14.1%
	9-10	5	5.9%
	10+	2	2.4%
Undergraduate GPA	Below 2.00	0	0.0%
	2.00-2.25	0	0.0%
	2.26-2.50	2	2.4%
	2.51-2.75	0	0.0%
	2.76-3.00	3	3.5%
	3.01-3.25	12	14.1%
	3.26-3.50	16	18.8%
	3.51-3.75	18	21.2%
	3.76-4.00	34	40.0%
Reapplicant Status	Yes	36	42.4%
	No	49	57.6%
Match Status	Yes	67	79.8%

	No	17	20.2%
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Appendix Table 4 URGs vs Non-URGs Ranking Considerations

<i>Question: Current students' experiences in the training program were important in deciding to rank that program.</i>				
	URG		Non-URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	29	56.9%	23	69.7%
Agree	20	39.2%	8	24.2%
Neither Agree Nor Disagree	2	3.9%	2	6.1%
Disagree	0	0.0%	0	0.0%
Strongly Disagree	0	0.0%	0	0.0%
	51		33	
<i>Question: Feeling comfortable talking to program staff was important in deciding to rank that program.</i>				
	URG		Non-URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	33	64.7%	25	75.8%
Agree	16	31.4%	8	24.2%
Neither Agree Nor Disagree	1	2.0%	0	0.0%
Disagree	1	2.0%	0	0.0%
Strongly Disagree	0	0.0%	0	0.0%
	51		33	
<i>Question: Being able to rank scholarship tracks for a program was important in deciding to rank that program.</i>				
	URG		Non-URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	16	31.4%	8	24.2%
Agree	16	31.4%	9	27.3%
Neither Agree Nor Disagree	10	19.6%	9	27.3%
Disagree	8	15.7%	6	18.2%
Strongly Disagree	1	2.0%	1	3.0%
	51		33	
<i>Question: I was less likely to favorably rank a program if I had to apply for a scholarship after matching.</i>				
	URG		Non-URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	5	9.8%	2	6.1%

Agree	10	19.6%	2	6.1%
Neither Agree Nor Disagree	16	31.4%	14	42.4%
Disagree	18	35.3%	12	36.4%
Strongly Disagree	2	3.9%	3	9.1%
	51		33	

Appendix Table 5 URGs vs Non-URGs Application Metrics

<i>Number of Genetic Counseling Programs Applied To</i>				
	URG		Non-URG	
Values	Counts	Percentage	Counts	Percentage
1-2	5	9.3%	0	0.0%
3-4	7	13.0%	4	12.9%
5-6	9	16.7%	6	19.4%
7-8	15	27.8%	11	35.5%
9-10	9	16.7%	5	16.1%
11-12	6	11.1%	4	12.9%
13+	3	5.6%	1	3.2%
	54		31	
<i>Number of Interview Invitations Received</i>				
	URG		Non-URG	
Values	Counts	Percentage	Counts	Percentage
0	3	5.6%	1	3.2%
1-2	14	25.9%	12	38.7%
3-4	13	24.1%	7	22.6%
5-6	9	16.7%	7	22.6%
7-8	11	20.4%	1	3.2%
9-10	3	5.6%	2	6.5%
10+	1	1.9%	1	3.2%
	54		31	
<i>Undergraduate GPA</i>				
	URG		Non-URG	
Ranges	Counts	Percentage	Counts	Percentage
Below 2.00	0	0.0%	0	0.0%
2.00-2.25	0	0.0%	0	0.0%
2.26-2.50	1	1.9%	1	3.2%
2.51-2.75	0	0.0%	0	0.0%
2.76-3.00	3	5.6%	0	0.0%
3.01-3.25	6	11.1%	6	19.4%
3.26-3.50	9	16.7%	7	22.6%

3.51-3.75	10	18.5%	8	25.8%
3.76-4.00	25	46.3%	9	29.0%
	54		31	
Question: Did you match to a genetic counseling program?				
	URG		Non-URG	
Response	Counts	Percentage	Counts	Percentage
Yes	45	84.9%	22	71.0%
No	8	15.1%	9	29.0%
	53		31	

Appendix Table 6 Matched URGs vs Unmatched URGs Ranking Considerations

Question: Current students' experiences in the training program were important in deciding to rank that program.				
	Matched URG		Unmatched URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	27	60.0%	2	40.0%
Agree	16	35.6%	3	60.0%
Neither Agree Nor Disagree	2	4.4%	0	0.0%
Disagree	0	0.0%	0	0.0%
Strongly Disagree	0	0.0%	0	0.0%
	45		5	
Question: Feeling comfortable talking to program staff was important in deciding to rank that program.				
	Matched URG		Unmatched URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	31	68.9%	2	40.0%
Agree	12	26.7%	3	60.0%
Neither Agree Nor Disagree	1	2.2%	0	0.0%
Disagree	1	2.2%	0	0.0%
Strongly Disagree	0	0.0%	0	0.0%
	45		5	
Question: Being able to rank scholarship tracks for a program was important in deciding to rank that program.				
	Matched URG		Unmatched URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	14	31.1%	2	40.0%
Agree	15	33.3%	1	20.0%
Neither Agree Nor Disagree	8	17.8%	1	20.0%

Disagree	7	15.6%	1	20.0%
Strongly Disagree	1	2.2%	0	0.0%
	45		5	
<i>Question: I was less likely to favorably rank a program if I had to apply for a scholarship after matching.</i>				
	Matched URG		Unmatched URG	
Responses	Counts	Percentage	Counts	Percentage
Strongly Agree	4	8.9%	0	0.0%
Agree	9	20.0%	1	20.0%
Neither Agree Nor Disagree	13	28.9%	3	60.0%
Disagree	17	37.8%	1	20.0%
Strongly Disagree	2	4.4%	0	0.0%
	45		5	

Appendix Table 7 Matched URGs vs Unmatched URGs Application Metrics

<i>Number of Genetic Counseling Programs Applied To</i>				
	Matched URG		Unmatched URG	
Values	Counts	Percentage	Counts	Percentage
1-2	4	8.9%	1	12.5%
3-4	4	8.9%	2	25.0%
5-6	8	17.8%	1	12.5%
7-8	13	28.9%	2	25.0%
9-10	7	15.6%	2	25.0%
11-12	6	13.3%	0	0.0%
13+	3	6.7%	0	0.0%
	45		8	
<i>Number of Interview Invitations Received</i>				
	Matched URG		Unmatched URG	
Values	Counts	Percentage	Counts	Percentage
0	0	0.0%	3	37.5%
1-2	9	20.0%	4	50%
3-4	12	26.7%	1	12.5%
5-6	9	20.0%	0	0%
7-8	11	24.4%	0	0%
9-10	3	6.7%	0	0%
10+	1	2.2%	0	0%
	45		8	
<i>Undergraduate GPA</i>				

Ranges	Matched URG		Unmatched URG	
	Counts	Percentage	Counts	Percentage
Below 2.00	0	0.0%	0	0%
2.00-2.25	0	0.0%	0	0%
2.26-2.50	0	0.0%	0	0%
2.51-2.75	0	0.0%	0	0%
2.76-3.00	3	6.7%	0	0%
3.01-3.25	4	8.9%	2	25%
3.26-3.50	7	15.6%	2	25%
3.51-3.75	8	17.8%	2	25%
3.76-4.00	23	51.1%	2	25%
	45		8	

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