

Investigating Compounding Impacts of Racism & COVID-19 on Learning & Employment in Computing & Technology (CIRCLE-CT)

Findings From Survey 2 - Fall 2020



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INTRODUCTION

This report is the product of a collaborative study launched in summer 2020 to understand the impact on the U.S. technology community of the COVID-19 pandemic and the heightened attention to racism and anti-racism. The focus of the CIRCLE-CT project is on the impact of the “dual pandemics” the tragic and tumultuous times we have all experienced since COVID-19 was recognized and George Floyd was killed--on individuals within the computing and technology community and the organizations in which they work and study. Our survey respondents include technologists working in industry, individuals who work and study in computing programs at U.S. colleges and universities, and K-12 computing teachers. In our analyses we pay particular attention to the experiences of persons from minoritized and marginalized groups.

The study plan includes three surveys and a set of interviews. Survey 1 was administered in summer 2020 and was designed to document the immediate impacts of the dual pandemics as the world pivoted so quickly. The report and dashboard for Survey 1 can be found [here](#).

Survey 2 was fielded between September 30 and November 2, 2020 and looked to document mid-term impacts of the pandemic and racial justice movements on the educational and work experiences of those in the technology community. For context, during this time period, we observed the following conditions:

COVID-19

While records were being set for daily hospitalizations and deaths in many U.S. states, the nation still had not reached the peak of COVID-19-related deaths; vaccines were still under development with uncertain timelines for roll-out; and initial COVID-19 relief aid had been distributed.

ATTENTION TO RACISM

Weekly, if not daily, news reported additional Black people dying at the hands of police; protests continued around the nation; and many companies, educational institutions, and individuals grappled with racism through statements, policies, and education.

In the second survey, we explored the dual pandemic’s effects on psychosocial constructs such as belonging and persisting in technology, feeling like work matters, and level of commitment to our organizations/institutions. Questions also explored the effects on career-building activities such as conferences, networking, leadership skill development, and research. As in Survey 1, we asked respondents about support policies and programs at their organizations such as equitable recruitment and hiring processes, professional development opportunities, caregiver support, etc. Several questions focused on respondents’ ability to participate in and see the effects of broadening participation- type activities, such as identity-focused computing groups and diversity-focused conferences.

In line with Survey 1 findings, Survey 2 revealed differing impacts of the COVID-19 pandemic and 2020 social justice movements on demographic, identity, and professional groups. We highlight some of these differences in the pages that follow. Please explore the data in more depth on the CIRCLE-CT Survey 2 Dashboard (bit.ly/Circle-CT).

KEY FINDING 1:

TO RETAIN POST-SECONDARY STUDENTS, CONTINUE OUT-OF-CLASS ENGAGEMENT

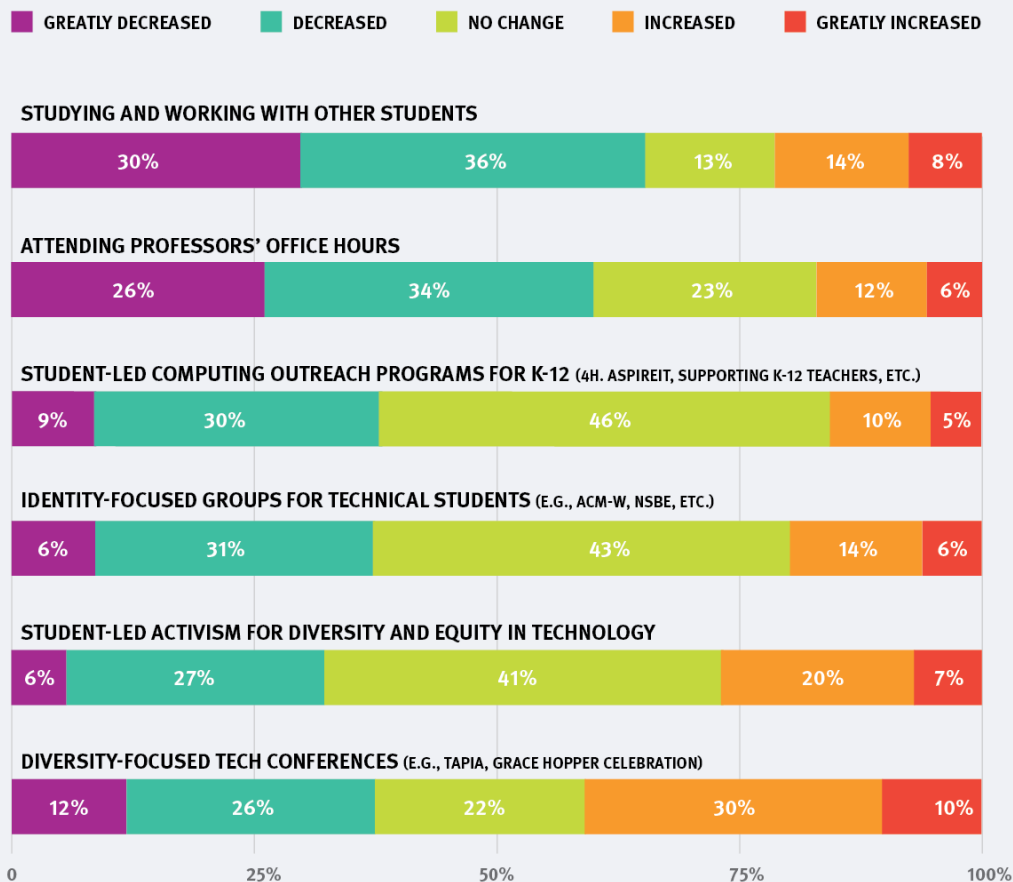
As other studies have reported, the pandemic necessitated a shift in approaches to teaching and learning, and impacted practices that extended beyond the classroom. Our survey asked computing faculty and college students about the impact of COVID-19 and the heightened attention to racism on the ability to support/participate in out-of-class activities, which can provide support for building student community, identity, and support.

The following describes results from 585 post-secondary students who completed Survey 2. For detailed demographic characteristics, go to the CIRCLE-CT Survey 2 Dashboard (bit.ly/Circle-CT).

COVID-19 Impacts

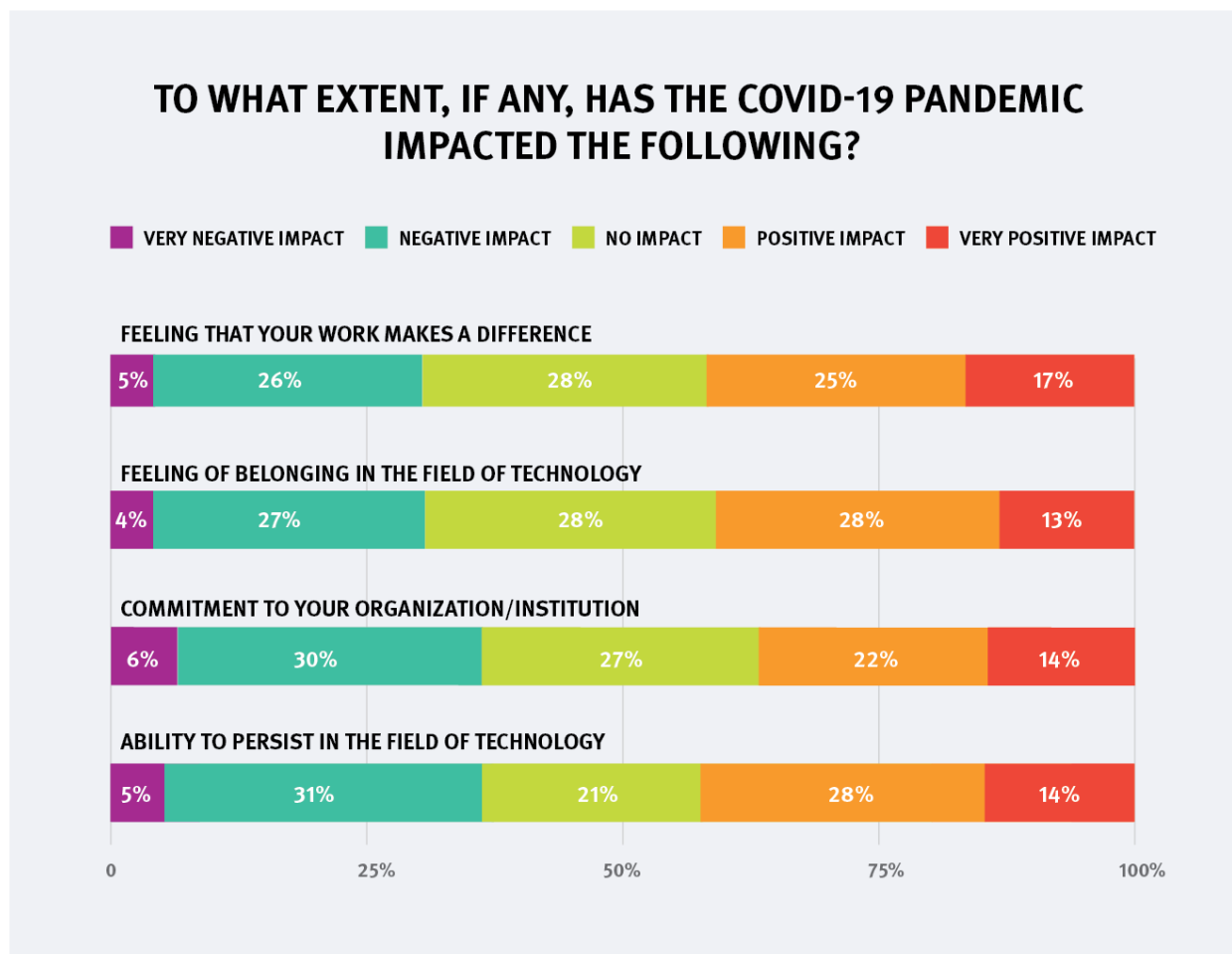
WORKING WITH OTHERS. As shown in the following figure, the ability to work with others and attend office hours were most negatively impacted by the pandemic. Specifically, the majority of computing students (65%) report that their participation in study groups decreased, with almost half of those students reporting that this support greatly decreased. Similarly, most students report that their attendance at professors' office hours (60%) decreased, and a majority of faculty (64%) report that the pandemic impacted their ability to offer student support for their computing coursework outside of class. More than a third of students report a decrease in participation in student-led computing outreach activities as a result of COVID-19, which aligns with the outcomes shared by faculty; a majority of faculty indicated that the pandemic limited their ability to organize student clubs or mentor students.

INDICATE HOW YOUR PARTICIPATION IN THE FOLLOWING ACTIVITIES HAS CHANGED DUE TO THE COVID-19 PANDEMIC:



OUT-OF-CLASS ACTIVITIES. When asked about out-of-class activities related to academic research training and professional development, different groups of students responded in significantly different ways. Given the challenges faced by international students in 2020 with securing visas to study in the U.S. due to the pandemic as well as the political climate, it is somewhat surprising that international students seemed to fare better than their domestic counterparts in these areas. Compared to international students, domestic students tend to report greater negative impacts of COVID-19 on their ability to work on research projects, domestic: 2.53, international: 2.92, (scale= 1=very positive impact to 5=very negative impact). Similarly, domestic students report greater negative impacts on growing their professional connections and domestic: 2.30, international: 2.66, (scale= 1=very negative impact to 5=very positive impact).

INDICATORS OF PERSISTENCE. We also asked students about the impact of the pandemic on several indicators of persistence: feeling that your work makes a difference, sense of belonging in technology, commitment to your institutions, and ability to persist in the field of technology. Overall, student responses tend to fall in a “normal distribution” pattern of impact, with approximately the same percentage of students reporting positive impacts on these indicators as reporting negative impacts. Disaggregation by demographic groups shows different experiences. For example, students who identify as LBGTQIA+ report greater negative impacts on feeling a sense of belonging (means of 2.92 vs. 3.24) and ability to persist in computing (2.82 vs. 3.19) due to COVID compared to their non-LBGTQIA+ peers.



LBGTQIA+ students also report greater negative impacts on their ability to receive mentorship, provide mentorship, work on research projects, grow leadership skills, contribute to their field, and pursue professional opportunities compared to their non-LBGTQIA+ peers in computing. In contrast, the shift to online delivery of career development opportunities may have had positive impacts for Black students, who report greater increases in receiving mentorship and growth of professional connections compared to their non-Black peers.

OUT-OF-CLASS ACTIVITIES CORRELATED WITH PERSISTENCE. To explore how students' reports of impact on participation in out-of-class activities due to the COVID-19 pandemic may be related to these indicators of persistence, we applied a multiple regression analysis to look for significant interactions and then conducted a statistical pairwise ANOVA analysis for each item. As shown in the table, for every out-of-class activity we asked about, those who report an increase in participation in the activity as a result of the pandemic tend to report fewer negative impacts on those attitudes and beliefs that are indicators of persistence in computing.

Increases in participation in student-led activism seem to have the greatest impact on these indicators of retention. As students reported an increase in student-led activism due to COVID, they also reported increases in feeling that their work makes a difference, a feeling of belonging in tech, and an ability to persist in the field. Additionally, student-led computing outreach to K-12 had similar interactions. As students reported increased participation in these activities, their feeling that their work made a difference, ability to persist, and feeling of belonging in tech increased.

DIFFERENTIAL IMPACTS AMONG STUDENTS WHO REPORT AN INCREASE VS. DECREASE IN OUT-OF-CLASS ACTIVITIES

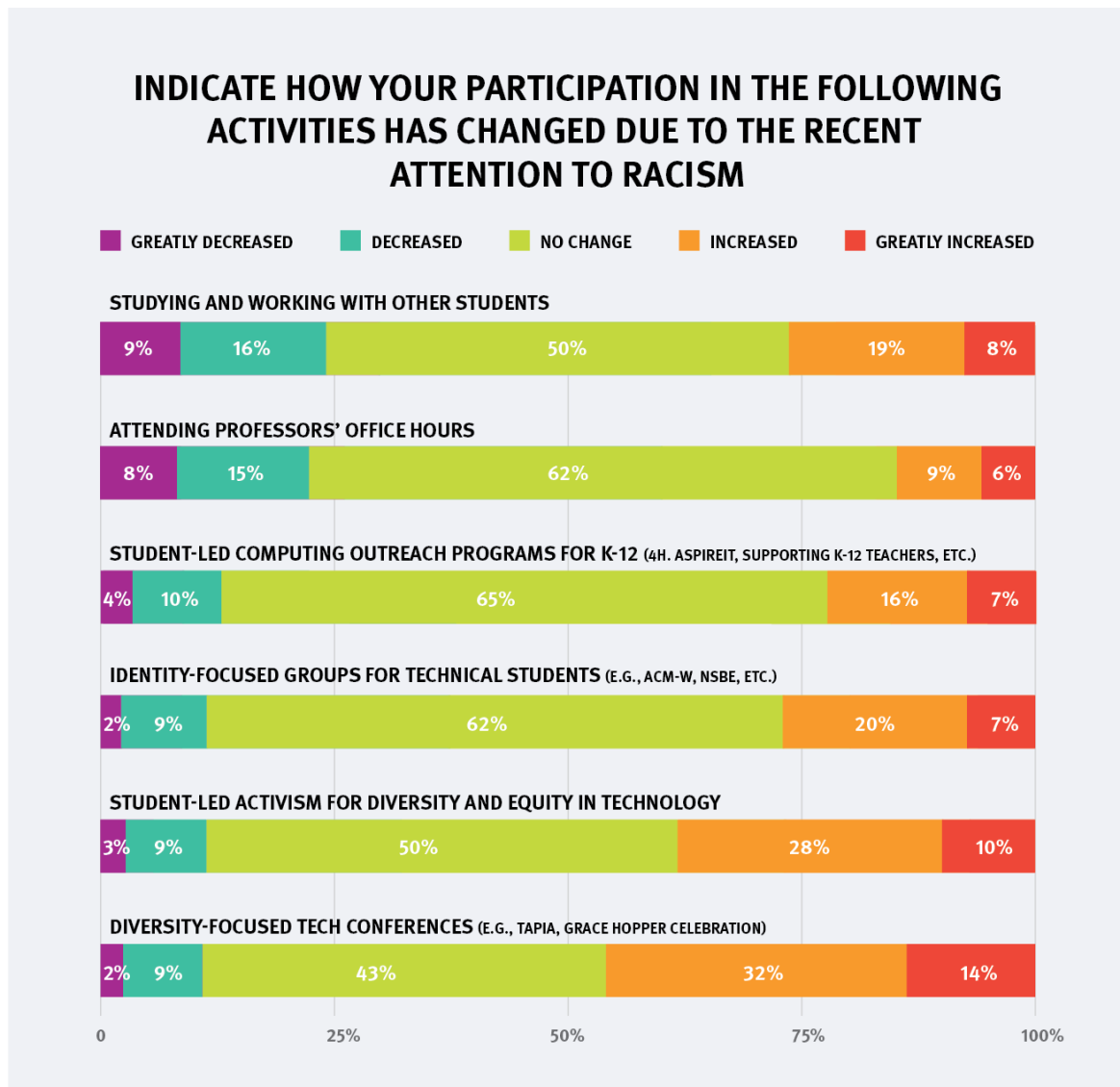
| COVID impacted my participation in: | Feeling that your work makes a difference | Commitment to your organization | Ability to persist in the field of tech | Feeling of belonging in the field of tech |
|---|---|---------------------------------|---|---|
| Attending prof office hours | 0.74* | 0.78* | 0.65 | 0.6 |
| Student-led computing outreach for K12 | 0.85 | 0.68 | 0.84 | 0.88 |
| Student-led activism for DEI | 0.92* | 0.74 | 0.92* | 0.84* |
| Diversity-focused tech conferences | 0.51 | 0.55 | 0.67 | 0.53 |
| Identity-focused groups for tech students | 0.66 | 0.68 | 0.69 | 0.68 |
| Studying & working with other students | 0.78 | 0.83 | 0.77 | 0.71* |

Note: Entries marked with an asterisk indicate a statistically significant interaction in the multiple regression analysis, with the numeric entries in the table showing the difference between the means for students reporting an increase in each listed activity versus students who reported a decrease in that activity.

Impacts of the Heightened Attention to Racism and Calls for Racial Justice

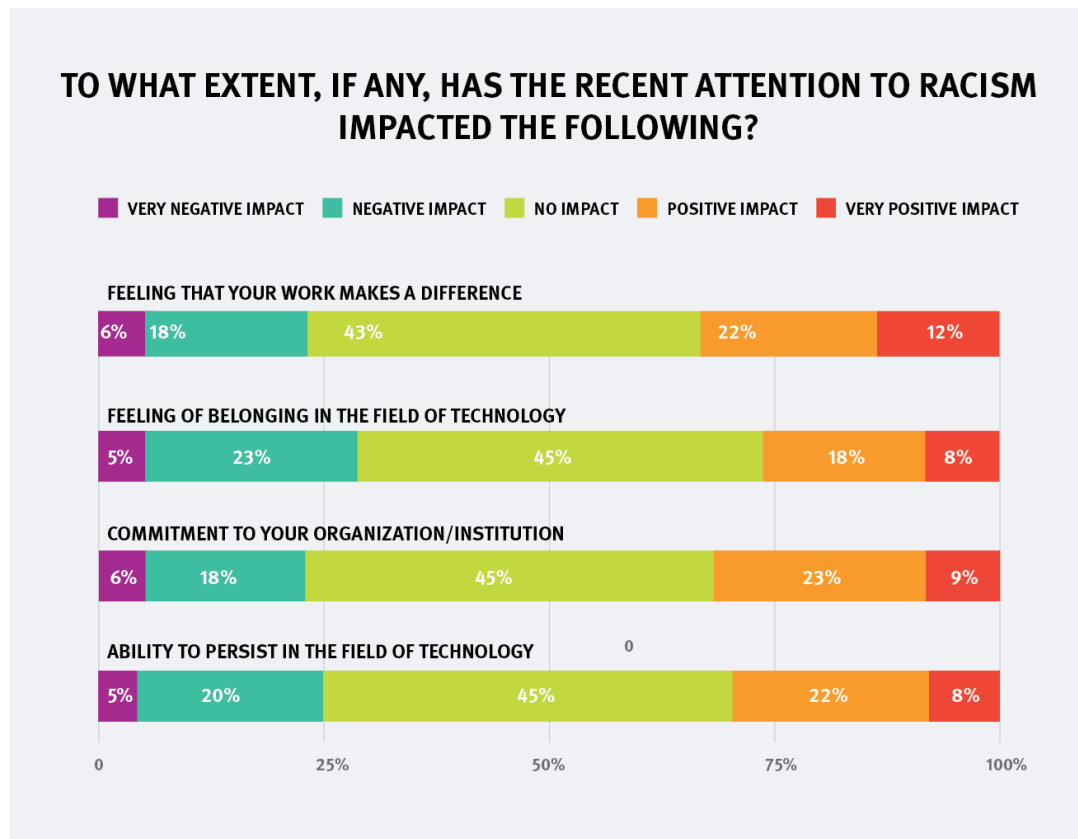
WORKING WITH OTHERS. The ability to work with others and attend office hours were the most negatively impacted due to the heightened attention to racism. Interestingly, nearly twice as many students in computing degree programs report increases as those reporting decreases in their participation in the following: K-12 outreach; identity-focused student groups; student-led activism for diversity, equity, and

inclusion; and diversity-focused conferences. This points to both increases in motivation to participate, and perhaps, increases in access and opportunity provided by more meetings and events being hosted online due to the COVID-19 pandemic. Thus, we recommend continuing to provide online and asynchronous means for students to participate in actions for racial justice.



INDICATORS OF PERSISTENCE. As with the COVID-19-related section, we asked students about the impact of the recent attention on racism on key indicators of persistence: feeling that your work makes a difference, sense of belonging in technology, commitment to your institutions, and ability to persist in the field of technology. In contrast to the reported impacts of the COVID-19 pandemic, far more students reported that the recent attention to racism did not change their perceptions in these categories. To put this into context,

a majority of students indicated that their institutions supported anti-racist actions of individuals (60%) and that their institutions made changes that align with the antiracism values expressed in formal communications (68%). Aligned with results reported in Finding 3, Black students report higher values for being a spokesperson for their racial or ethnic group ($p < 0.01$, Cohen's $d = 1.10$) and being singled out because of their race or ethnicity compared to non-Black students ($p < 0.01$, Cohen's $d = 0.69$).



OUT-OF-CLASS ACTIVITIES PREDICTING PERSISTENCE. Similar to our analysis for COVID, we explored how students' reports of impact due to the attention to racism and the calls for racial justice on participation in out-of-class activities may related to these psychosocial indicators of persistence. Consistent with our other findings, those who report an increase in activity participation as a result of the attention to racism reported fewer negative impacts on indicators of persistence. Students who report an increase in student-led activism due to the recent attention to racism also report increases in feeling that their work makes a difference. In contrast to the COVID-19 findings, statistically significant interactions were not found relative to increases in participation in student-led activism and increases in the ability to persist or a feeling of belonging in tech. Increases in participation in student-led activism significantly predicted increases in commitment to the organization among students (a significance not present for increases in activism due to the COVID-19 pandemic). Importantly, students who reported increases in studying and working with other students as a result of the recent attention to racism also report increases not only in the feeling of belonging in tech, but also in their ability to persist in the field.

DIFFERENTIAL IMPACTS AMONG STUDENTS WHO REPORT AN INCREASE VS. DECREASE IN OUT-OF-CLASS ACTIVITIES

| The recent attention to racism and calls for racial justice impacted my participation in: | Feeling that your work makes a difference | Commitment to your organization | Ability to persist in the field of tech | Feeling of belonging in the field of tech |
|---|---|---------------------------------|---|---|
| Attending prof office hours | 0.94 | 1.07 | 0.87 | 0.8 |
| Student-led computing outreach for K12 | 0.99 | 1.11 | 1.22* | 1.14 |
| Student-led activism for DEI | 1.06* | 1.14* | 0.99 | 0.93 |
| Diversity-focused tech conferences | 0.97 | 0.86 | 0.99 | 0.86 |
| Identity-focused groups for tech students | 1.03 | 1.08 | 1.21 | 1.19 |
| Studying and working with other students | 0.79 | 0.84 | 0.89* | 0.82* |

Note: Entries marked with an asterisk indicate a statistically significant interaction in the multiple regression analysis, with the numeric entries in the table showing the difference between the means for students reporting an increase in each listed activity versus students who reported a decrease in that activity.

KEY FINDING 2:

THE COVID-19 PANDEMIC IS IMPACTING CAREERS

CAREER DEVELOPMENT. The responses necessitated by the COVID-19 pandemic--working and learning from home,¹ cancelling or transitioning conferences and in-person meetings to online and curtailing human interaction and travel--have had particularly negative impacts on technology professionals' ability to grow and develop their careers.² Seventy percent of respondents reported negative impacts of the COVID-19 pandemic on both their ability to network in their organizations and in their field.

Those who are earlier in their careers tend to be having a tougher time. For example, respondents working in industry at the entry-level are significantly more likely than those at mid-senior or executive levels to report negative impacts on their ability to network with influential individuals in their organization ($p < .05$, Cohen's $f = 0.13$). Likewise, those who are early in their industry career are significantly more likely to report negative impacts on their ability to grow a network of connections ($p < .01$, Cohen's $f = 0.11$). The effect size is small, however, reflecting the reality that regardless of seniority, the ability to network has been negatively affected. Similarly, 87% of college faculty who are tenurable but not yet tenured report negative or very negative impacts on networking. In fact, no respondent in this group reported a positive impact on networking. This is significantly different from those who are tenured or in positions that are not tenurable ($p < .01$, Cohen's $f = 0.27$). While untenured professors may be more likely to report negative impacts, as in industry, the pandemic is impacting to some extent all levels' ability to network. This is not a trivial impact. The ability to network with influential people in one's organization, institution or field is significantly correlated with one's ability to persist in the field of technology ($p < .01$, $r = 0.29$) and with feelings of belonging in the field ($p < .01$, $r = 0.32$).

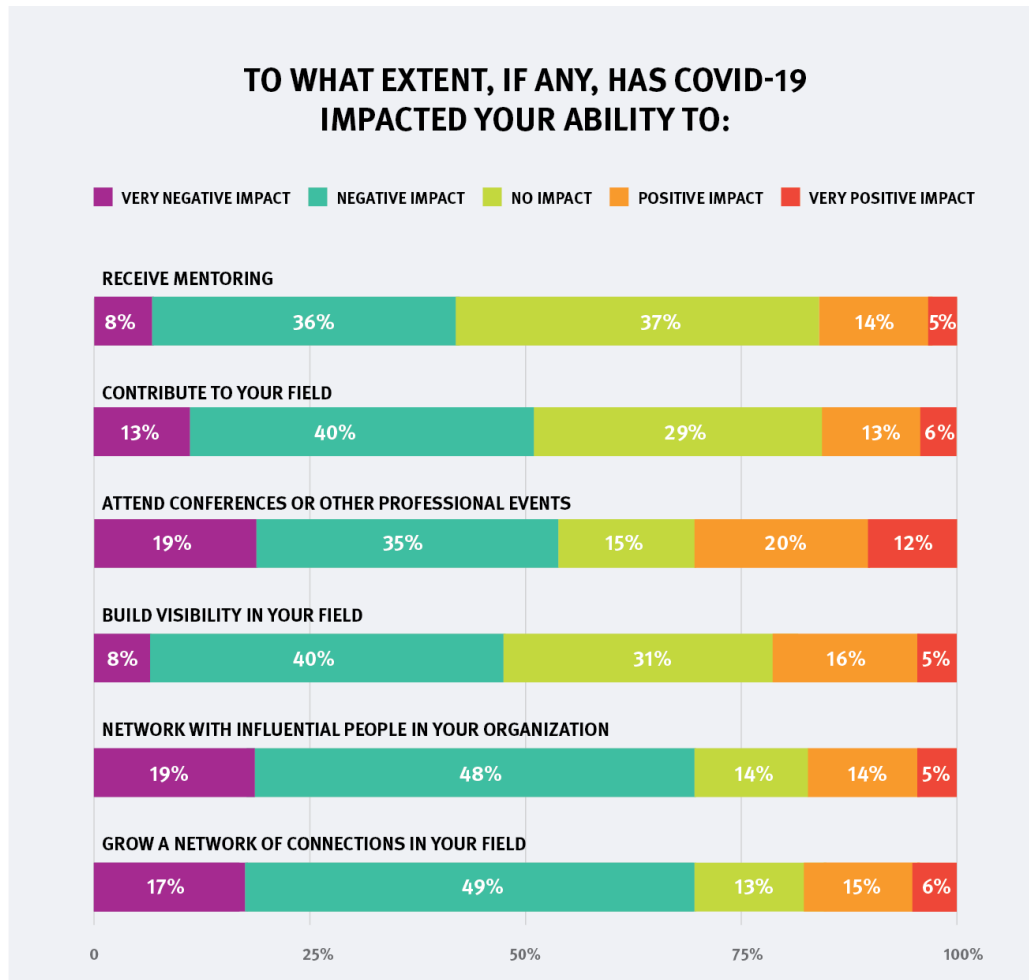
CONFERENCES AND MEETINGS. Moving conferences and professional meetings online has had varied impacts. While over half (54%) of respondents report negative impacts on their ability to attend conferences or other professional events, a third report positive impacts. Moving conferences online may have allowed individuals to participate who would otherwise have been unable to due to insufficient travel resources or time.

ABILITY TO WORK. The pandemic has had varied impacts on the actual work of respondents. In terms of contributing to one's field, more than half of respondents report negative impacts of COVID-19, while almost a third report no impact (perhaps due to the digital nature of work in the field). Looking at impacts on research work in particular, 51% of higher education respondents reported negative or very negative

¹ Respondents working in industry, government and non-profit organizations are significantly more likely to report working fully remote (94%) compared to those working in higher education (66%) who tend to report working a mix of remote and in-person. Very few respondents report working fully in-person.

² The analyses in this section are confined to respondents working in higher education and K12, in industry, nonprofits and government. K12 teachers and college students and those not currently employed were not included in these analyses.

impacts of the pandemic (with 31% reporting no impact). Importantly, for higher education professionals, negative impacts on research is correlated with lowered commitment to one's organization ($p < 0.01$, $r = 0.36$), decreased ability to persist in tech ($p < 0.01$, $r = 0.38$) and lower feelings of belonging in the field ($p < 0.01$, $r = 0.40$).



LEADERSHIP. Questions about leadership revealed an interesting pattern: Those who are already established in leadership positions are more likely to report growing in those roles than their more junior colleagues are to move into them. Over a third of respondents report positive or very positive impacts of COVID on their ability to grow their leadership skills, and those reporting positive impacts tend to be those already in leadership positions ($p < 0.01$, Cohen's $d = 0.27$). Looking just at academia, 47% of tenured professors report positive impacts on growing their leadership skills compared to 9% of untenured respondents and 45% of non-tenurable respondents.

TO WHAT EXTENT HAS COVID-19 IMPACTED YOUR ABILITY TO:

■ VERY NEGATIVE IMPACT
 ■ NEGATIVE IMPACT
 ■ NO IMPACT
 ■ POSITIVE IMPACT
 ■ VERY POSITIVE IMPACT

ADVOCATE FOR DEI IN YOUR ORGANIZATION/INSTITUTION/FIELD



PROVIDE MENTORSHIP



GROW YOUR LEADERSHIP SKILLS



0 25% 50% 75% 100%

DEI. In terms of advocating for diversity, equity and inclusion (DEI) in their organization, almost a third (32%) of respondents report positive or very positive impacts of the pandemic on their efforts with surprisingly few reporting negative impacts (24%). In higher education, those with formal leadership positions in their organizations are more likely to report positive or very positive impacts (47%) compared with those who do not have formal leadership roles ($p < .05$, Cohen's $d = 0.48$). Those not in formal leadership positions are more likely to report no impacts (45%) or negative impacts (34%) from the pandemic. In industry, the impacts are similarly mixed with 20% reporting negative impacts, 48% reporting no impacts, and 32% reporting positive impacts.

KEY FINDING 3:

DUAL PANDEMICS AFFECT BLACK PEOPLE DIFFERENTLY THAN OTHER RESPONDENTS

While the racial justice movements across the country during the past year have included a push for equity for all minoritized persons, so much violence and activism has centered on Black people specifically that this group has likely experienced the past year differently than others. Just over 7% of our sample identify as Black or African American (including 1.3% who identified as Black and another race/ethnicity). This percentage is close to the percentage of those in computing occupations who identify as Black (9.1%) and of CS bachelor's degree holders who identify as Black (8.93%).³

In our survey we asked about the extent to which the recent attention to racism impacted:

- Feeling of belonging in the field of technology, Ability to persist in the field of technology
- Commitment to your organization/institution
- Feeling that your work makes a difference.

We also asked respondents how their work or school experiences had changed in the prior 6 months along several parameters, including:

- Observing sexist or racist behavior, being singled out because of race/ethnicity,
- Being asked to be a “spokesperson” for your racial/ethnic group,
- Feeling ignored or devalued because of your race/ethnicity or gender.

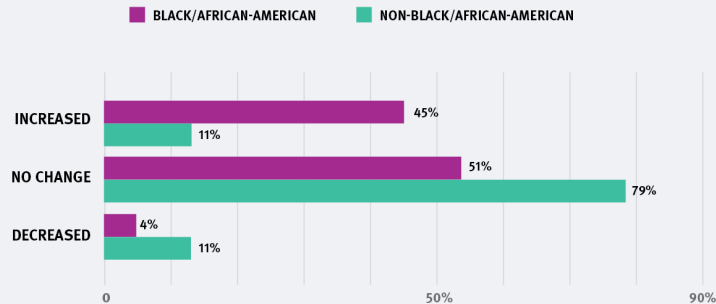
Given the societal context and the potential for important differential impacts, we examined findings for Black persons compared to people from other racial/ethnic groups. In general, Black people had many statistically significantly different responses than those who did not identify as Black or African American.

General Reflections

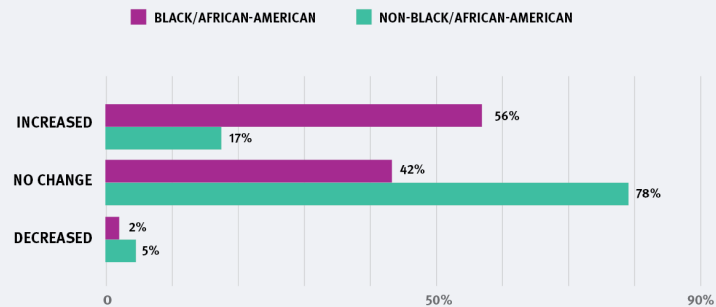
When asked to reflect on the prior six months (approximately March 2020 to October 2020), Black people in industry report being singled out for their race/ethnicity ($p < .001$, Cohen's $d = 0.89$) and being asked to be a spokesperson for their race/ethnicity ($p < .001$, Cohen's $d = 0.992$) significantly more than non-Black people in industry. These large effect sizes suggest that Black people in industry are having substantively different experiences regarding race than are others in industry. They also report observing racist behavior significantly more than non-Black people in industry ($p < .01$, Cohen's $d = .47$).

³ NCWIT Scorecard: The Status of Women in Computing [2020 Update] <https://ncwit.org/resource/scorecard/>

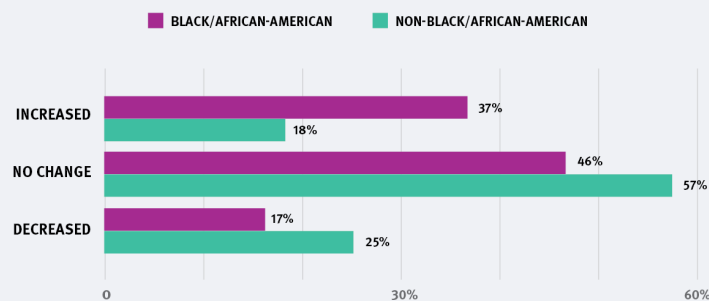
NEARLY HALF OF BLACK PEOPLE IN INDUSTRY REPORT THAT BEING SINGLED OUT FOR THEIR RACE/ETHNICITY HAD INCREASED OR GREATLY INCREASED IN PRECEDING 6 MONTHS



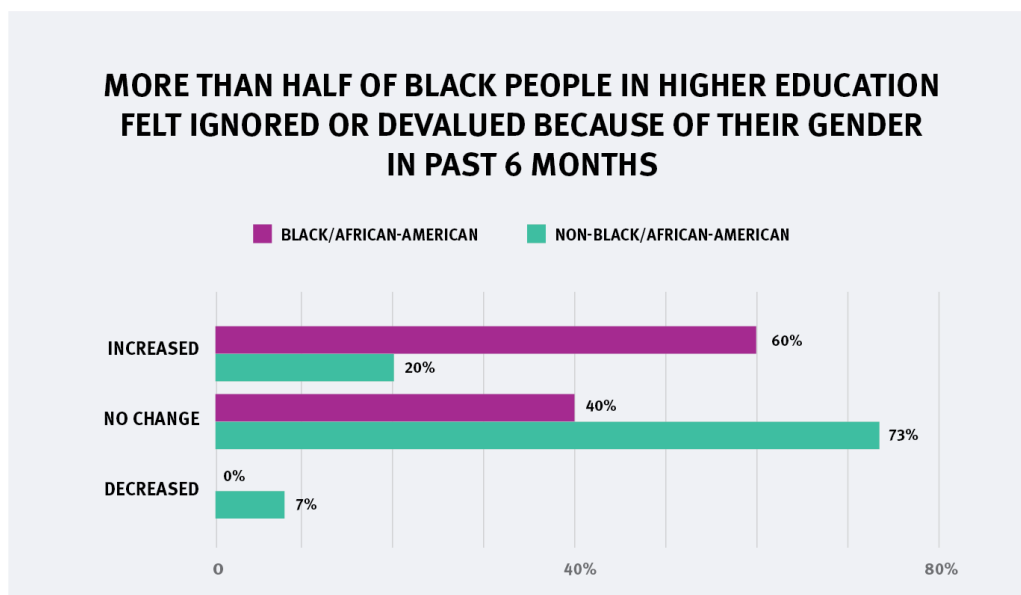
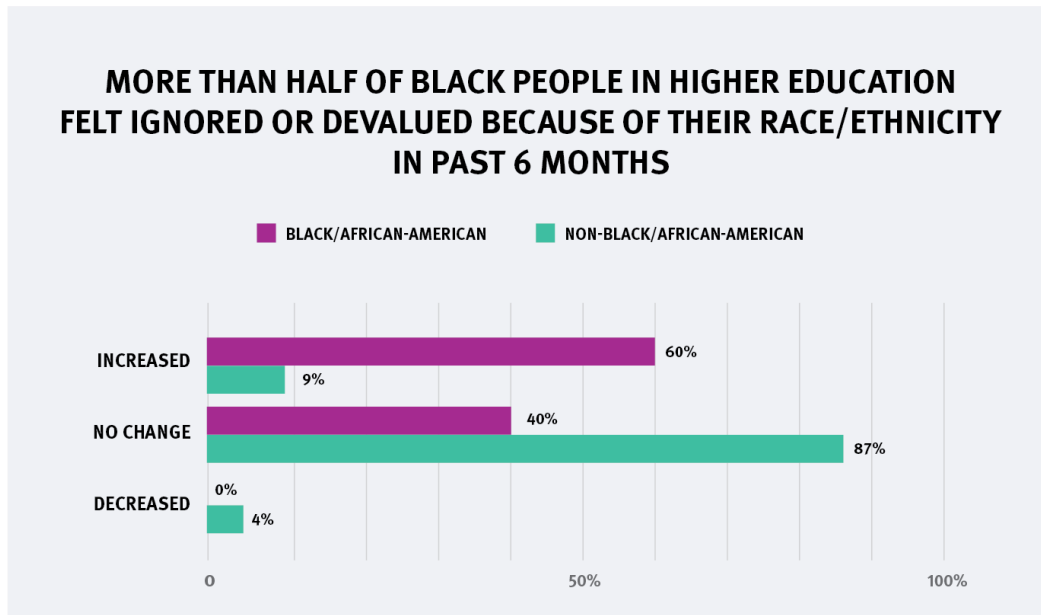
MORE THAN HALF OF BLACK PEOPLE IN INDUSTRY REPORT BEING ASKED TO BE A SPOKESPERSON FOR THEIR RACE/ETHNICITY HAD INCREASED OR GREATLY INCREASED IN PRECEDING MONTHS



OVER ONE-THIRD OF BLACK PEOPLE IN INDUSTRY REPORT OBSERVING RACIST BEHAVIOR IN PRECEDING 6 MONTHS



Black people in higher education also report some notably worse outcomes than other respondents, but on different items. For example, reflecting on the prior six months, Black people in higher education feel more ignored or devalued because of their race ($p < .01$, Cohen's $d = 1.48$) or gender ($p < .05$, Cohen's $d = .984$), and report that COVID-19 had interfered with their ability to network with influential people ($p < .01$, Cohen's $d = 0.59$).



Impact of Heightened Attention to Racism

In industry, Black people did not report significantly different reactions due to the national attention to racism, however for Black respondents working in higher education, there are several disturbing findings. They report that the recent attention to racism has negatively impacted their commitment to their

institution ($p < .01$, Cohen's $d = 0.90$), as well as feeling that their work was making a difference ($p < .001$, $D = 1.16$), and has inhibited feelings of belonging in technology ($p < .05$, Cohen's $d = 0.90$). They also report that the increased attention to racism is affecting their ability to persist in the field ($p < .001$, Cohen's $d = 1.57$). The notably high effect sizes here again suggest that the heightened attention to racism has affected Black persons in substantially different ways than it has non-Black people. Why that is (i.e., what specific fallouts from the attention to racism have contributed to these differential impacts) is fodder for future qualitative research.

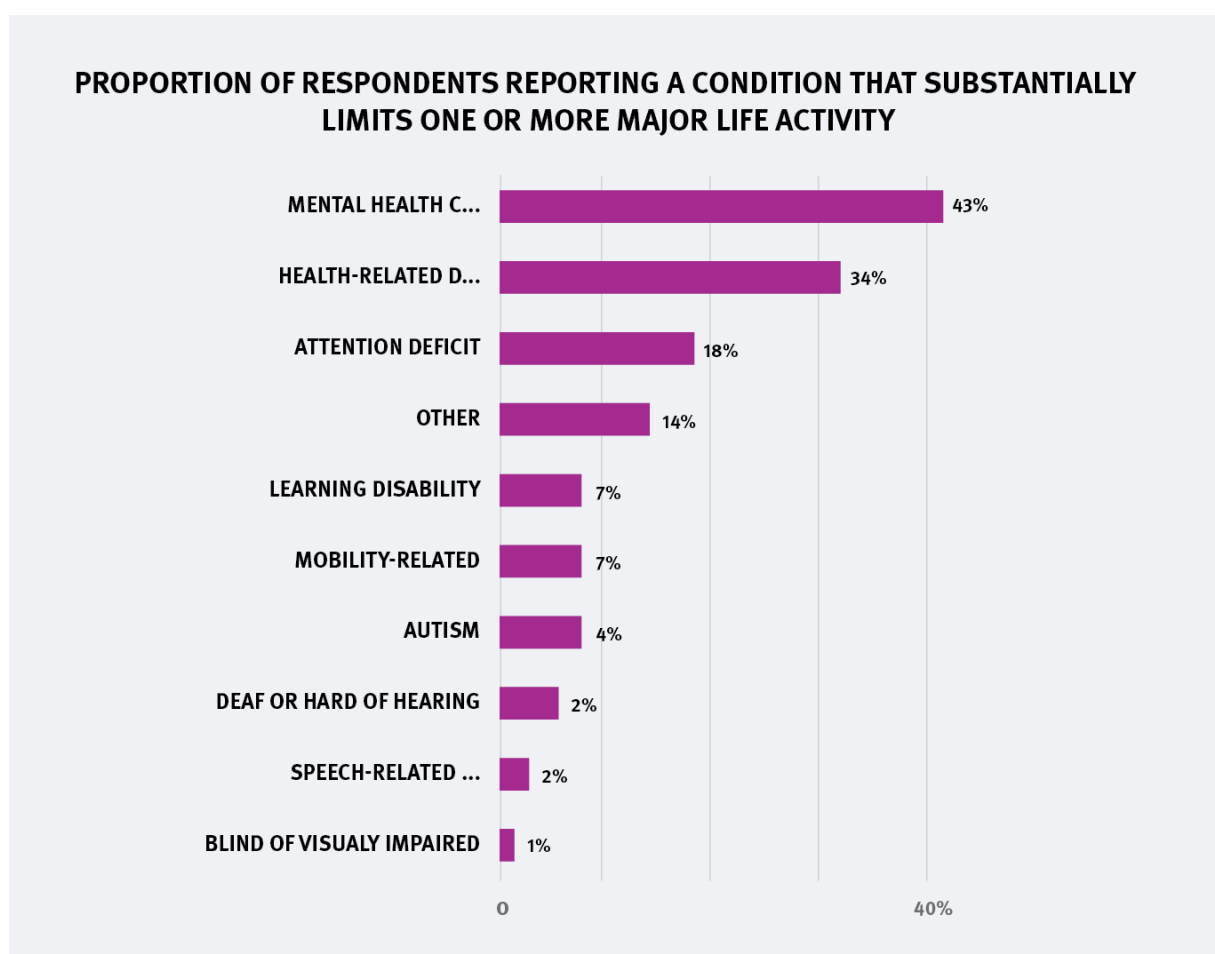
Impact of COVID-19

Black respondents' reports on outcomes related to the COVID-19 pandemic that Black people have been supported in the technology community in certain ways. In fact, Black people in industry report several significantly more positive outcomes than respondents who do not identify as Black. For example, as a result of COVID-19, more Black respondents compared to non-Black respondents report being able to grow their connections ($p < .001$, Cohen's $d = 0.52$) and industry network with influential people in their field ($p < .01$, Cohen's $d = 0.45$). In addition, Black people in are significantly more likely to report that because of COVID-19, they learned about funding and professional development ($p < .05$, Cohen's $d = 0.32$) and were able to pursue professional opportunities ($p = .01$, Cohen's $d = 0.39$); they are also more likely to report being able to contribute to their field ($p < .01$, Cohen's $d = 0.38$).

KEY FINDING 4:

TYPE OF DISABILITY INFLUENCES IMPACTS

Recognizing that the term “disability” is problematically general (Blaser & Ladner, 2020), we asked respondents whether they identify as a person with a disability or other chronic condition, providing several categories of disability. Respondents were also able to select multiple categories of disabilities. Of our respondents, 127 (9%) people self-reported at least one mental health, health-related, and/or physical disability. Because respondents could select more than one disability, percentages will not sum to 100%.



As we noted in our Survey 1 report and throughout this report, the COVID-19 pandemic is having disparate impacts on individuals in the technology ecosystem; this includes between those respondents who indicated they have disabilities and those who don't. Respondents who report at least one disability on average also report more negative impacts on their commitment to their organization, feeling that their

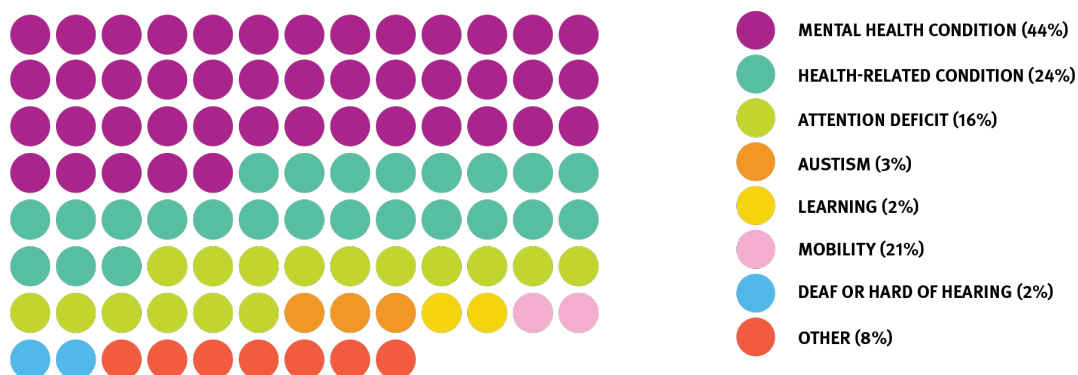
work makes a difference, feeling of belonging to the field, and their ability to persist in the field of computing compared to those not reporting a disability. Similarly, with regard to the attention to racism, respondents who report at least one disability reported more negative impacts on feeling that their work makes a difference, commitment to their organization or institution, feeling of belonging in the field of technology, and their ability to persist in the field of technology. But as Ladner et al. note, there is great variation and difference among individuals with disabilities, and looking more closely at the types of disabilities reported, can reveal important differences. We report on them here to highlight that “persons with disabilities” are not a monolithic group of individuals and that among those who reported a type of disability, there were different experiences. That said, one of our analytical limitations, similar to what other researchers experience, is that as we start to disaggregate by type of disability, the sample size decreases for each group. This is where researchers--faced with small numbers in subgroups--often decide to not report findings. We contend, however, that while the differences may not be statistically significant, it is important to not lose the nuance of varied experiences individuals with different disabilities may have. Thus, the following discussion is descriptive only, without trying to infer to a larger population using significance testing, i.e., it describes how individuals who reported one or more disabilities responded on this survey.

We encourage others to include this population and ask about type of disability in their investigations and report on their findings though the reports are descriptive-only.

COVID-19 Impacts

As we noted in our Survey 1 report and throughout this report, the COVID-19 pandemic is having disparate impacts on individuals in the technology ecosystem; this includes between those respondents who indicated they have disabilities and those who don't. Additionally, among those who reported a type of disability, there were different experiences. For example, respondents who indicated their disability or chronic condition was a mental-health condition report lower rates of feeling that their work makes a difference, commitment to their organization, ability to persist in the field and feeling of belonging to the field.

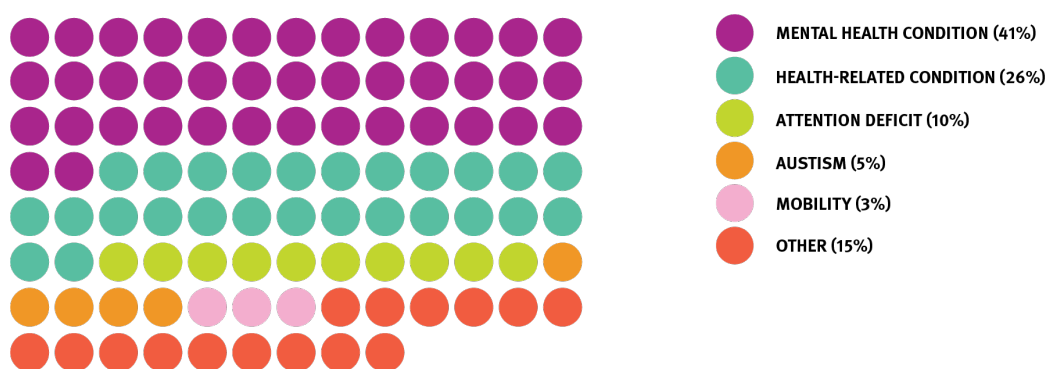
DISTRIBUTION OF THOSE WITH A DISABILITY REPORTING NEGATIVE OR VERY NEGATIVE IMPACTS ON FEELING THAT THEIR WORK MAKES A DIFFERENCE



Impacts of the Recent Attention on Racism

When we examined the data regarding the impact of the past year's racial justice movements, we saw similar patterns to those of COVID-19 and noted differences between those who reported different disability types. For example, when asked how the recent attention to racism impacted their commitment to their institution or organization, more persons with mental health conditions report negative and very negative impacts than those with other disability types. Similarly, respondents reporting attention deficits are more likely to report that the recent attention to racism has a negative impact on their ability to persist in the field of technology.

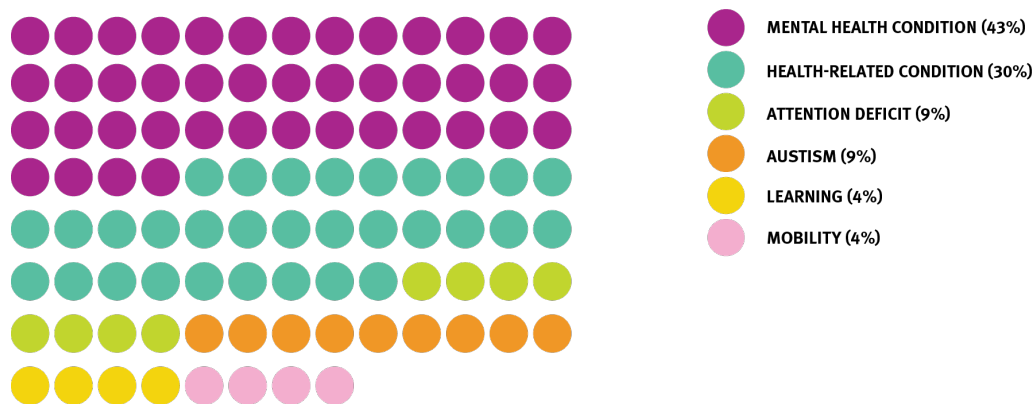
DISTRIBUTION OF THOSE WITH A DISABILITY REPORTING A NEGATIVE OR VERY NEGATIVE IMPACT ON THEIR COMMITMENT TO THEIR ORGANIZATION



When asked about their feelings about being singled out because of their race or ethnicity, those in industry with reported disabilities report feeling less singled out than student respondents.

Those reporting mental health and health-related disabilities were more likely to report a negative impact on their ability to persist in the field of technology than those reporting other disability types.

DISTRIBUTION OF THOSE WITH A DISABILITY REPORTING A NEGATIVE OR VERY NEGATIVE IMPACT ON THEIR ABILITY TO PERSIST IN THE FIELD OF TECHNOLOGY



As we describe impacts on those who reported disabilities, we should also note the intersectional identities within this group. For example, respondents reporting disabilities who also identified as Black, African American, Middle Eastern, North African, Hispanic/Latinx, Native American, Alaskan Native, First Nations, Pacific Islander, Native Hawaiian (BLNP+) report being singled out due to their race or ethnicity, observing racist behavior (including comments), more than their non-BLNP+ respondents with disabilities. We also noted that those who also identified as LGBTQIA+ report that their participation in studying and working with other students has decreased at rates greater than their non-LGBTQIA+ peers.

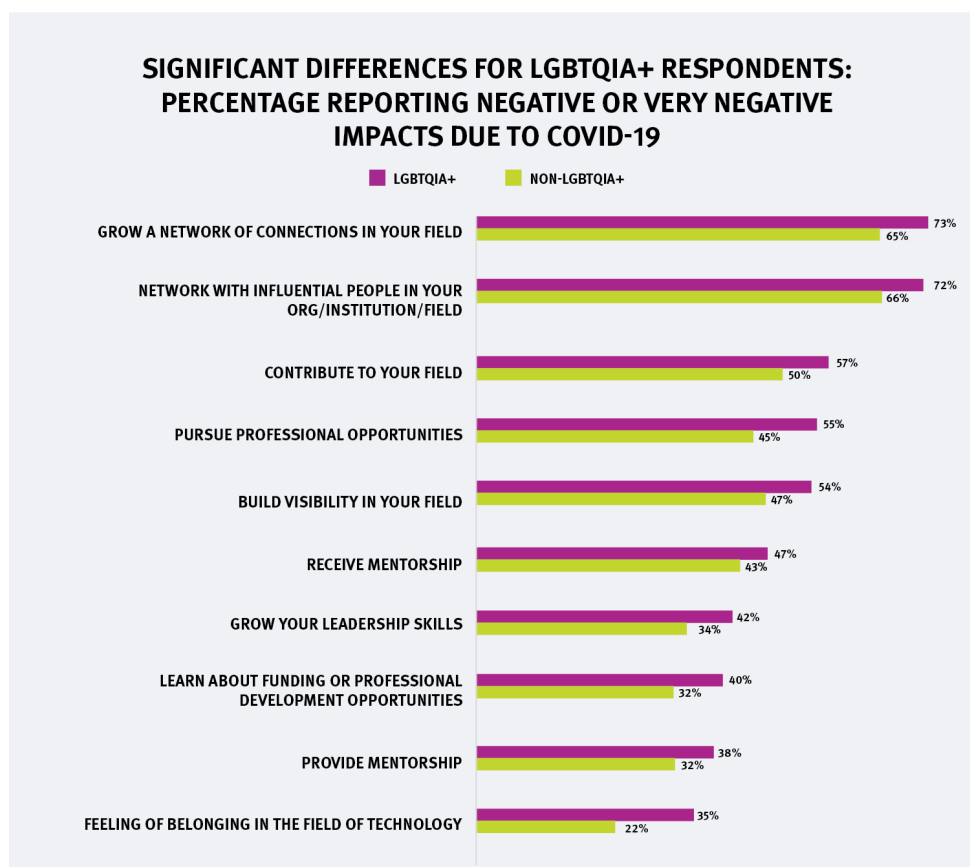
KEY FINDING 5:

WORSE OUTCOMES FOR LGBTQIA+ INDIVIDUALS

COVID Impacts on LGBTQIA+ Respondents

Respondents were asked if they consider themselves a member of the Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, and/or Asexual (LGBTQIA+) community. Of the 1,407 individuals who provided a response to this question, 16% selected “Yes,” 81% selected “No,” and 4% selected “Prefer not to answer.” For additional demographic characteristics of the LGBTQIA+ respondents, see the CIRCLE-CT Survey 2 Dashboard (bit.ly/Circle-CT). In analyzing responses by LGBTQIA+ status, we saw the LGBTQIA+ community reporting more negative outcomes than any other group we analyzed.

When asked how COVID-19 has impacted professional opportunities and experiences, networking opportunities were perceived as the most negatively impacted, with 67% of all respondents citing negative or very negative impacts to their ability to grow a network of connections in their field and 66% for ability to network with influential people in their organization, institution, or field. While networking opportunities were the most negatively impacted for LGBTQIA+ and non-LGBTQIA+ respondents, the negative impacts were significantly greater for the LGBTQIA+ group ($p < .05$).



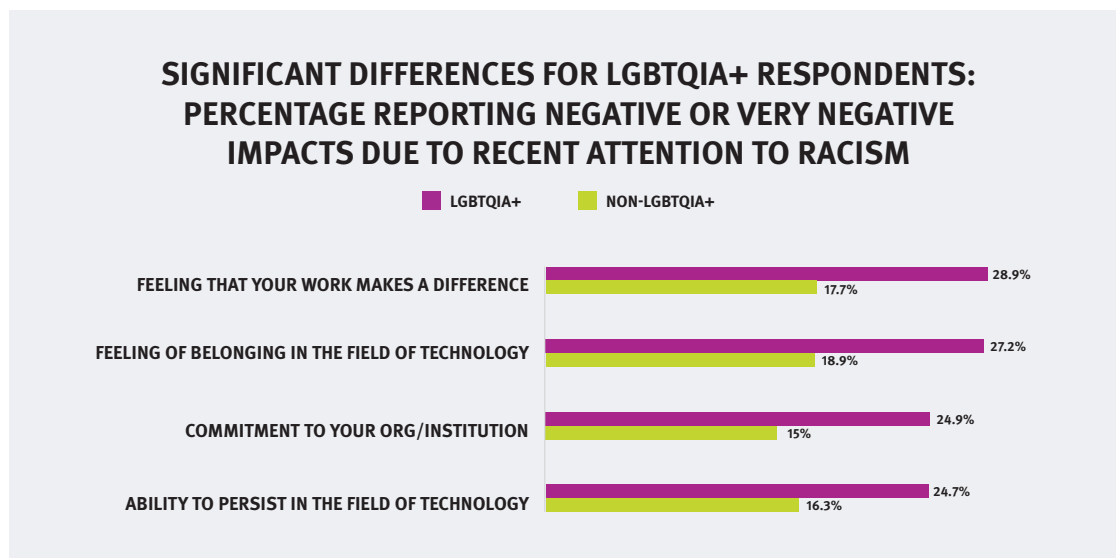
Perhaps most concerning, worse outcomes were seen for LGBTQIA+ respondents across all long-term outcome variables measured in Survey 2. On a 5-point scale from (1) very negative impact to (5) very positive impact, all means are significantly lower for LGBTQIA+ respondents when asked how COVID-19 impacted the following:

- Feeling of belonging in the field of technology (2.86 LGBTQIA+ vs 3.23 non-LGBTQIA+, $p < 0.001$)
- Ability to persist in the field of technology (2.91 LGBTQIA+ vs 3.29 non-LGBTQIA+, $p < 0.001$)
- Commitment to your organization/institution (3.01 LGBTQIA+ vs 3.36 non-LGBTQIA+, $p < 0.001$)
- Feeling that your work makes a difference (3.13 LGBTQIA+ vs 3.40 non-LGBTQIA+, $p < 0.02$)

It is important to note that for the overall sample and for the LGBTQIA+ sample, availability of professional training and development opportunities is a positive predictor for all of these outcomes ($p < 0.05$).

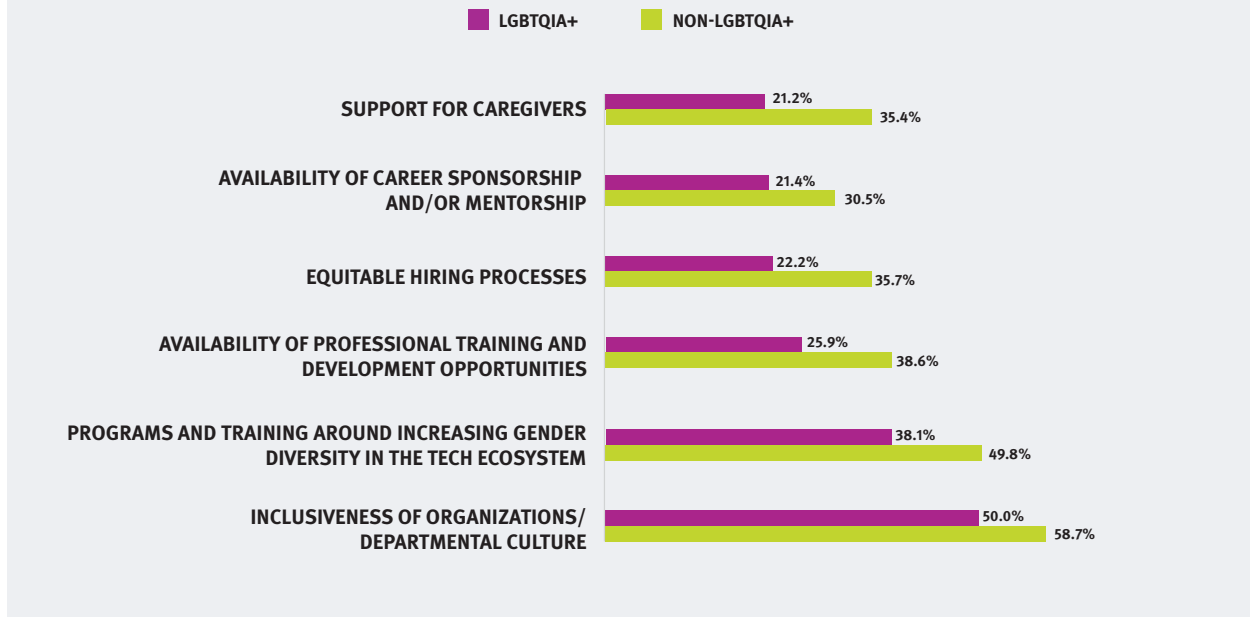
Impact of Heightened Attention to Racism & COVID-19

Respondents were also asked how the same long-term outcome variables mentioned above were impacted by the recent attention to racism. Despite almost 62% of the LGBTQIA+ sample identifying as White, LGBTQIA+ respondents have significantly lower means for all outcome variables in relation to racism. In fact, in a regression model, identifying as LGBTQIA+ is negatively linked with each of these outcome variables ($p < 0.05$), whereas identifying as BLNP+ is not a predictor for any of them.



One of our primary research questions of this study is how organizations responded to the escalating public demand for equity and justice. In Survey 2, respondents were asked how the recent attention to racism affected specific policies, programs, or practices at their organizations, universities, or schools that are related to broadening participation in technology, with a 5-point scale from (1) significantly worse to (5) significantly better. On average, respondents report that these policies, programs, or practices have gotten better, but non-LGBTQIA+ respondents have significantly higher means than their LGBTQIA+ counterparts ($p < 0.05$).

SIGNIFICANT DIFFERENCES FOR LGBTQIA+ RESPONDENTS: PERCENTAGE REPORTING BETTER OR SIGNIFICANTLY BETTER CHANGES DUE TO RECENT ATTENTION TO RACISM



For LGBTQIA+ respondents, programs and training around increasing racial and ethnic diversity in the tech ecosystem is positively linked ($p < .05$) with commitment to their organization, ability to persist in the field of technology, and feeling of belonging in the field of technology. Inclusiveness of organizational or departmental culture is also a positive predictor ($p < .02$) of feeling of belonging in the field of tech.

Although the data paint a clear picture that the LGBTQIA+ community is experiencing more negative impacts, it is unclear from our existing data as to why this might be. In the third CIRCLE-CT survey, as well as in follow-up interviews, we plan to learn more about the specific factors contributing to the LGBTQIA+ community's differential experiences.

NEXT STEPS

In the coming months, we will launch the third and final survey of this project. Coming a year after the first survey, the content will include, among other things, retrospective and anticipated impacts (career, personal, organization, DEI) of the dual pandemics of COVID-19 and racism. We will also be conducting a set of interviews to flesh out the differing experiences of individuals in the technology community, from K-12 educators to university professors and their students, to technologists working in large and small companies. From our first two surveys, we know that the dual pandemics of COVID-19 and racism are being experienced differently by different populations. These interviews will provide richer views into how the effects of these pandemics are differentially distributed depending on one's career level, place in the technology ecosystem (e.g., academia versus industry), family situation (e.g., parenting small children), and one's demographic characteristics such as sexuality, disability status, race/ethnicity, and gender.

METHODOLOGY

SURVEY INSTRUMENT AND ADMINISTRATION

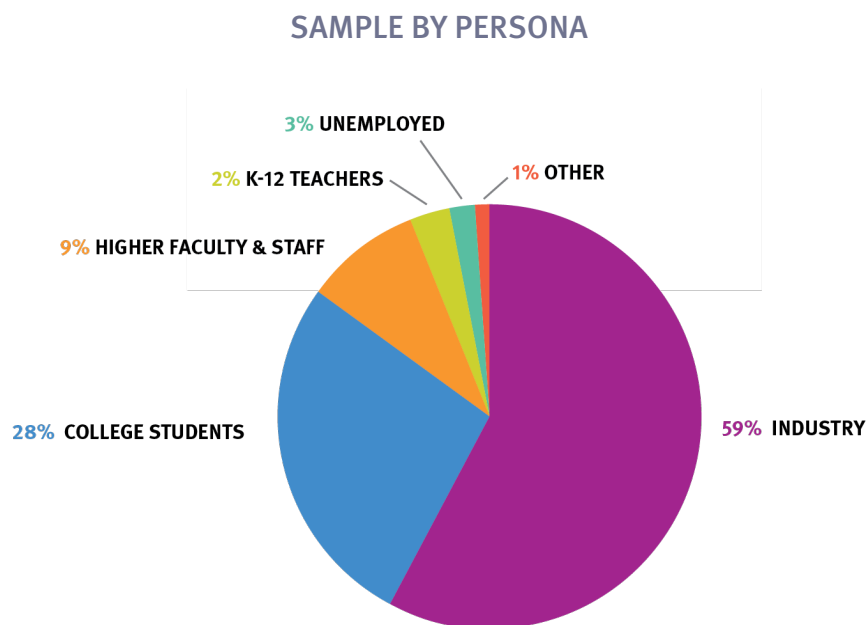
The 40-item survey included three sections: Participant Demographics, Impact of COVID-19, and Response to and Impact of Increased Attention to Racism. Respondents were recruited through multiple channels including direct email invitations to individuals on the mailing lists of the partner organizations (NCWIT, AnitaB.org, STARS), push notifications during AnitaB.org's virtual Grace Hopper Celebration in October 2020, and partner newsletters and social media. The messages stated that we were interested in "gathering responses from individuals across the computing and technical ecosystem." Potential respondents were encouraged to share the survey invitation with their networks. The survey was administered online via Qualtrics and was open for responses from September 30 through November 2, 2020. Three thousand, one hundred and twenty-two (3,122) individuals responded to the survey. Respondents were able to select which questions they answered, none were required, so there are varying numbers of people who answered each question in our analysis.

PERSONA

Respondents were asked to designate their current occupational or educational status and were assigned a Persona based on their response to this question. Of the respondents who answered this question (n=2,124), the majority (n=1,241, 58%) were individuals working in industry, which includes those working at a for-profit company, non-profit, nongovernmental organization (NGO), or government agency, as well as start-up founders, and those that are self-employed. Because of the low response rate for K-12 teachers and

unemployed individuals, we did not do separate analyses for these groups. However, they are included in analyses conducted on the entire sample.

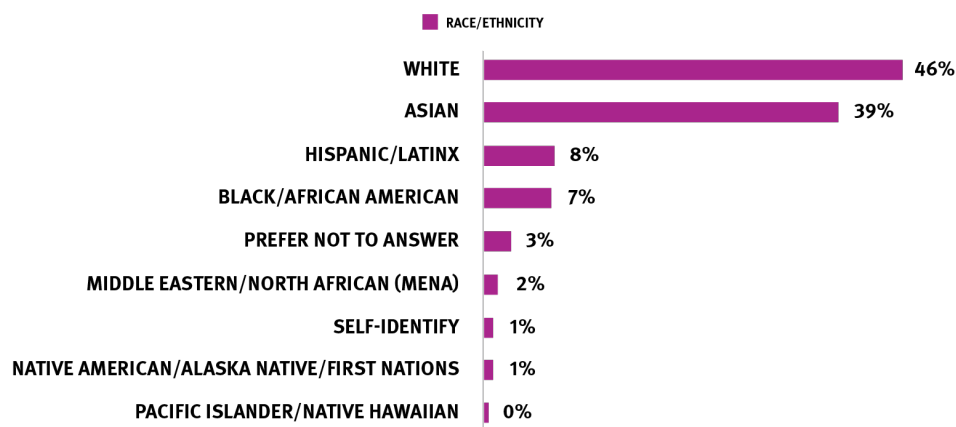
Questions were analyzed for significant differences based on Persona, and further analyses controlled for Persona when looking at other identity-based differences such as gender or race/ethnicity.



RACE AND ETHNICITY

Respondents were asked to report their race and ethnicity according to the following categories: Asian, Black/African-American, Hispanic/Latinx, Middle Eastern/North African (MENA), Native American/Alaska Native/First Nations, Pacific Islander/Native Hawaiian, White, Prefer not to answer, or Self-Identify (open-ended). Multiple identities could be chosen, and 7% (n=96) of respondents selected two or more race/ethnicities. Of respondents who selected only one race/ethnicity, 41% were white, 36% were Asian, 6% were Black, 5% were Latinx, 1% were MENA, and 0.2% were Native American. There were no respondents selecting Pacific Islander as their only race/ethnicity. Statistical analysis tests were run individually for racial/ethnic groups to measure differences in responses to the survey items. These analyses were done only for Asian, Black, Latinx, and White groups, as the sample size was too small for analyses on other discrete racial/ethnic groups.

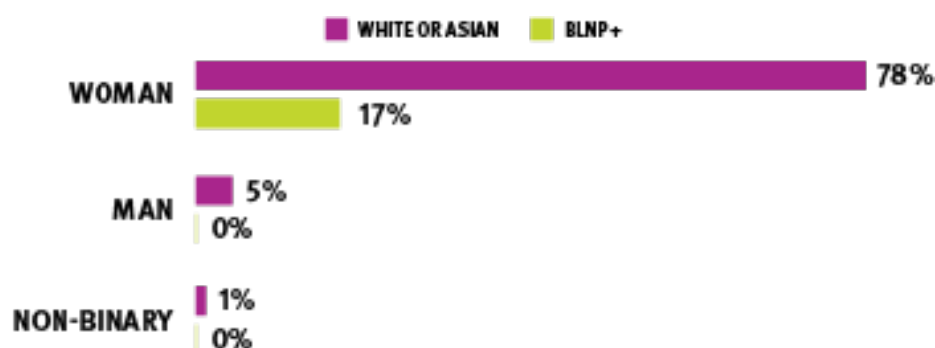
SAMPLE BY RACE/ETHNICITY



GENDER

Respondents were asked to report their gender with the following response categories provided: Woman, Man, Nonbinary, Prefer not to answer, or Prefer to describe (open-ended). Of the 1,420 individuals who provided gender information, 92% (n=1,306) reported their gender as woman and 5% (n=70) as man, and 2% (n=22) as non-binary. When looking at the intersection of gender and race/ethnicity, the majority of respondents were White women (41%) or Asian women (38%), with Black women and Latinx women making up the next two largest groups, both at 7%. Analysis based on gender was limited due to the small response rate from men and non-binary individuals. Respondents who selected “prefer not to answer” were excluded from all gender analyses.

SAMPLE BY INTERSECTIONAL GENDER & RACE/ETHNICITY



LGBTQIA+

Respondents were asked whether they consider themselves “a member of the Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, and/or Asexual (LGBTQIA+) community.” Responses were: Yes, No, or Prefer not to answer. Of the 1,407 individuals who responded to this question, 16% selected “Yes,” 81% selected “No,” and 4% chose “Prefer not to answer.” Questions were analyzed for significant differences between respondents who selected “Yes” and those who selected “No.” Those who selected “Prefer not to answer” were excluded from LGBTQIA+ analyses.

DISABILITIES

Respondents were asked if they “identify as a person with a disability or other chronic condition.” Of the 1,411 individuals who answered this question, 88% selected “No,” 9% selected “Yes,” and 3% selected “Prefer not to answer.” Multiple disability types were presented, and respondents were able to select more than one type. Questions were analyzed for significant differences between respondents who selected “Yes” and those who selected “No.” Those who selected “Prefer not to answer” were excluded from disabilities analyses. Descriptive analysis was also done within respondents who selected “Yes” to understand experiences within the community.

SAMPLE LIMITATIONS

Survey 2, while open to anyone in the technology community and advertised through all three organizations, ended up including a majority of respondents drawn from the pool of the 2020 AnitaB.org Grace Hopper Celebration attendees. Thus, there were both fewer K-12 teachers and fewer men in the sample than in Survey 1.

As a self-selected sample of individuals recruited primarily from the networks of the three sponsor organizations, this sample is likely dominated by individuals who support broadening participation in technology initiatives, or whose organizations do. Women are also overrepresented in the sample compared to their current participation in computing.

ANALYSIS BY GROUPED IDENTITIES

Respondents were grouped to compare experiences based on these grouped identities. T-tests were conducted on questions for the following groups; these analyses were performed on the overall sample and also while controlling for Persona:

| | Included in Group 1 | Included in Group 2 |
|---|--|--------------------------------------|
| Gender | Women, Nonbinary | Men |
| BLNP+ | Black, African American, Middle Eastern, North African, Hispanic/Latinx, Native American, Alaskan Native, First Nations, Pacific Islander, Native Hawaiian | White, Asian |
| BLNP+ Women & Nonbinary | BLNP+ Women, BLNP+ Nonbinary | Men, White, Asian |
| Underrepresented in Technology (URT) | Women, Nonbinary, BLNP+ Men | White Men, Asian Men |
| LGBTQIA+ | Members of the LGBTQIA community | Non-members of the LGBTQIA community |

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