Part A: Problem Landscape

As part of the higher education experience, college students learn to navigate maintaining social capital, academic success, and personal identity in a simultaneous fashion. However, balancing these responsibilities can often lead to an increase in stress, anxiety, and even depression. To combat this, higher education institutions offer mental health services to provide resources and counseling to students willing to seek them out. In real-world applications, the cost of healthcare can be a contributing factor in forgoing seeking out mental health services (Hunt et al., 2014). To mitigate barriers, higher education institutions offer universal healthcare coverage to reduce the burden of cost. Nonetheless, research suggests that students of color, specifically Black and Latinx demonstrate less engagement in these mental health services, which can stem from a lack of cultural relevance and resources that align with the student's identity. In examining these attributes, we raise the following question: How can identity-based, machine learning interventions close the gap between POC and their White counterparts in mental health resources seeking behaviors at large R1 public higher education institutions?

Part B: Literature Review

The identity-based motivation theory (IBM) attempts to explain how determinants influence an individuals' perception of a behavior and how in line it is with their identity (Oyserman & Destin, 2010). This in turn impacts the self-efficacy of the individual, which is relevant to the difficulty in attaining a goal. Successful intervention uptake is achieved when procedures put an emphasis on behaviors in context to identity, and the seeking individual recognizes this alignment. By utilizing this theory as a foundation for our proposed solution, we can understand how a user-centered design process is essential. With this design process, we can ensure that our population of unrepresented students is being served sufficiently. Paired with machine learning practices, our team aims to build a system that is dynamic and responsive to important features in relation to a student's identity.

When examining mental health seeking behaviors, common barriers such as cost, perceived stigmas, time for treatment, or lack of representation in the counseling staff have been reported by everyday individuals as to why they may avoid engaging in mental health services (Hunt et al., 2014; LeViness et al., 2018). Looking back at the research question formulation, the removal of cost barriers leaves us room to examine the remaining disparities that influence macro and micro levels (Bronfenbrenner, 1979).

Prior research that investigates these disparities informed our team how they affect our underrepresented student populations. Racial/ethnic minority college students reported experiencing

higher levels of imposter syndrome and struggling to find belonging within their academic spaces than their white counterparts (Cokley et al., 2017). This sense of lost identity can contribute to anxiety, as POC students have also been cited to log higher levels of anxiety when compared to other student populations (Kodish et al., 2022). Although statistics show POC students have less experience with utilizing mental health services prior to college, they are just as likely to enroll in face-to-face treatment after initial seeking out resources (Lipson et al., 2018).

These characteristics reveal how crucial visibility and identity-based portrayal are for reaching marginalized student populations. Previous studies have attempted to bridge this gap between the visibility of resources and multicultural representation through the strategic placement of mental health services in culturally rich areas on college campuses (Banks, 2017). By introducing mental health as a service in spaces where vulnerable student populations feel comfortable and seen, the influence of cultural stigmas surrounding seeking these resources is greatly reduced (Banks, 2018).

Current discussions about AI tools in college mental health spaces has primarily been limited around chatbots that provide support where there are availability limitations. Some reviews have indicated AI powered mental health chatbots have high user ratings (Olawade et al., 2024). While these and other results are promising, we wanted to focus on the development of a tool that helps students receive individualized resource suggestions that are specific to their institution.

One key source discusses incorporating AI into educational counseling, or helping students find schools and jobs that align with their backgrounds and preferences. This is more closely aligned with our goal in that it accounts for identities and attempts to make “matches” instead of providing mental health aid. Academic counselors are in high demand and must conduct group sessions to meet this. To make these resources more accessible and individualized, one research team designed a system to help high school students select the most appropriate college or university (Majjate et al., 2023).

B.2 Research Gap

Although prior research ventures have tried to address the issue of mental health seeking behaviors among POC college students, there is a gap in utilizing technology as an intervention tool. Firstly, a large sum of the research available on the topic of college students and mental health only identifies the statistically differences between seeking behaviors, while providing a framework for approaching the issue without establishing a solution themselves. To overview the studies that identified outreach to POC students as an essential component in shaping resource seeking behaviors, they accomplished through face-to-face interactions. Although these methods help increase the engagement of

these services among students, it doesn't address the factor of time constraints from the student's perspective or counseling staff's availability. Students may not be able to accommodate in-person health seeking activities within their demanding schedule for academics. If the counseling staff is overwhelmed by student engagement, it may limit the opportunities for these in person interactions to occur. The number of available counselors will certainly outweigh the number of total students on the institution's campus. If POC students are struggling to find time to meet face-to-face with a counselor, they may even be further discouraged when they are loosely paired with a clinician who doesn't share the same identity or cultural experiences as they do.

A limitation to these in person outreach strategies is the over generalization of the student's comfortability with culturally centered places on campus. Some students may be hesitant to disclose their desire to seek mental health services and avoid engagement with on campus outreach coordinators. More work is still needed to understand how much identity acknowledgement is needed for underrepresented students to engage in mental health services while on intuitions of higher education. The research domain should also explore ways that technology can bridge the gap between availability and offering relevant resources to students during the intake process. Although machine learning offers a dynamic approach in using identity characteristics to provide personalized suggestions for treatment, the issue of bias datasets and potentially incorrect information passing should be considered. A larger question can be raised as to how clinicians can utilize a system that recommends useful resources without diluting the efforts human interaction has in this space.

B.3 Literature Summary

In summary, our literature review has informed our proposed solution with the ideation of key features, cautionary limitations, and potential gaps to address. The identity-based motivation theory advises that an effective intervention must feel congruent to the identity of the individuals it's meant to assist. Although higher education institutions provide mental health services to their students, statistics show there is an imbalance of engagement from marginalized student populations. These vulnerable populations of POC students have equal desire to receive treatment, but underlying disparities surrounding stigmas and identity relations often deter these students from seeking out the institute's resources. Research urges the need for outreach through multicultural adaptation of resource offerings and counseling services to help promote POC mental health seeking behaviors. Despite these insightful conclusions, there still exists a gap in how technology can provide personalized attention to wondering students and alleviating understaffed clinicians. In reflection, our team aims to provide supplement POC

student outreach with an on-demand system for resource recommendations accredited by higher education institutions.

Part C: Key informant interview findings

Our key interview was conducted with Dr. Vidal Annan, the Senior Director of the Center for Mental Health Care and Resources (CMHCR). His insights both confirmed many of the findings from the literature review as well as added some nuance about how students at a large, public, R1 experience the issue of mental health care resources and help seeking. Our findings from the interview help to inform the design requirements and constraints for our intervention.

Identity and Tailored Outreach

One central theme that emerged from our literatures search was that of how students of color experience higher levels of imposter syndrome and less utilization of mental health resources before coming to college. Insights from IBM Theory also show that students are more likely to partake in health habits if they feel they align with their identity. These combined factors indicated the need for outreach to be targeted to specific student demographics. Dr. Annan confirmed this sentiment and added an important detail that must be taken into consideration: the current political climate and limitations placed on higher education institutions by the national government on various outreach and diversity efforts. He expressed that the counseling center has been limited in specific outreach targeting various student demographics and has instead acted as universally accessible by all students, stating “We have to make sure that we are marketing to everyone… to stay on the right side of where the political landscape is at this point.” This nuance complicates the suggestion for highly identity based targeting or messaging. An IBM- focused design solution must also adhere to institutional and political constraints on how identity can be incorporated.

Stigma and Access Barriers

Prior research has indicated that stigma around mental health issues, cultural beliefs about help-seeking, and a lack of familiarity of mental health care resources can all lead to a lack of utilization of these resources. Dr. Annan strongly confirmed these findings, saying “If students get to see us, get to talk to us… they might start to break down those walls.” He also expressed that undergraduate students who have never experienced therapy may view therapists as overly analytical, something that outreach events try to assuage. This sentiment ties together the existence of personal barriers and the importance of visibility and outreach in reducing these.

Disparities Amongst Student Groups

Our literature review highlighted some mental health issues that affect minoritized students at a higher rate – including imposter syndrome and a lack of belonging. Dr. Annan noted that while the Center for Mental Health Care and Resources tracks demographics of its users, they have not noticed any changes in representation of race or ethnicity. A limitation of this sentiment could be how the question was asked to focus more on trends instead of overall use. The CMHCR does, however, note that many users have historically been first year students, but they have begun to see more second year students as well because of the lack of targeted resources, specifically from no longer living on campus. It is also important to consider that Georgia Tech may have characteristics that make it differ from national generalizations, such as a higher percentages of international students. We need to ensure our digital health intervention is campus specific to best help our students.

Structural barriers

The literature notes that there are many structural barriers in accessing mental health care, including cost, time, and lack of clarity in how to access services. Dr. Annan confirmed this concept, noting that "some students… feel like this is not something they can access either because they think it costs something or [because of] availability." Since services are free at Georgia Tech, there is no actually cost barrier, but perhaps a perceived one from a lack of information. He also offered some additional context – students are often confused about where to go for specific issues. They may discover after an intake appointment at the CMHCR, they instead need a career coach or academic advisor. Our tool needs to align students' needs with the correct resource efficiently.

AI Integration and Ethical Considerations

The interview contributed a major theme that is not deeply explored in our literature review- concerns around using AI tools for giving students mental health advice. Dr. Annan expressed the view that that there is not currently a role for AI tools to replace human therapy sessions- saying that "Many individuals are using non-counseling AI… and there are risks associated with that…they're nice and agreeable…but they're not going to provide an intervention." He does, however, believe that AI tools could be very beneficial in the areas before and after a student meets with a counselor. He notes that "AI could be good in helping students understand our services better… 'If I have this need, what is available on campus?'" This supports our design criteria of the digital health tool directing students to salient resources instead of attempting to solve the issue.

Part D: A design rationale for and explanation of your prototype.

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D.1 Design Requirements

Our design requirements come from our literature review on inequitable mental health help for students of color and were also narrowed down through our key informant interview. The first design requirement for the prototype is that it must highlight official campus mental health resources and events that are usually scattered across multiple university sites or hard to find. This is a problem that is emphasized in research and practice. During our key informant interview, Dr. Annan noted that students can be uncertain about where to go when they need support and sometimes schedule appointments only to find out that they needed a different service (i.e. career coaching, academic advising). Literature that was found relating to this also stated that there was structural barriers and confusion around resource navigation, which shaped our first design requirement where our system should function as a centralized, university validated hub that reduces the fragmentation of resources and presents information in a clear and consistent way for students to refer to.

The system should also align with students' identities and experiences to increase comfort, trust, and likelihood of seeking support. The literature highlighted identity-based motivation as an important technique for engaging marginalized groups. Additionally, Dr. Annan supported this by explaining that tailored outreach could be useful, but it is also important to be cautious about appearing to target specific marginalized groups because of current political pressures. This shaped our requirement that the system should offer identity-aligned personalization only when it is provided voluntarily by the student, and it should show the student culturally relevant or identity-specific resources (i.e. cultural support groups, school-year study groups). This creates a balance between using identity-based motivation for our prototype and the real institutional limitations that we learned from our key informant interview.

The design should decrease logistical and psychological barriers like time constraints, uncertainty, stigma, and misconceptions about cost. Dr. Annan spoke about how many students avoid using campus mental health resources because they think services cost money or have long wait times, which is not true because services are usually free and are available within 2-3 days. In fact, he stated during his interview that the office has been recording the average time between when a student requests an appointment and gets seen, and it has stayed low, at about 2.5 days. To address these challenges, the system should have clear language, friendly visual design, and offer clear explanations of what the services involve. The system should also decrease the work done by students by offering fast and intuitive navigation to what the student is requesting and reducing the effort needed to find the support they need.

Lastly, the system should work with existing university websites and only use official institution approved resources.

D.2 Prototype Key Features and Innovations

Our prototype is a centralized chatbot acting like a "digital front desk" that appears on the CMHCR website and can be integrated with any college's mental health website. This creates a space for students to find different campus mental health resources. The chatbot sits on top of official GT pages, which can be seen in Figure 1. The conversational interface that it has helps reduce the confusion and fragmentation of mental health resources that is emphasized in the literature review and our key informant interview.

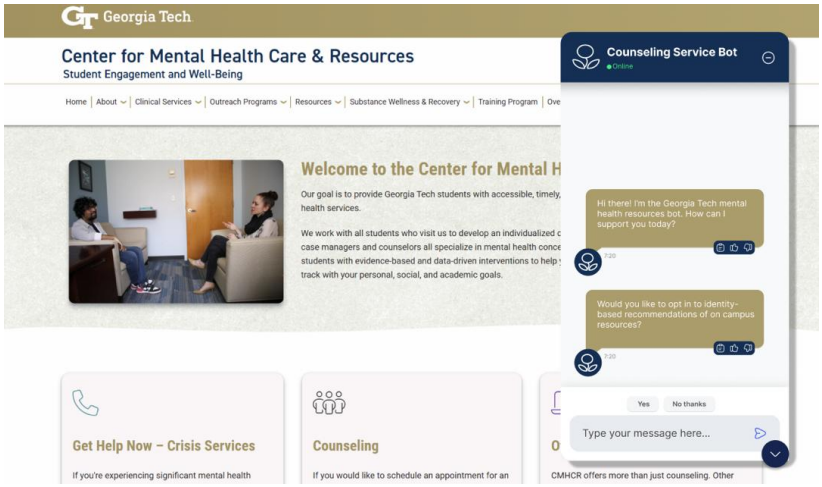

Figure 1: Chatbot embedded directly on the CMHCR campus website

A key innovation of this prototype is the optional identity-based personalization workflow, meaning students can provide information like race/ethnicity, gender, and student classification if they decide to. This screen can be seen in Figure 2. Based on what the student chooses, recommendations will be provided to them, and this is also demonstrated in the prototype based on if you opt into giving demographic information or not (2 different interactive pathways). When students participate, the system shows them groups and identity-specific support options to help increase visibility for marginalized students and better align with their identity. This shows a balance between identity-based motivational design and institutional constraints because the system only uses identity features when they are offered

by the student. This feature satisfies our second design requirement to algin resources with a student's identity in a way that feels comfortable to them. What is important is that this workflow is completely optional, which addresses Dr. Annan's point about avoiding targeted messaging.

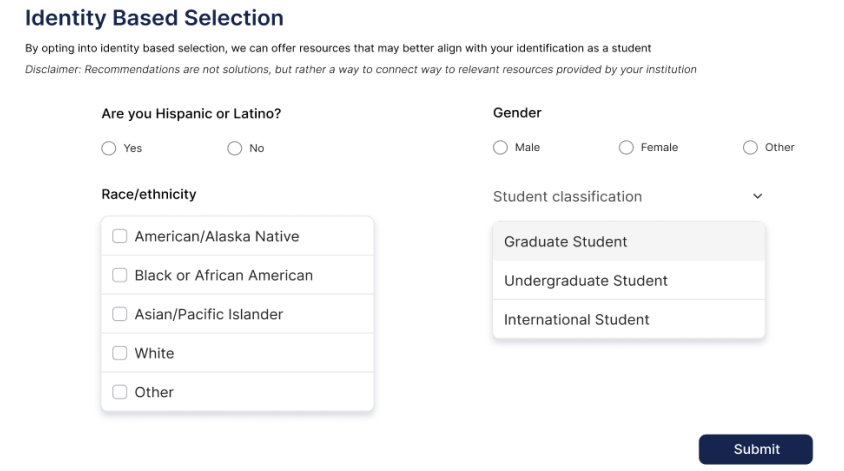

Figure 2: Identity-Based Personalization Selection Prototype Screen

The prototype also reduces accessibility barriers by using clear language, good explanations of the care that is offered by the school, and quick reply to categories. The Figma Design shows the chatbot's casual/supportive tone and simple message prompting which makes the student feel comfortable and lowers the stigma around asking for help. Additionally, while the chatbot directs students to appropriate campus services based on their needs, it does not try to act like a clinician or provide clinical advice since its role is limited to navigation and information. The interactions the student can have with the system also clarifies common misconceptions, for example the chatbot emphasizes that care is free when asked by the student. This addresses the third design requirement of reducing logistical and psychological barriers and responds to barriers described by Dr. Annan which as students assuming care is expensive or unavailable. This can be seen in Figure 3. Lastly, the UI is clean and minimalistic which allows students to get a clear understanding of what the chatbot is conveying and gives them a seamless transition between the chatbot and official university mental health resources.

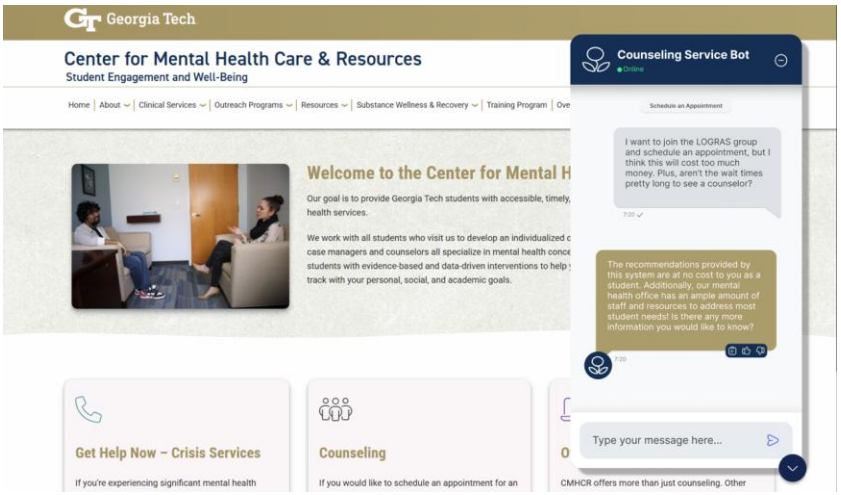

Figure 3: Chatbot clarifying cost and time

D.3 Why this prototype addresses your chosen health disparity topic

The prototype has the potential to positively address mental health service disparities for students of color because it directly targets the key barriers that were identified during our research that prevent their engagement. The optional identity-based personalization feature uses the Identity-Based Motivation Theory by allowing students to opt for identity relevant resource recommendations, only when they voluntarily provide their demographic information. This makes sure that the recommendations feel congruent with their identity (Oyserman & Destin, 2010). This also directly addresses the lack of cultural relevance that keeps POC students from getting help while keeping respect for institutional constraints, which were noted by Dr. Annan. Additionally, the chatbot's private and 24/7 design decreases stigma because it allows students to find suitable resources without being face-to-face with someone, which addresses the discomfort POC students have when they have less previous experience with mental health services (Lipson et al., 2018). Therefore, this prototype lowers the beginning barriers that our literature review and key informant interview show initially stop POC students from accessing mental health treatment.

D.4 Relevant ethical considerations

Two main ethical considerations should be made if this prototype was deployed into a real-world setting. Firstly, data privacy and security is an important ethical consideration, since the chatbot collects sensitive demographic and mental health information from students. The system should follow FERPA regulations and have good encryption so that no one that is unauthorized can access the information. Additionally, the identity form should notify students clearly that it is voluntary and should explain how the data will be used. This is important because when using this, students should feel confident that giving the chatbot their personal information will allow them to find the resources they need and will not result in unwanted targeting.

Another ethical consideration that needs to be made is that the chatbot must be carefully designed to avoid stereotyping students based on their identity characteristics. Although the system can give the student culturally relevant resources when the students give demographic information, it should not ever make assumptions about what support a student might need based on the identity that the student inputs. This means that all of the resources should be accessible to all students with identity-aligned options given to the students as optional suggestions instead of hard recommendations. Additionally, as Dr. Annan emphasized about the appropriate use of AI tools, the scope of the system should be only navigation and information offering through campus mental health resources with clear links/paths to resources that can respect each student's unique needs and experiences.

Project team members' contributions

Our project team divided the work for the assignment to best leverage each of our strengths. Tristan set up the paper formatting, began the literature review, and wrote the research question background. He also developed the Figma prototype, incorporating input from Isabel and Asmita. Isabel created the references within EndNote to insert the citations and create the reference list, extracted the questions we asked in the interview to include in the appendix, wrote the key informant interview section, and added to the literature review. Asmita wrote the design requirements and rationale, as well as the explanation of the prototype.

Prototype Link

Generative AI Statement

We have used generative AI to prepare this assignment. We used generative AI in the following ways during the preparation of this assignment: upload the interview transcript to extract the questions asked by the project group as well as quotes from Dr. Annan that supplemented each of the themes we discussed.

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Appendix

Questions asked in Key Informant Interview

- Are there any present strategies that you all have that are centered around reaching out to underrepresented students?
- With that targeted tabling, when a specific group invites you to come, is the information catered toward that audience, or is it more one-size-fits-all?
- Do you see or think of any potential barriers that may stop students from engaging with outreach opportunities, even in specialized or general settings?
- In your opinion, is there much that can be done about the stigma around mental-health help-seeking, or is it too deeply rooted in culture/upbringing to combat?
- You mentioned success—what metrics do you have, either qualitative or quantitative, to measure the success of your efforts?
- Do you notice certain points in the semester, or an overall trend, where your office is not able to meet demand? And what does your off-boarding process look like when long-term weekly sessions aren't feasible?
- Do you notice any trends in which students are or are not participating in services, compared to overall campus demographics?
- How do you feel AI could address student barriers to accessing services, in an ethical way?
- Is there already something in place—like a survey students complete before signing up—that captures what kind of help they want?
- Do clinicians ever use data from students' wearable devices—like Apple Watch sleep or activity data—to support treatment?