

**A cross-national, cross-sectional study of women's retention and advancement in Information Technology (IT) and Engineering careers – Sweden Report**

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## Key Findings

- Survey respondents mostly identify as woman (vs. trans or non-binary), between the ages of 30 and 39 years old, are married/cohabiting, heterosexual, and educated with a doctorate degree.
- Over one-half of respondents were not born in Sweden – allowing for comparisons between Sweden as the country of origin versus not Sweden as the country of birth.
- Slightly more respondents work within computer sciences or information technology (CSIT) than engineering (54.7% vs. 45.3%). The vast majority work in the academic sector (90.7%) and are employed in a limited term position. Due to the low number of respondents working in the public or private sector – we were unable to conduct various cross-sector comparisons.
- Overall, CSIT respondents are more satisfied by their careers than engineering respondents and participants born in Sweden are more satisfied by their careers compared to respondents born elsewhere.
- In terms of workplace alienation, CSIT respondents have below average workplace alienation overall, and for the powerlessness and self-estrangement sub-indices. By contrast, engineering respondents were less likely to experience alienation in the form of the meaninglessness sub-index. Sweden-born respondents have below average workplace alienation across all measures, whereas respondents born elsewhere have above average workplace alienation.
- One-in-three respondents indicate plans to change jobs in the next two years. There appears to be greater retention in engineering compared to CSIT, and more turnover intention among respondents born outside of Sweden. Primary reasons for turnover intention are job-related due to not having a permanent position (e.g., limited term position/contract ending), and other job-related factors including dissatisfaction with salary, few promotion opportunities, working hours, and/or hostile climate.
- Workplaces with effective leadership/management and supportive colleagues are highlighted as factors supporting job retention. Work autonomy can also support job retention.
- Most respondents experience some emotional exhaustion. Overall, engineering respondents are more likely to feel emotionally exhausted across all individual measures than CSIT respondents. Sweden-born respondents are also more likely to report ‘feeling used up at the end of the workday’ compared to respondents born outside of Sweden.
- Respondents perceive gender equity within their workplaces for career development opportunities, salaries, recognition, and decision-making. However, one-third of respondents perceive women as more likely to have others take credit for their work. Interestingly, when examining perceptions of workplace gender equity, Sweden-born respondents are more pessimistic than respondents born in other countries.
- Nearly three-quarters of respondents indicate that they are personally impacted by gender-stereotyping within the workplace. Overall, CSIT respondents perceive more workplace gender stereotyping compared to engineering respondents.
- Respondents mostly perceive their workplaces to be supportive and inclusive. However, many respondents indicate having their opinions ignored; having difficulty fitting in compared to colleagues/coworkers; feeling like an outsider; and having to work harder than men to be viewed as legitimate. CSIT respondents have above average workplace exclusion

and lack of support compared to engineering respondents. In addition, respondents who experience workplace exclusion or lack of support were less satisfied by their careers and experience more workplace alienation.

- Three-quarters of respondents indicate that they have experienced at least one incident of workplace hostility or negative experiences. Subtle and indirect forms of exclusion, microaggressions, discrimination and harassment are more common. While intentional forms of harassment such as intimidating behaviours are less common, they do continue to occur.
- Despite the occurrence of exclusion, microaggressions, discrimination and harassment, the overall formal reporting of these incidents remains low. Respondents are more likely to report direct and intentional forms of harassment/discrimination such as intimidating behaviours, insults/remarks, or formal exclusion. Moreover, while the overall likelihood of formal reporting is low, Sweden-born respondents were nearly twice as likely to report incidents compared to respondents born elsewhere. The inability to maintain anonymity during the reporting process was highlighted as one reason respondents do not report.
- Respondents who experience sexual harassment at work are more likely to experience workplace alienation compared to respondents who have not experienced these incidents.
- Sweden-born respondents indicate more work-life interference compared to respondents born elsewhere. CSIT respondents also experience more work-life interference compared to engineering respondents. Respondents who experience work-life interference have above average emotional exhaustion.
- Most respondents report having as much access to formal and informal networking opportunities within their workplaces as their male colleagues/co-workers. However, these networks remain gendered and primarily composed of men.
- Most respondents perceive that gender bias remains prevalent within STEM-based careers in Sweden and they continue to perceive gender inequality within EICT.
- Respondents believe that there should be increases to government benefits and subsidies, especially for study allowance, student grants, student loans, sickness benefits, and unemployment benefits.

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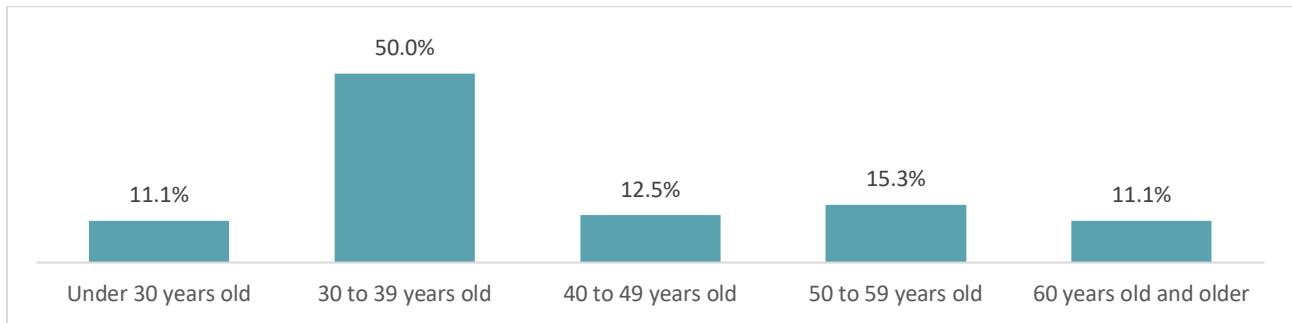
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### Sample Size and Description

A total of 75 individuals responded to the cross-national, cross-sectional study of women's retention and advancement in information technology and engineering careers survey. Figure 1 depicts the age distribution of respondents. Notably, one-half of respondents are between the ages of 30 to 39 years old. The majority report being married/cohabiting with a partner (63.9%).

*Figure 1: Age distribution of respondents*



The survey was administered to respondents employed in engineering and information and communications technology (EICT). There are slightly more respondents working in CSIT than those working in engineering (54.7% vs. 45.3%). Most respondents work in the academic sector (90.7%). The remaining work in the public or private sector (9.3%). Due to the low number of respondents working in the public or private sector – we were unable to conduct many cross-sector comparisons. Herein we use the term ‘work area’ when comparing engineering respondents to computer sciences or information technology (CSIT) respondents. Where applicable, we also use the term non-academic to designate respondents working in the public or private sectors.

For respondents working in the academic sector, most are employed within a limited term position (e.g., lecturer, technician, postdoctoral fellow (PDF), or Ph.D. students), followed by full professor, associate professor, assistant professor, other positions, and teaching-focused instructors (see Figure 2).

Figure 2: Academic Rank (Academic Respondents Only)

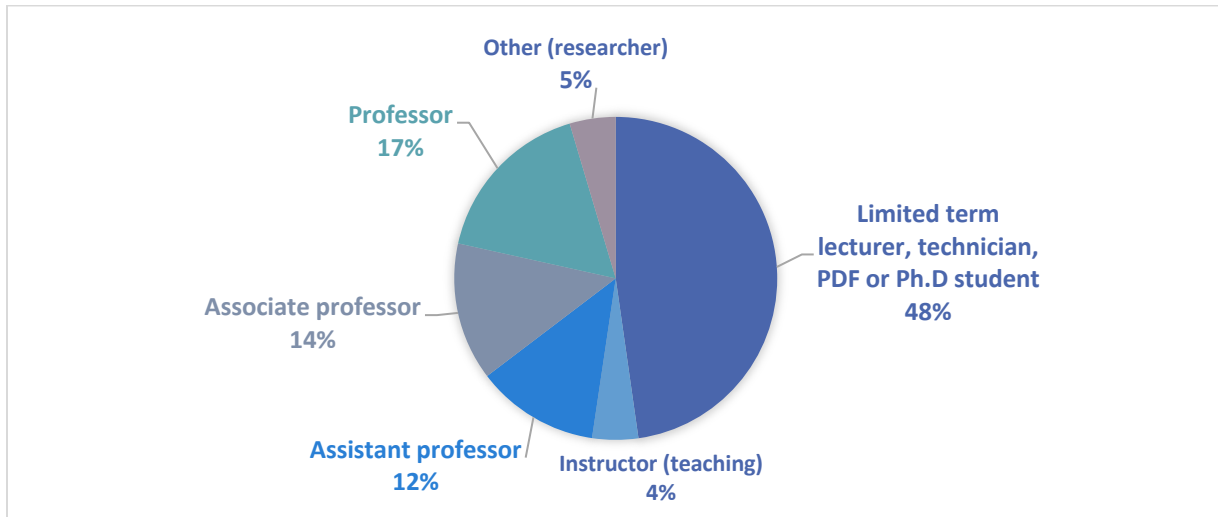


Table 1 depicts the size of the communities in which respondents live within Sweden. More respondents working in CSIT reported living in an urban area compared to engineering respondents (46.3% vs. 35.5%). By contrast, more engineering respondents reported living in a suburban area (38.7%) and small town/rural area (25.8%) compared to CSIT respondents (34.1% and 19.5%, respectively).

Many survey respondents indicated not being born in Sweden (57.1%) compared to Sweden-born (42.9%). Of all CSIT respondents, 59% indicated not being born in Sweden. Of all engineering respondents, 54.8% reported not being born in Sweden.

Table 1: Respondent by Regions in Sweden

REGION DESCRIPTION	PERCENT
STOCKHOLM/GOTHENBURG/MALMÖ/LUND AREA	41.7%
MIDDLE SIZED TOWN (50,000 INHABITANTS OR MORE)	36.1%
SMALL TOWN/RURAL AREA (UP TO 50,000 INHABITANTS)	22.2%
<b>TOTAL</b>	<b>100%</b>

In terms of education, most survey respondents reported a doctorate degree (57.7%), followed by master's degree (38%), and bachelor's or less (4.2%).

On average, respondents indicated a personal annual income (before taxes) of kr571,775 (SD = kr214,567; Md = kr534,622). Overall, more engineering respondents indicated being the primary income earner in their household compared to CSIT respondents (86.7% vs. 64.1%). More than

half of the respondents indicate being in a dual-income household (55.1%), followed by single-income household (31.9%), or cohabiting with single or partially single income (13%).

When examining family dynamics, more than one-half of respondents indicate that they do not have any children (54.9%). Of those with children, most reported having two children (25.4%), followed by one child (12.7%), then three or more children (7%). Of respondents with child(ren), 15.6% report having child(ren) under 2 years of age; 43.8% indicate having child(ren) under 5 years old; and 81.3% indicate having child(ren) under 16 years old.

The majority report having taken maternity/parental/adoptive leave for at least one child (90.6%). As well, over three quarters of respondents indicated that their spouse/partner also took maternity/parental/adoptive leave (71.9%) for at least one child. By contrast, fewer than one-fifth of respondents indicate that only one parent (the respondent) took maternity/parental/adoptive leave for their child(ren) (18.8%). Only 6.3% indicated that neither parent took maternity/parental/adoptive leave. Nearly all respondents reporting not taking a leave were born outside of Sweden.

Respondents indicate a variety of childcare options utilized. Overall, most respondents utilize daycare services (43.3%), followed by family and/or friends providing care (20%), before/after school programs (16.7%), and partner/spouse providing childcare (13.3%).

### Employment History and Tenure

Most respondents indicate being in their current job position for between one to four years (30.8%) or between five to nine years (30.8%). One-fifth of respondents have been at their current job position for less than one year (20.5%), and the remaining respondents have been working in their current position for 10 years or longer (17.9%). Overall, an equal percentage of respondents are in their early career of less than five years in EICT (42.9%), mid-career of 5 to 20 years (42.9%), and the remaining are in their late career of over 20 years in the EICT (14.3%).

Regarding job stability, 55.6% of respondents have continuing appointments and/or a full-time permanent position, while the remaining 44.4% report that they do not.

In terms of leadership positions, one-fifth (20%) of respondents indicate being in an administrative (academic) or management-level position. However, nearly two-thirds (63.2%) indicate interest in advancing higher to a management or administrative position. There were some differences in interest in advancing to a higher position across work areas. Specifically, a greater proportion of engineering respondents reported interest in advancing to an administrative or management position than CSIT respondents (73.9% vs. 55.9%).

### Working Hours

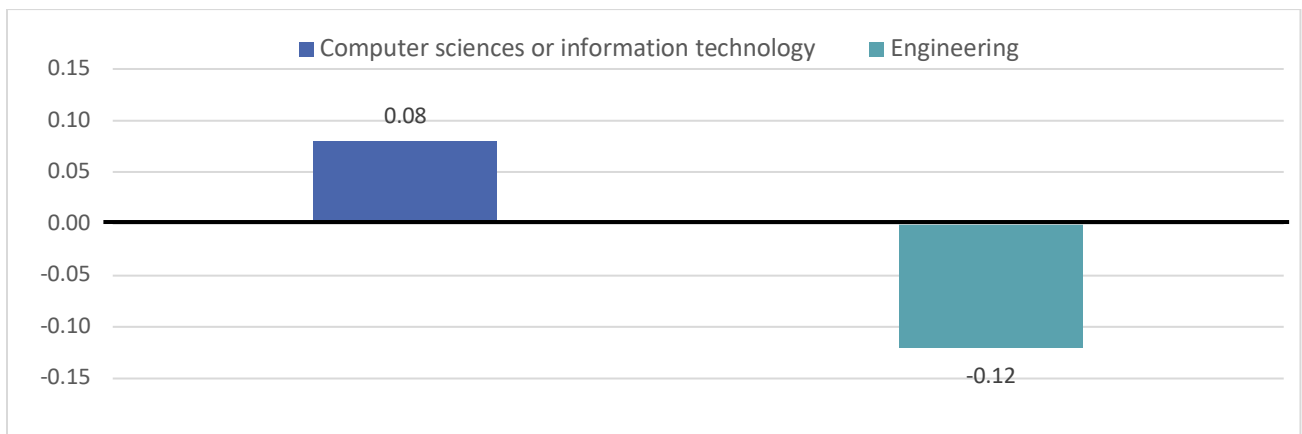
Respondents were asked how many paid hours they work in a typical week at their current place of employment. Most respondents indicated working hours between 40 to 49 hours per week

(72.2%). However, 11.1% report working 50 hours or more per week, and 16.7% of the sample indicated working fewer than 40 hours per week.

### Workplace Flexibility and Flexible Working Arrangements

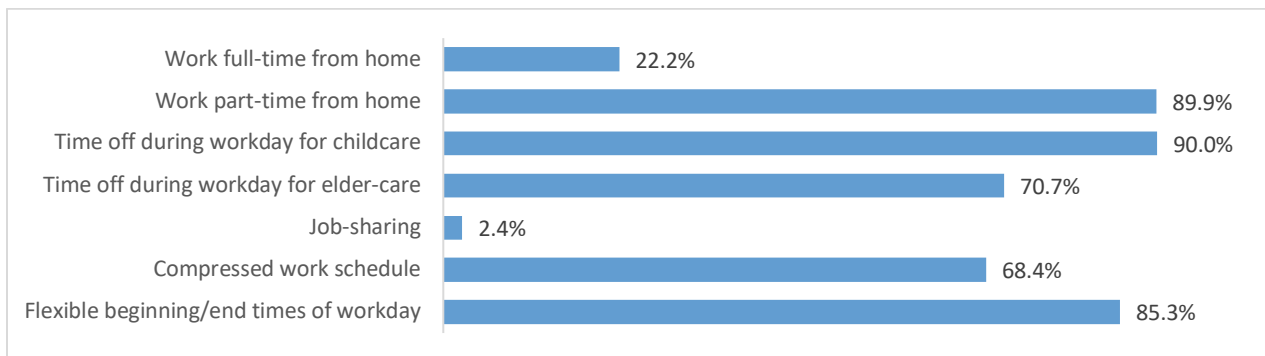
Respondents were asked about the flexible work arrangements available to them (pre-COVID-19 and during the COVID-19 pandemic). An Index was computed to analyze overall workplace flexibility. Index scores were standardized so that groups could be compared to a mean (M) of zero. As shown in Figure 3, respondents working in CSIT (M = .08, SD = .94) recorded a positive score on the Index - representing above average workplace flexible options available to them. By contrast, engineering respondents (M = -.12, SD = 1.09) recorded a negative score representing below average options for workplace flexibility.

Figure 3: Workplace Flexibility Options Index



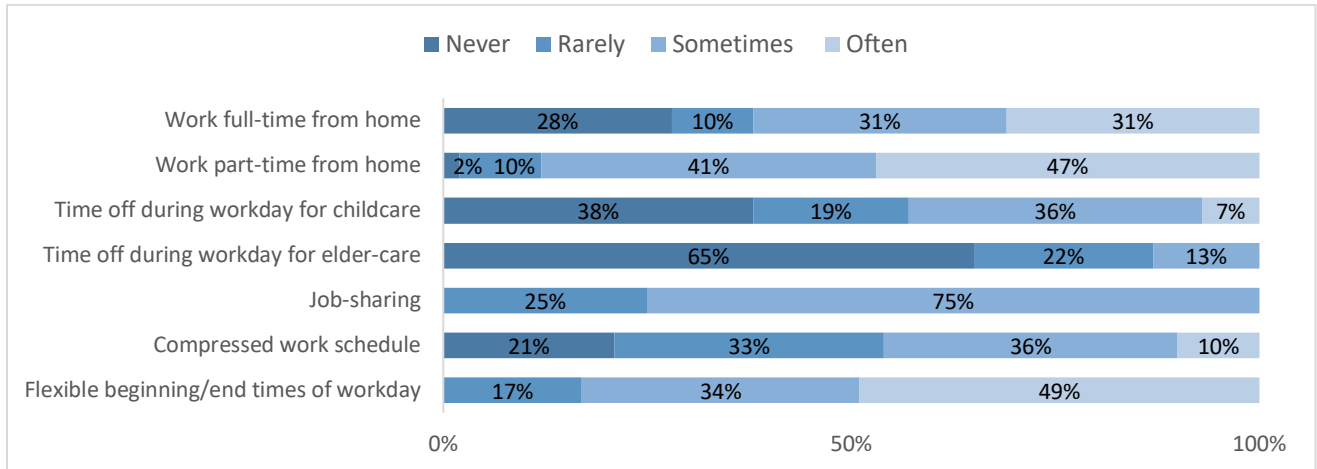
To explore this further, Figure 4 depicts various types of flexible work arrangements available to respondents. The most popular flexible work arrangement offered by employers is the option to take time off during workday for childcare (90%), work part-time from home (89.9%), flexible work start and end times (85.3%), and taking time off during work for older adult care (70.7%).

Figure 4: Workplace Flexibility Options Offered by Employers



In terms of frequency of using flexible work options (see Figure 5) - most respondents with flexible work start and end times indicate using this option *often* (49.2%) or *sometimes* (33.9%). Similarly, respondents who have the option to work part-time from home indicate using this option either *often* (47.6%) or *sometimes* (41.3%). In addition, one-third of respondents with the option to work a compressed schedule (e.g., four ten-hour days) – report using this option *sometimes* (35.7%).

Figure 5: Frequency of Use - Workplace Flexibility Options Offered by Employers



### Workplace Leave of Absence

Nearly two-thirds of survey respondents indicated having taken a leave of absence for non-sabbatical or research purposes (61.1%). When examining reasons, 45.8% of respondents reported that they have taken parental leave. Other reasons include short-term sick leave (18.1%), caregiving leave (47.2%), long-term sick leave (9.7%), and/or disability leave (27.8%).<sup>1</sup>

### Adult Caregiver Experience

Overall, 8.7% report that they were formerly or currently a caregiver of an adult (e.g., elderly parent). The remaining 91.3% indicated that they have never been a caregiver/guardian for an older adult.

### Perceptions on Career Trajectory, Advancement, and Career Satisfaction

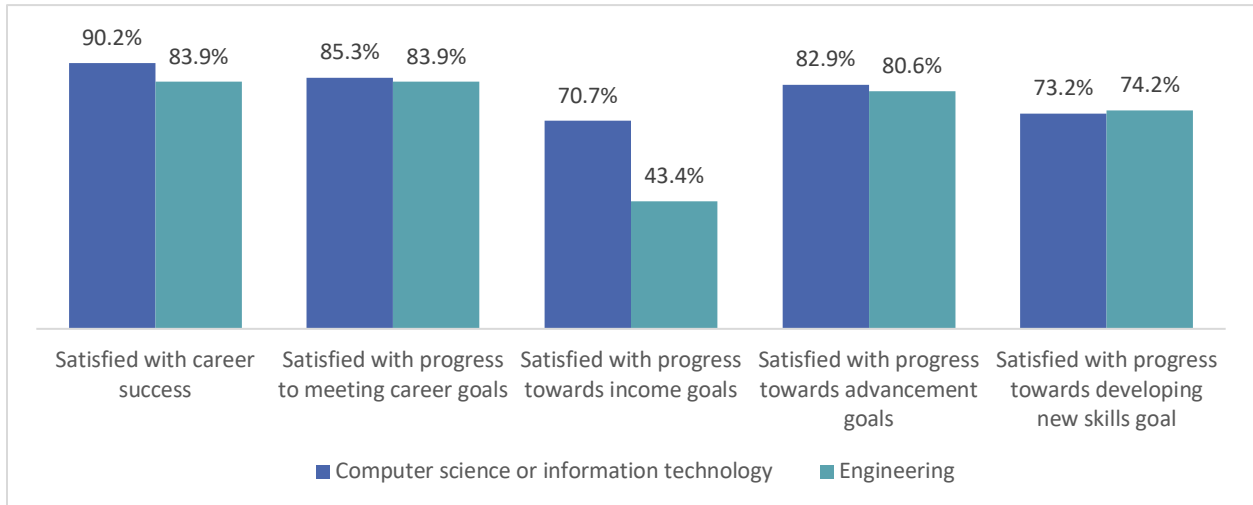
Overall, 59.4% of respondents report perceiving themselves to be on track (average advancement), 30.4% report being behind the typical promotion/advancement track, and 10.1% perceive themselves to be ahead.<sup>2</sup> As depicted in Figure 6, there were similar perceptions of career satisfaction between engineering and CSIT respondents. However, there was more disparity over satisfaction with income goals. More specifically, CSIT respondents were more

<sup>1</sup> Totals exceed 100% due to respondents with multiple leave of absences.

<sup>2</sup> Totals do not reach 100% due to rounding.

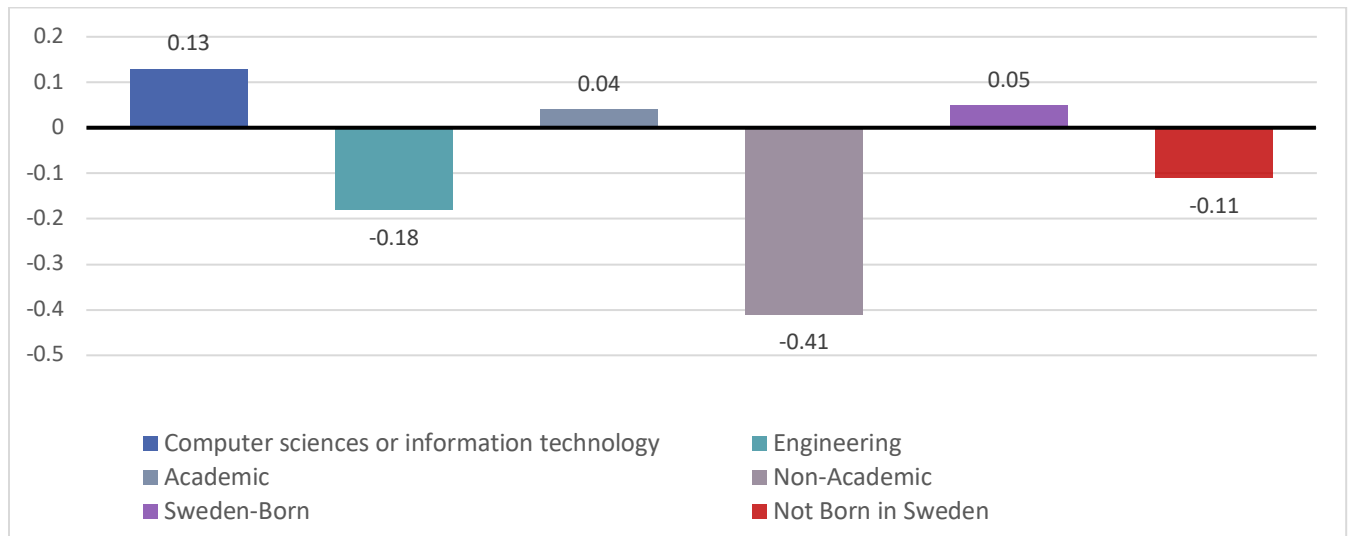
likely to agree to this statement compared to engineering respondents by over 27 percentage points.

Figure 6: Perceptions on Career Satisfaction



Based on the individual items, an overall Career Satisfaction Index was computed to compare the experiences of respondents to a mean (M) of zero. Negative scores represent below average career satisfaction, and positive scores indicate above average career satisfaction. As illustrated in Figure 7, CSIT respondents recorded the highest positive score (M = .13, SD = 1.09) for career satisfaction followed by respondents born in Sweden (M = .05, SD = 1.19). By contrast, respondents working in the non-academic sector recorded the lowest score (M = -.41, SD = .48). This indicates that overall CSIT respondents (M = .13, SD = 1.09) are more satisfied with their careers than engineering respondents (M = -.18, SD = 0.86); and academic respondents (M = 0.04; SD = 1.03) are more satisfied with their careers than non-academic respondents. Moreover, respondents born in Sweden are more satisfied with their careers compared to respondents born elsewhere (M = -.11, SD = 0.81).

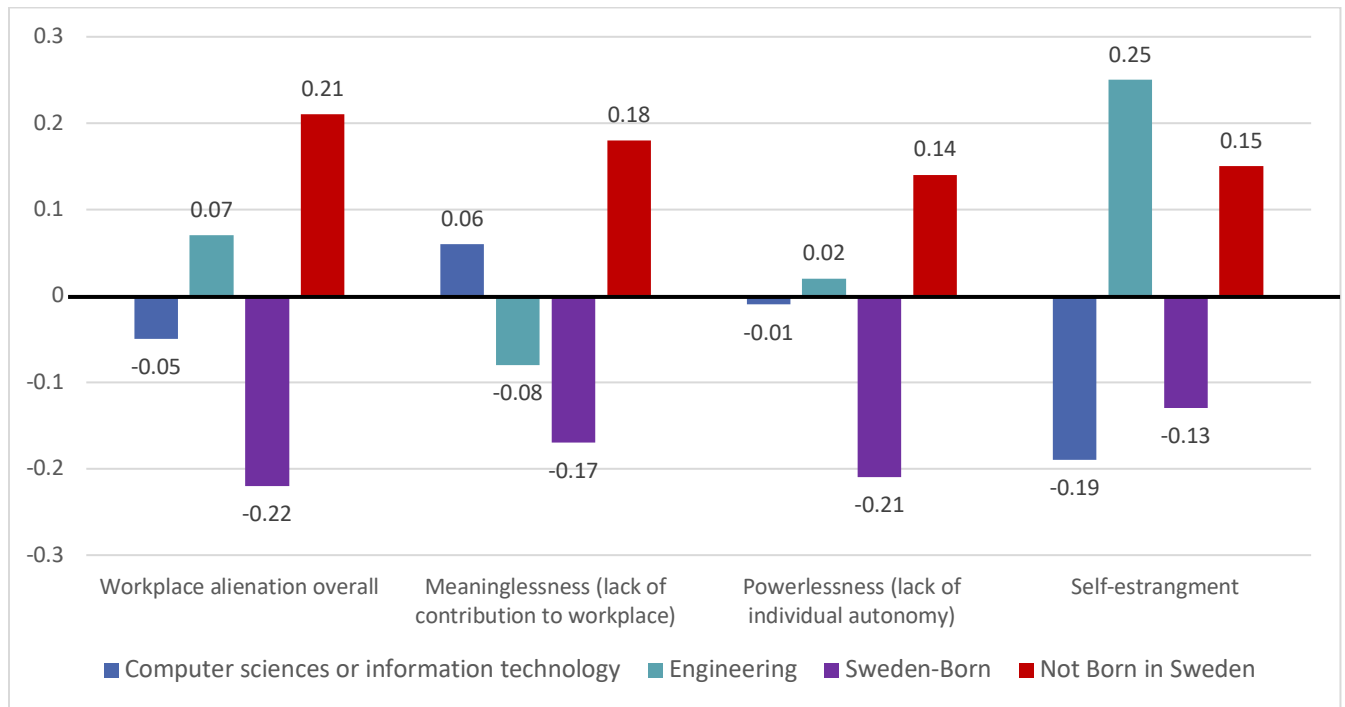
Figure 7: Career Satisfaction Index



### Workplace Alienation

Respondents were asked a series of questions about workplace alienation. Measures included feelings of meaninglessness (lack of contribution to the workplace), powerlessness (lack of individual autonomy), and self-estrangement (lack of connection to others, society and humanity; first defined by Karl Marx – German: Entfremdung). A Workplace Alienation Index was calculated with negative scores representing below average workplace alienation and positive scores indicating above average workplace alienation. As illustrated in Figure 8, CSIT respondents recorded negative scores for three measures, which include overall perceived workplace alienation ( $M = -.05$ ,  $SD = .97$ ), powerlessness ( $M = -.01$ ,  $SD = 1.00$ ), and self-estrangement ( $M = -.19$ ,  $SD = .94$ ). This indicates that CSIT respondents have below average levels of overall workplace alienation, powerlessness, and self-estrangement. By contrast, engineering respondents were less likely to experience meaninglessness ( $M = -.08$ ,  $SD = .87$ ). Respondents born in Sweden reported below average levels of workplace alienation across all measures whereas respondents born outside of Sweden recorded high scores. This reveals that respondents born outside of Sweden have above average workplace alienation.

Figure 8: Workplace Alienation Index



### Future Job Attrition

Respondents were asked if they plan to change jobs in the next two years (not including retirement). Overall, 33.3% of survey respondents plan to change jobs. A closer look reveals that more CSIT (38.9%) respondents have plans to change jobs in the next two years compared to those working in engineering (25.9%). There were notable differences in turnover intentions for Sweden-born (23.1%) compared to non-Sweden born (41.7%) respondents.

Respondents who indicated they were planning to change jobs in the next two years were asked a series of follow-up questions to enhance understanding regarding their motivations for job change. Of these respondents (n=21), 67% reported only one reason for considering a job change. The remaining 33% reported two or more reasons. The most reported reason for job change is a lack of tenure or permanent position. Specifically, 60% of these respondents indicated intention to change jobs because their position will be ending (e.g., temporary position, limited-term position, or contract). Other motivations for job-change include job-related factors (23.3%) (e.g., dissatisfaction with salary, few promotion opportunities or hostile climate), personal reasons (e.g., no longer interested in work and want a change) (13.3%), and family-related reasons (e.g., relocating for spouse/partner's job or to be closer to elderly parents, or to provide childcare) (3.3%).

Below are excerpts of open-ended comments from respondents who reported an intention to leave their position due to their Ph.D. position ending, and not wanting to remain in academia:

*The clear reason for changing my current employment is that I am about to defend my Ph.D. thesis. In general, I am not satisfied with the academic working environment and I have faced problems in industry as one of very few women. (Academic).*

*My Ph.D. position will end, and I am not planning to stay in academia due to the work climate there, e.g., (sexual) harassment. (Academic).*

*Tired of academia in general (I've been in 4 universities/institutes in 3 countries, it's the same everywhere). Toxic working environment; Underpaid work; Not always good working conditions; Not many opportunities for career evolution; Authority related behaviours especially from the side of people belong to high level positions; Not gender equality approach; Hopefully I will finish my Ph.D. (Academic).*

*...The university is not a great working place, so I am thinking of moving. (Academic).*

Similarly, other comments highlight negative workplace climates and poor leadership:

*I don't think the people in my research group act in a moral and ethical manner. We don't have a good group climate. Our boss takes no responsibility and doesn't know how to solve problems. In conclusion I don't feel happy with the people I work with. (Academic).*

*The lack of possibilities to increase my salary (which is depending on my first salary as a student on another position at the same organisation), Weak leadership (or without the feeling [of] continuity). (Non-academic).*

Open-ended comments also shed light onto job retention. In several cases, positive workplaces and supportive colleagues were highlighted as main reasons for not changing jobs:

*I like it, both the tasks and the workplace with colleagues etc. It constantly evolves and challenges me. (Academic).*

*I like to teach at a university, and I have a group of colleagues that make me enjoy coming to work every day. (Academic).*

Respondents also indicate work autonomy and work impact as factors supporting their job retention:

*Because I am genuinely interested in research and education, and it is a professional role where I feel that my skills and my personality fits. (Academic).*

*Flexible, lots of different opportunities, I get to learn so much new stuff all the time. (Academic).*

*Freedom of expression, mode of work. (Academic).*

*I enjoy it and I feel like there is still growth to come. (Academic).*

*My efforts are valuable, and I enjoy most of my work. The mix of young and old persons from different origins is stimulating. (Academic).*

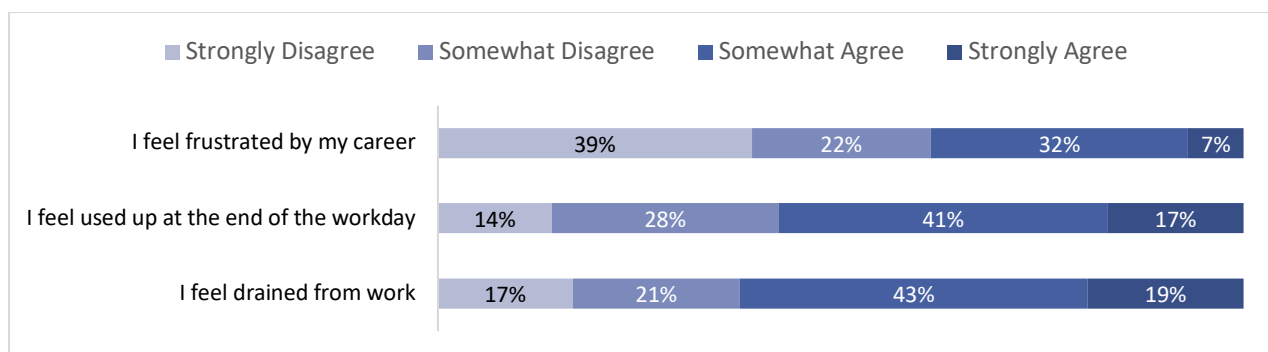
*I love the interaction with university students and to conduct frontline research. (Academic).*

Findings also identified that respondents who intend to change jobs in the next two years report a lack of informal/semi-formal (36.4%), and formal (53.3%) workplace flexibility options.

### Work-related Emotional Exhaustion

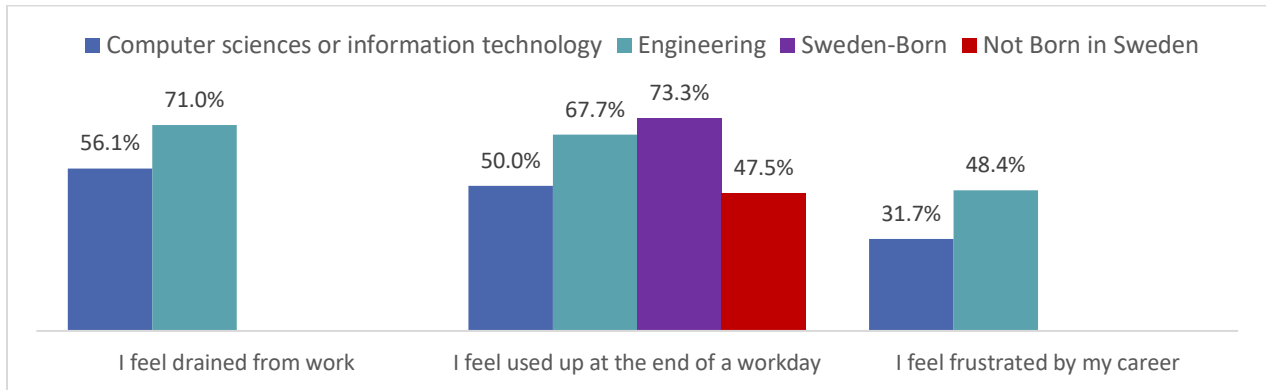
Three individual items were used to measure emotional exhaustion (see Figure 9). Overall, most respondents *agree* that they experience some emotional exhaustion. More specifically, most experience feeling drained from work, and/or feeling used up at the end of the workday. However, only 39% report feeling frustrated by their careers.

*Figure 9: Work-related Emotional Exhaustion*



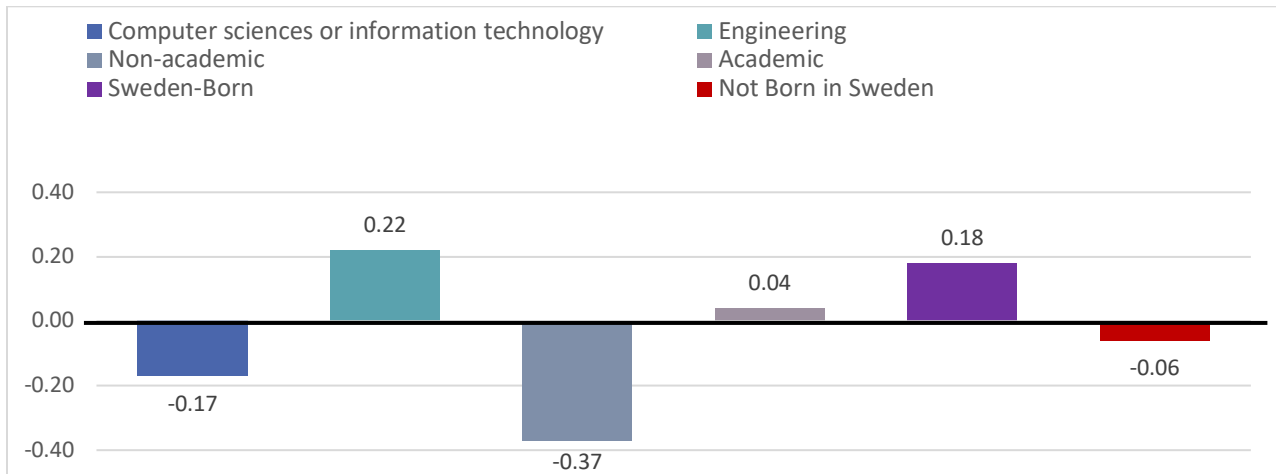
A closer examination of emotional exhaustion (Figure 10) shows that engineering respondents are more likely to feel emotionally exhausted across all individual measures than CSIT respondents. In addition, respondents born in Sweden are more likely to agree to feeling used up at the end of the workday than respondents born elsewhere.

Figure 10: Emotional Exhaustion by Work Type and Nativity



An Index reflecting overall emotional exhaustion was computed. As illustrated in *Figure 11*, non-academic ( $M = -.37$ ,  $SD = 1.09$ ) and/or CSIT ( $M = -.17$ ,  $SD = .92$ ) respondents scored the lowest - indicating below average emotional exhaustion. By contrast, engineering respondents ( $M = .22$ ,  $SD = 1.08$ ) and/or Sweden-born respondents ( $M = .18$ ,  $SD = .99$ ) recorded the highest scores - indicated above average emotional exhaustion.

Figure 11: Overall Emotional Exhaustion Index



### Emotional Labour Experiences with Colleagues or Co-workers

Respondents were asked a series of questions about their experiences with colleagues or co-workers. Results indicate that respondents engage in emotional labour with colleague(s)/co-worker(s). For example, 59.7% of respondents have been in a situation where colleague(s)/co-worker(s) have cried in their presence; 93% have had colleague(s)/co-worker(s) talk about extreme stress/distress or long-term mental health problems; and 22.5% have experienced a

colleague(s)/co-worker(s) disclose suicidality, substance abuse, domestic/dating violence and/or sexual harassment or abuse.<sup>3</sup>

#### Student-related Emotional Labour (Academic Respondents Only)

Academic respondents also experience emotional labour with students. Nearly one-half of academic respondents reported that in the past five years students have cried in their presence (49.2%). However, more than three-quarters of respondents indicated experiencing students having discussed extreme stress/mental health with them (79.4%). In addition, 22% of academic respondents report experiencing students disclose suicidality, substance abuse, domestic/dating violence, and/or sexual harassment or assault (self or others).

Across work areas, more CSIT academic respondents indicate experiencing students cry in their presence compared to engineering respondents (59.4% vs. 34.6%) or disclose feelings of stress/distress/mental health (81% vs. 77%). However, more engineering respondents (34.7%) report experiencing students disclose suicidality, substance abuse, domestic/dating violence, and/or sexual harassment or assault (self or others) compared to CSIT respondents (13.5%).

The survey also revealed that Sweden-born respondents had more experiences with students crying in their presence or talking about extreme stress/distress compared to respondents born elsewhere (37% vs. 23.6%).

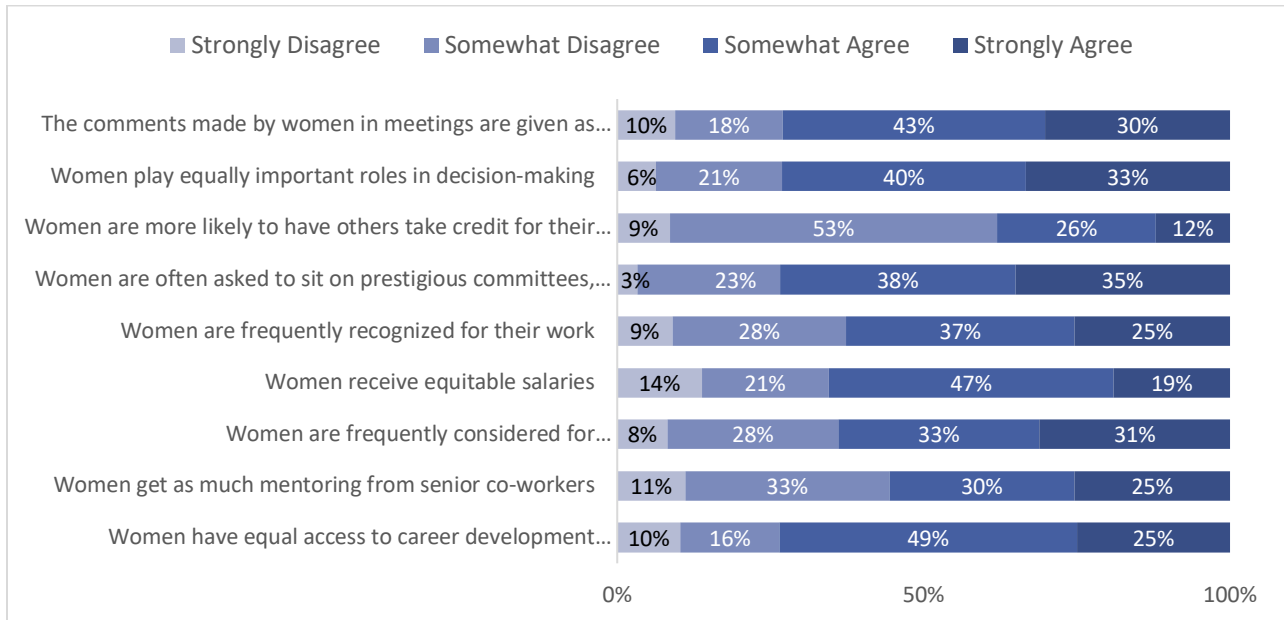
#### Gender Equity within Workplaces

Respondents were asked a series of questions about their perceptions of gender equity within their workplaces (Figure 12). Overall, most respondents *agree* (somewhat or strongly) that within their workplaces women: have equal access to career development opportunities (74%); receive equitable salaries (66%); are frequently recognized for their work (63%); are often asked to sit on prestigious committees, work and/or project groups (73%); play equally important roles in decision making (73%); and have their comments given as much credit and attention in meetings (73%). However, respondents were less likely to agree that women get as much mentoring from senior coworkers as men (56%). In addition, over one-third of respondents agree that women are more likely to have others take credit for their work (38%).

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<sup>3</sup> Note: Totals exceed 100% to account for respondents with multiple experiences of emotional labour.

Figure 12: Perceptions on Gender Equity within Workplaces



A closer examination reveals that CSIT respondents are more likely to perceive women as having equal access to career and development opportunities as men compared to engineering respondents (77.5% vs. 67.9%). More engineering respondents (68%) perceive women as having others take credit for their work compared to CSIT respondents (57.6%).

Interestingly, when examining perceptions of gender equity within workplaces among Sweden-born and non-Sweden born respondents, we find Sweden-born respondents to be more pessimistic. For example, over one-third of Sweden-born respondents *disagree* to the statement “women have equal access to career development opportunities” (35.7%). By contrast, fewer than one-quarter of respondents born elsewhere shared that same opinion (21.1%).

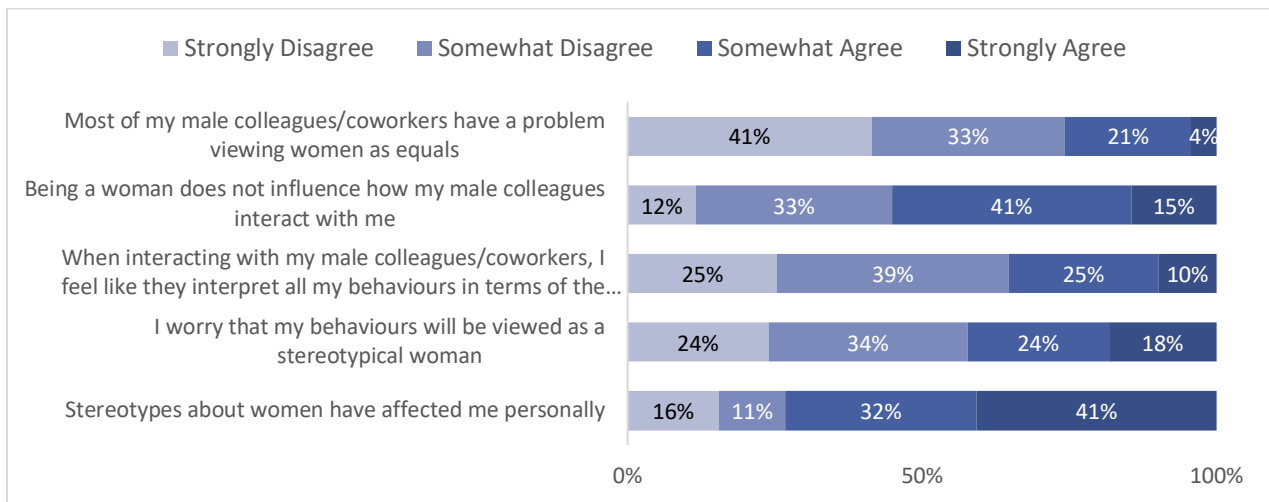
#### Perceptions on Management/Leadership’s Gender Equity Commitments

Respondents had mixed opinions on their workplaces’ commitment to promoting gender equity. Over one-half of respondents do not perceive their leaders/management as caring about improving gender equity (57.6%). As well, three-quarters of respondents *agree* that their leaders/management responsible for promoting gender equity are overloaded with too many other work responsibilities (73.8%). In addition, many feel that the people responsible for improving gender equity do not have the resources they need to make any meaningful change (63.5%), and that the people responsible for improving gender equity do not get the cooperation they need from others (65.6%).

## Gender Stereotyping in Workplaces

Respondents also have concerns about gender stereotyping, and some have experienced it within their workplaces. As illustrated in Figure 13, nearly three-quarters of respondents *agree* (somewhat or strongly) that stereotypes about women have personally affected them. While most respondents indicate some equality within their interactions with colleagues/coworkers, some are still impacted by gender stereotyping. For example, 45% of respondents *disagree* (strongly or somewhat) that being a woman *does not* influence how male colleagues interact with them.

Figure 13: Perceptions on Gender Stereotyping in the Workplace

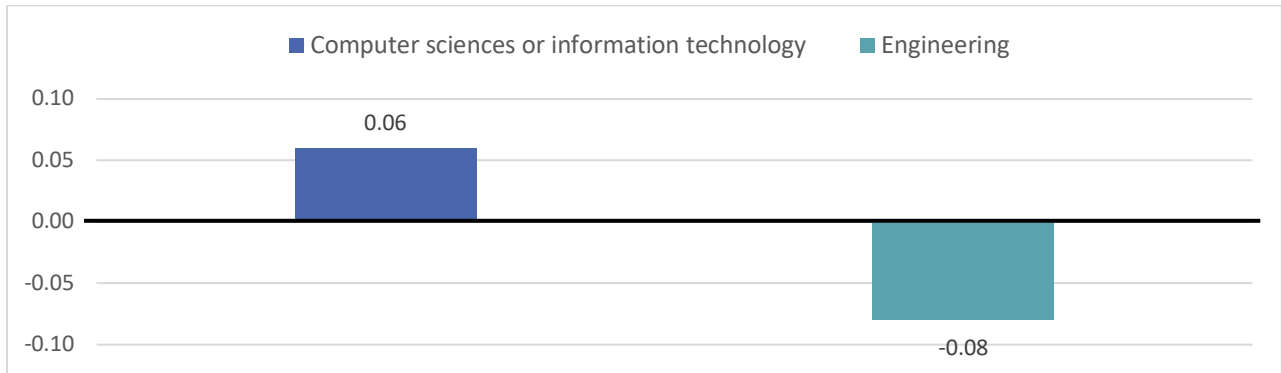


There are some differences in perception of gender stereotyping by work type. CSIT respondents are more likely to *agree* that stereotypes about women have personally affected them compared to respondents working in engineering (78% vs. 66.7%). CSIT respondents are also more likely to *disagree* that being a woman does not influence how men colleagues interact with them (63.2% vs. 45.2%).

In terms of country of origin, our survey indicates that Sweden-born respondents were more likely to *agree* that stereotypes about women have personally affected them compared to respondents born elsewhere (80% vs. 69.2%). However, more respondents born outside of Sweden (60.5%) indicate that being a woman influences how men colleagues interact with them compared to Sweden-born respondents (50%).

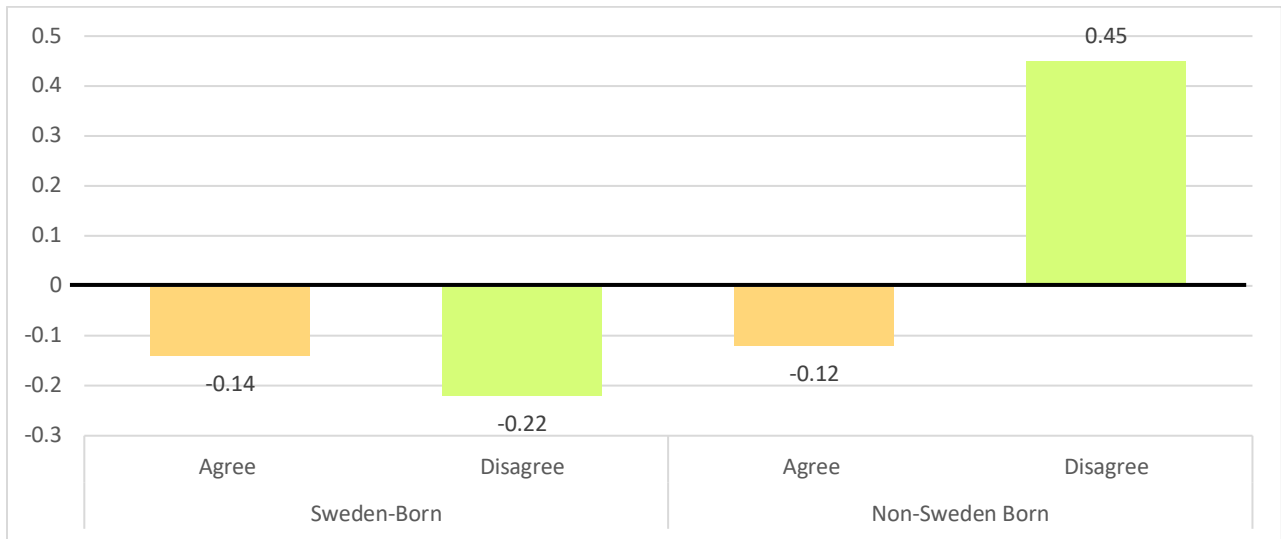
An Index was computed to examine personal experiences of gender-based exclusion. As illustrated in Figure 14, CSIT respondents scored high on the Index indicating above average experiences with gender-based exclusion ( $M = .06$ ,  $SD = .97$ ). By contrast, engineering respondents scored low, indicating below average experiences ( $M = -.08$ ,  $SD = 1.05$ ) of gender-based exclusion in the workplace.

Figure 14: Personal Experiences of Gender-based Exclusion within the Workplace



We also examined experiences of gender-based stereotyping along with workplace alienation and country of origin (see Figure 15). We find that respondents born outside of Sweden who *disagree* to the statement “being a woman does not influence how my male colleagues interact with me” score the highest on the index ( $M = 0.45$ ,  $SD = 1.08$ ). This indicates above average workplace alienation for these respondents. By contrast, Sweden-born respondents scored low on the Index - indicating below average workplace alienation regardless of their agreement to this statement.

Figure 15: Workplace Alienation Index by Gender Stereotyping and Country of Origin

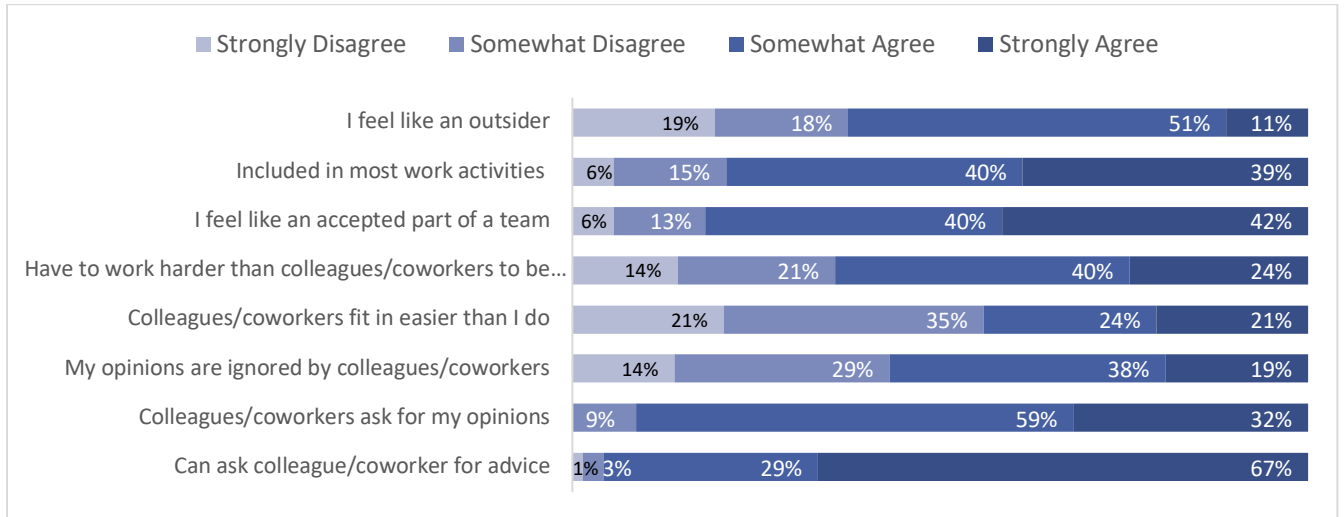


### Perceptions on Workplace Support and Inclusion

Overall, respondents had positive perceptions about workplace support and inclusion (see Figure 16). However, there are some notable findings that indicate exclusion and lack of support within EICT workplaces. Specifically, one-half of respondents *agree* that they have had their opinions ignored by colleagues/co-workers (56.9%), and that they view their colleagues/co-workers as having an easier time “fitting in” (44.1%). Even worse, 62.5% of respondents indicate feeling

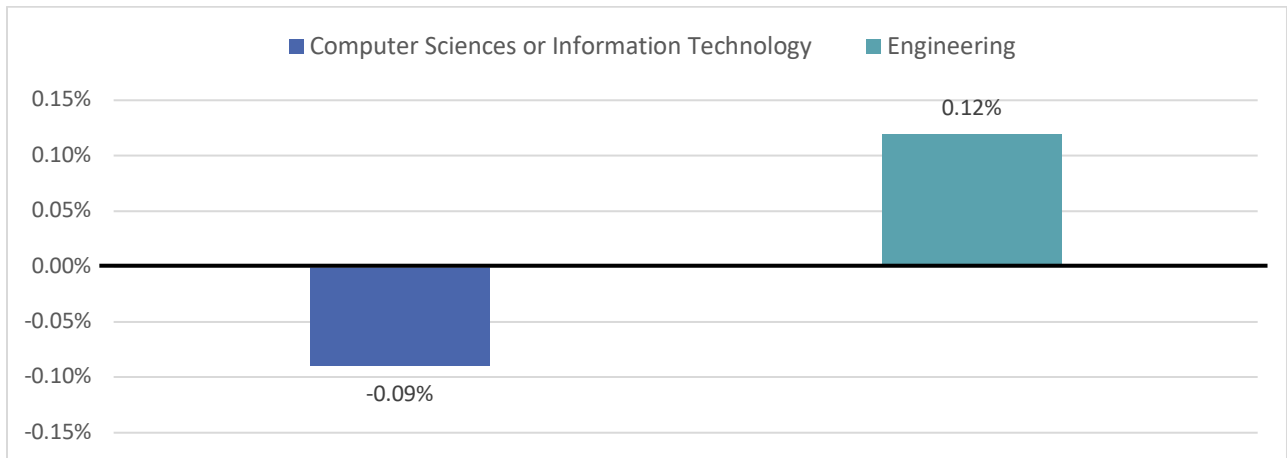
like an outsider within their workplaces, and 64.3% feel that women must work harder than men in order to be viewed as “legitimate”.

Figure 16: Workplace Support and Inclusion



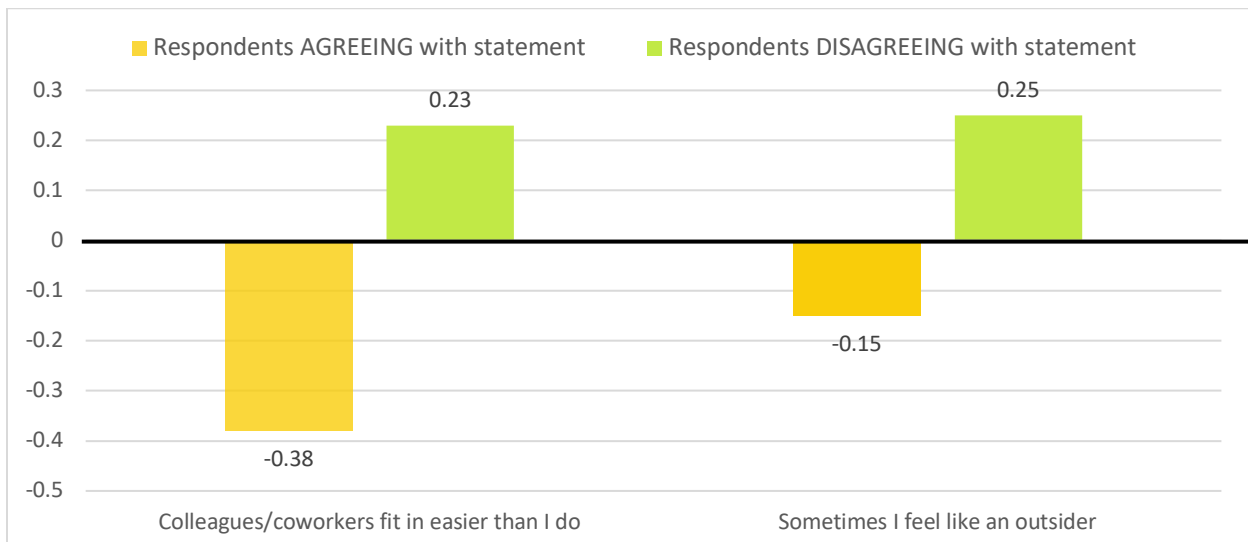
An Index was computed to analyze overall trends in personal experiences with workplace support and inclusion. As shown in Figure 17, respondents working in engineering record a positive score ( $M = .12$ ,  $SD = .99$ ) indicating above average workplace support and inclusion, while CSIT respondents recorded a negative score ( $M = -.09$ ,  $SD = 1.01$ ), indicating below-average workplace support and inclusion.

Figure 17: Workplace Support and Inclusion Index



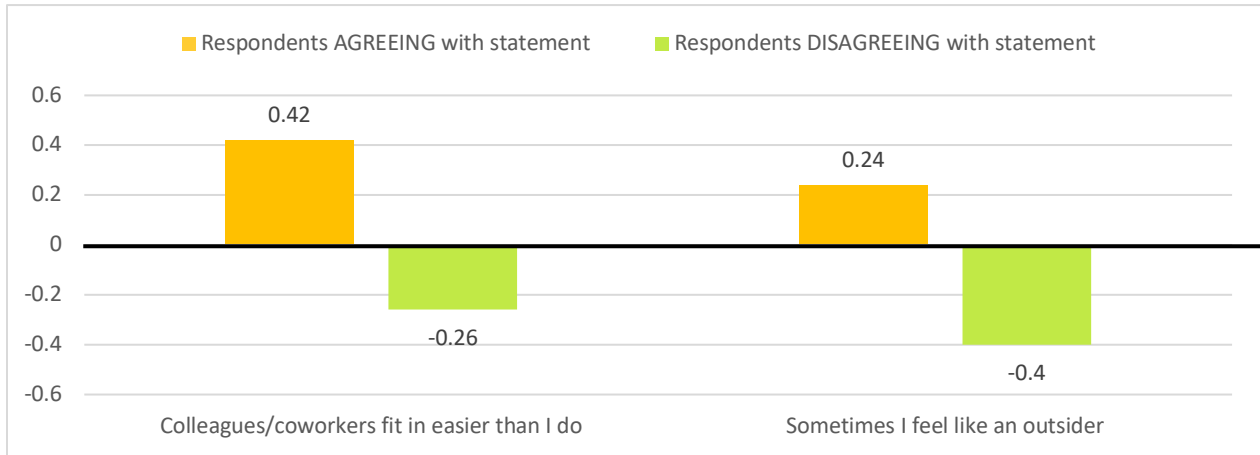
Additional analyses were conducted examining personal experiences of workplace support and inclusion along with the Career Satisfaction Index as an outcome measure. Positive scores on the Index indicate above average career satisfaction, and negative scores indicate below average career satisfaction. As illustrated in Figure 18, respondents who *agree* with the statement “sometimes I feel like an outsider” recorded lower scores on the Index. In other words, respondents who *agree* with this statement had lower career satisfaction ( $M = -.15$ ,  $SD = .97$ ). However, respondents who *disagree* with this statement recorded positive scores and had more career satisfaction ( $M = .25$ ,  $SD = 1.00$ ). In addition, respondents who *disagree* to the statement “colleagues/coworkers fit in easier than I do” recorded lower scores than those who *agree* to this statement. Overall, this indicates that respondents who experience workplace exclusion or lack of support were less satisfied by their careers.

Figure 18: Career Satisfaction Index by Workplace Support and Inclusion



We also examine personal experiences of workplace support and inclusion along with the Workplace Alienation Index as an outcome measure. Positive scores indicate above average workplace alienation, and negative scores below average workplace alienation. As shown in Figure 19, respondents who *agree* to statements indicating *exclusion* such as “sometimes I feel like an outsider” ( $M = .24$ ,  $SD = .99$ ) or “colleagues/co-workers seem to find it easier than I do to fit in” ( $M = .44$ ,  $SD = .87$ ) recorded high scores on the Index and above average workplace alienation. By contrast, respondents who *disagree* with such statements indicating more workplace *inclusion* and support scored low. This suggests below average workplace alienation.

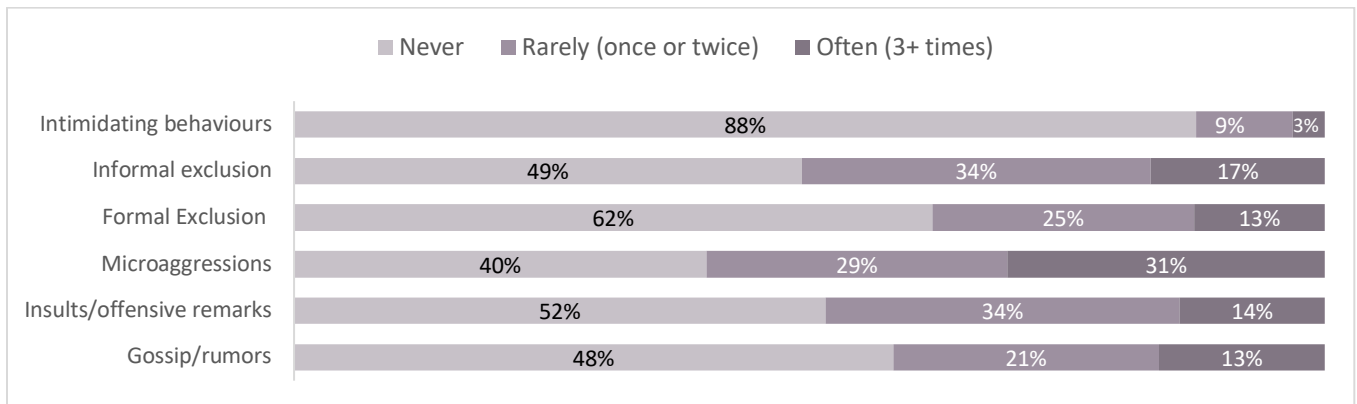
Figure 19: Workplace Alienation Index by Workplace Support and Inclusion



### Exclusion, Discrimination and Harassment in the Workplace

Three-quarters of respondents indicate that they have experienced at least one incident of workplace hostility or other negative experiences (76.5%). Figure 20 illustrates the prevalence of these experiences. As shown, overt forms of harassment or discrimination are less common, but they do occur. For example, 12.4% of respondents have experienced intimidating behaviours in their workplaces (12.4%). In addition, many respondents report having experienced other forms of harassment including microaggressions (60%), insults or offensive remarks made about them (48.5%), and gossip/rumors (34.6%). Exclusion is also common, with one-half of respondents having experienced exclusion from informal gatherings (50.7%), and over one-third experienced exclusion from formal group events/meetings (38.1%).

Figure 20: Frequency of Experiences - Exclusion, Discrimination, and/or Harassment



Open-ended comments from respondents illuminate on some of the types of hostility, exclusion, and/or negative experiences women face in the workplace:

*I was prepared to act as a role model for girls in STEM when I started my career. Nowadays, I am not sure if I want girls to be pressured to pursue male-dominated careers. Sexist comments, misogynists, and the feeling of not belonging are too often present. Well, not nowadays when I am almost 40, but younger, until I found my feminist voice it was not a pleasant experience. Constant self-doubts, imposter syndrome, low self-esteem because of comments that as a woman you cannot possibly grasp the concepts, fear of asking questions to not to look dumb. I do not know now. I feel so much rage sometimes when I listen to those comments and I do not know if I wish this for girls. (Academic).*

*There is too much that depends on whether you happened to be present when that informal conversation took place. They don't actively exclude you, but they do make decisions when they happen to meet in, for instance, the coffee room. And then, unless someone really remembers to inform you, by the time you learn about this topic everything is already decided. By then you are notified of the decision rather than part of the decision-making process. (Academic).*

*The following [reasons have] led me to avoid eye contact with certain individuals. Winking to any degree but especially repetitive and whilst trying to have a one-on-one conversation about research. Looking at my chest. Being stared at for uncomfortably for a long time, without them or I saying anything, until I looked away. (Academic).*

*I am quite disappointed how many misogynists still exist and openly and proudly state sexist jokes and derogatory language. The sexist jokes happen too many times to be honest. (Academic).*

*They ignore me. Most are male and not very sharing on personal life. Very "professional". (Non-Academic).*

*You do not want to be marked as a whiner/complainer - as we are supposedly equal, (but we are so not). Official vs reality are two different things. Very subtle though. People speak over me, do not hear me, ignore me etc. Lots of mansplaining. (Non-academic).*

*I was surprised to find out that contrary to gender equality reports ranking Sweden rather high, this does not seem to be the case and have encountered discrimination which I think is due to my gender. Being left out of meetings and feeling isolated is the major problem. Supervisors and peers also seem to respect females less than males. (Academic).*

*I have in the past actually called out a superior for once making suggestive comments about me and a male co-worker who simply happened to be in the same room, and said that I expected so much better behaviour from someone in a position of power over myself. He actually improved his behaviour immediately after that. (Academic).*

*I think that it is a big problem that PhD students are under the power of supervisors. They can be mistreated when the supervisors abuse their power, especially since the supervisions are "behind closed doors". I think it should be a rule that PhD students should have at least 3 supervisors. (Academic).*

Respondents also clarify that not all harassment or discrimination comes from men colleagues/coworkers. Women colleagues, coworkers, and supervisors can also be perpetrators of gender-based discrimination or harassment.

*Most of the gender-based discrimination I faced actually came NOT from male colleagues, but from a female supervisor openly stating that I was being treated differently and held to a double standard because of my presumed gender, ironically out of a patronizing desire to "protect" me, even though I have only had one case where a single male coworker said something that could be construed as discriminatory (and other male coworkers jumped to my defense), and have never felt excluded or thought less of by my male colleagues. (Academic).*

*Please note that behaviours and attitudes against women is not exclusively done by men, also women can behave with inequality or have unequal attitudes towards other women. (Academic).*

*No one would "dare" to harass me in my workplace today. But in general people are not respectful in many other ways. Note ALSO some female leaders (who adopted the same values).*

Open-ended comments also indicate that harassment and discrimination against other minoritized statuses are problems within Sweden. These comments indicate an intersectional element to understanding harassment and discrimination within Swedish workplaces.

*I have observed more overt stereotyping and discrimination based on race/ethnicity/nationality than gender in my workplace, but feel that this is very rarely addressed, as most of Sweden's diversity initiatives have a laser focus on gender and ignore ethnic/racial diversity. And personally, most of the microaggressions I've experienced were the result of disability (I am diagnosed with both ADHD and autism) and not gender. However, I should note that at least one female colleague feels that she's had issues at work and was treated differently because of her gender, so my experience is obviously not universal. As a final note, I am actually non-binary but I am legally female, perceived as female, and use female pronouns out of a concern that my gender identity will not be taken seriously. (Academic).*

*I have been excluded from informal discussions due to language barriers rather than gendered issues. The reasons might be gender-relevant but not exclusively. (Academic).*

### Reporting Exclusion, Discrimination and/or Harassment and Workplace Responses to Reports

We asked respondents who have experienced exclusion, discrimination and/or harassment about reporting the incident(s). We found that across all individual measures, most respondents *did not*

formally report experiencing workplace hostility or negative experiences. However, when comparing the individual measures, respondents were more likely to formally report experiencing direct forms of harassment such as intimidating behaviours (33.3%), having insults/offensive remarks made about them (35.5%) or being excluded from formal networks within the workplace (20.8%). They were less inclined to formally report subtle or indirect forms of exclusion, discrimination, and/or harassment such as microaggressions (15%), exclusion from informal discussions (12.9%), and/or having gossip spread about them (12%).

There are some differences in the likelihood of reporting incidents by country of origin. While the overall likelihood of formal reporting is low, Sweden-born respondents were nearly twice as likely to report incidents compared to respondents born elsewhere (50% vs. 29.6%)

Open-ended comments illustrate the difficulties women experience in reporting negative experiences and incidents such as not being able to maintain their anonymity during the reporting process:

*I thought that it was impossible to preserve my anonymity if I reported. Perhaps the person I reported would change as a result of the report, but I was afraid that they would also guess I had been the one reporting and that they would block opportunities, etc. for me. I also think microaggressions are really hard to report because most times people find ways of motivating that the situation was not about gender. (Academic).*

*It only happened when I was alone with the co-worker - and in meetings they made clear that if you report, you can't stay anonymous and that they will ask the other person. So, in general, what they said is that if there is no evidence, nothing but telling the person that harassed me that they were reported will be done. Due to that, I had problems being at the office. (Academic).*

*At my department, they did an anonymous survey about bullying and (sexual) harassment. The results have shown that multiple people were/are affected by that. When they presented the results to us, the main thing they did (at least it seemed to me and some female co-works like that) was complain that not enough came forward. However, it is known that coming forward does more harm than good in our department based on past experiences (personally and through other people). As I have experienced some of these as well, I don't feel safe to report it, and as a result, I sometimes don't feel safe in my work environment. This also affects my work efficiency, and I know from other females in my department that they feel the same. (Academic).*

*I personally did not report because other women reported such cases before me, and it ended badly for them. Nothing was done but inform the person that it was reported causing the situation for the women to be even worse. Our department management always highlights that we should report and that they want to help, but if something really happens, they just tell you to talk to that person and leave you alone. (Academic).*

*It was just oral reporting and was not taken seriously. I felt that a formal report would not be welcome. Other parts of the management were more supportive. However, the only action was to change supervisor. (Academic).*

Comments also reveal that respondents may engage other strategies such as changing jobs to deal with negative workplaces experiences:

*I changed workplaces in the past two years. Unfortunately, that was the only solution I could see to have a positive change in my life. The new workplace is been more respectful so far. (Academic).*

*I have chosen a workplace with mainly women in leading positions at the cost of going a bit of my main research interests. (Academic).*

*I had to leave the workplace, employer - sexual harassment and "word against word" report. (Non-academic).*

*I am in a management position, so many of these incidents you just have to let go of, otherwise you will not be able to work. People like to gossip and say things about department management, it comes with the job. When something happens I talk about it with my closest management team colleagues and then we normally move on from there. If something/someone needs confrontation, then I would confront, most of the time that is not necessary. (Academic).*

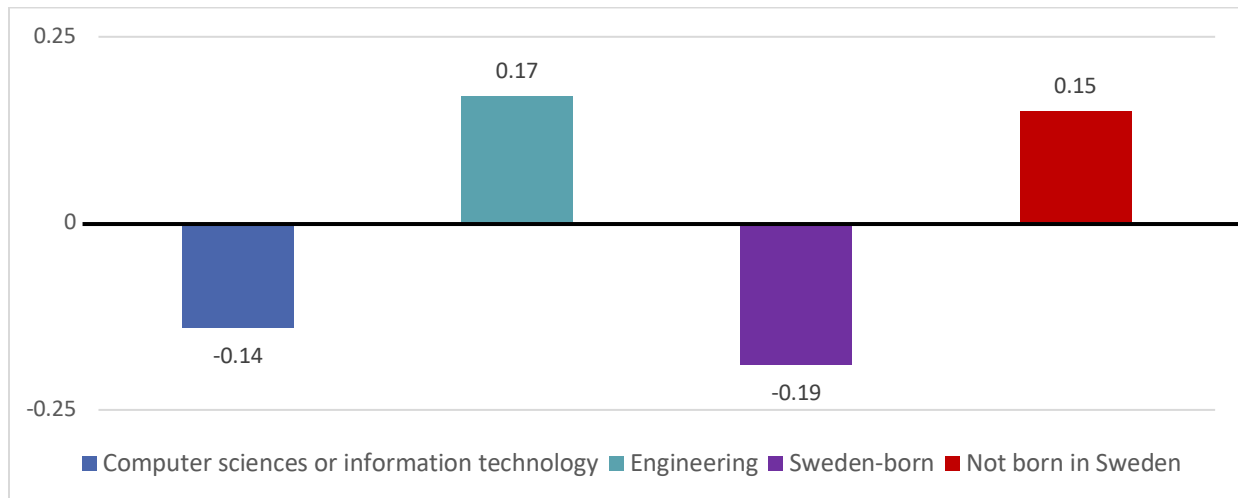
### Sexual Harassment and Sexual Microaggressions

Respondents were asked a series of questions about their experiences with sexual harassment or sexual microaggressions. Some respondents have experienced sexual microaggressions like having rude/offensive sexual jokes/remarks made to them (28.4%); being stared, leered, or ogled in a way that made them feel uncomfortable (20.9%); and unwelcomed attempts to draw them into discussing sexual matters (19.7%).

Respondents working in engineering were more likely to experience being whistled at or catcalled (40.7% vs. 20%), and/or being stared, leered, or ogled in a way that made them feel uncomfortable (33.3% vs. 12.5%) compared to CSIT respondents. Additional minoritized identity may also impact experiences of sexual harassment/microaggression. For example, respondents not born in Sweden are more likely to experience being whistled at or catcalled compared to Sweden-born respondents (37.8% vs. 17.9%).

As shown in Figure 21, the Index of Sexual Microaggression Incidents reveals that engineering respondents ( $M = .17$ ,  $SD = 1.09$ ) and/or respondents not born in Sweden ( $M = .15$ ,  $SD = 1.06$ ) recorded positive scores. This indicates above average incidents of sexual microaggressions within the workplace. By contrast, Sweden-born respondents and/or respondents working in CSIT recorded negative scores indicating below average sexual microaggression incidents.

Figure 21: Index of Sexual Microaggression Incidents

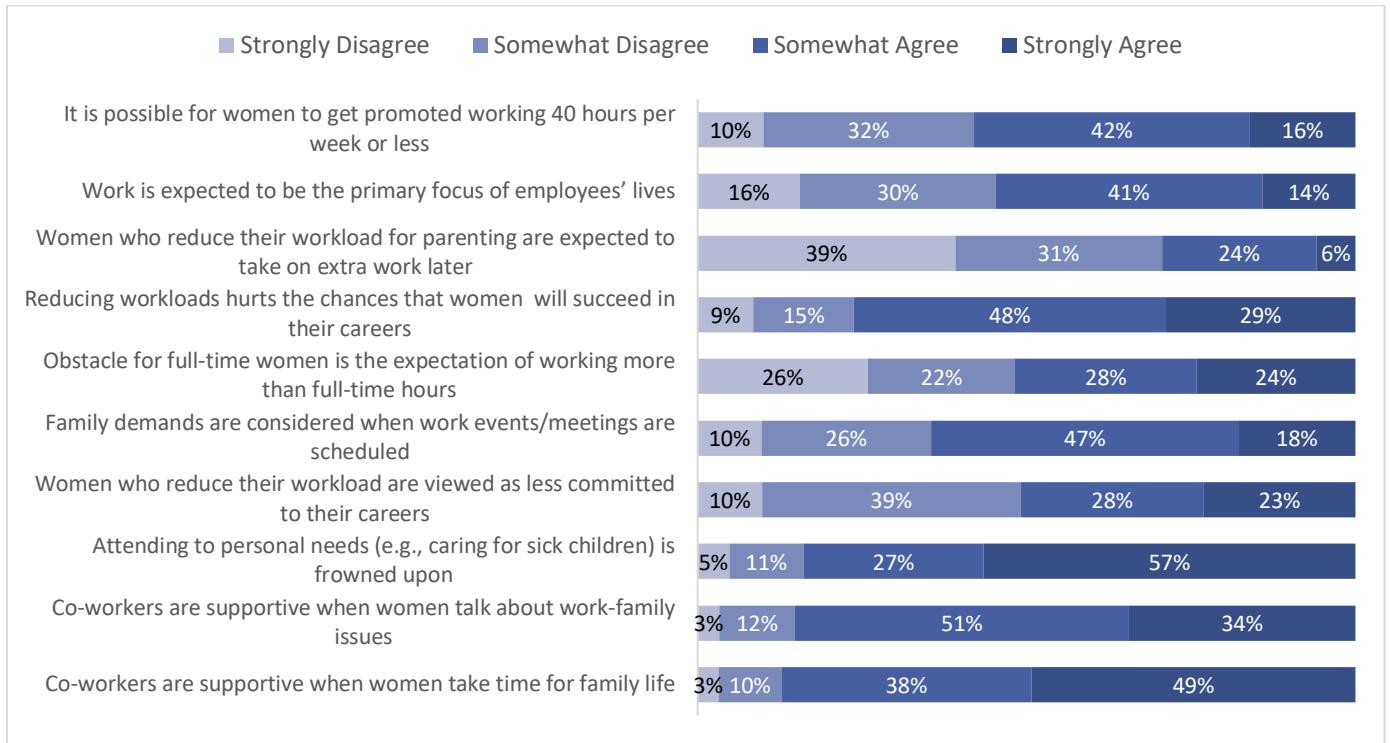


We examined personal experiences of sexual harassment/microaggressions with the Workplace Alienation Index as an outcome measure. Across the individual measures, respondents who indicated having experienced sexual harassment or microaggression like having rude/offensive sexual jokes or remarks made to them ( $M = .39$ ,  $SD = .99$ ), and/or experience being stared, leered, or ogled ( $M = .40$ ,  $SD = 1.03$ ) scored high on the Index. By contrast, respondents who have not experienced these incidents scored low ( $M = -.15$ ,  $SD = 1.01$  and  $M = -.09$ ,  $SD = 1.03$ , respectively). This suggests that respondents who experience these types of sexual microaggression/harassment record above average workplace alienation.

### Work-Life Balance

We asked respondents a series of questions pertaining to their perceptions of work-life balance. As illustrated in Figure 22, most perceive their co-workers as supportive when taking time for family life (87%), talking about work-family issues (85%), and when attending to personal/caregiving needs (84%). However, respondents also *agree* that maintaining a work-life balance can negatively impact women's careers.

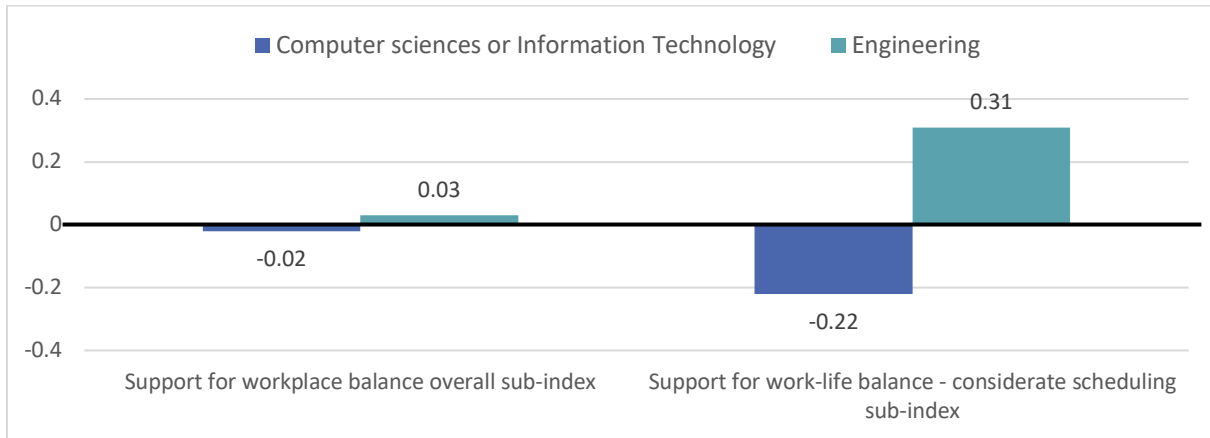
Figure 22: Perceptions on Work-Life Balance



Across work areas – we found that engineering respondents were more likely to *agree* to the statement “work is expected to be the primary focus of employees’/faculty members’ lives” compared to CSIT respondents (63% vs. 48.6%). However, fewer than one-half of CSIT respondents *agree* to the statement “it is possible for women working full time to get promoted working 40 hours per week or less on a regular basis” (46.4%). By contrast, nearly three-quarters of engineering respondents *agree* to this statement (72.7%).

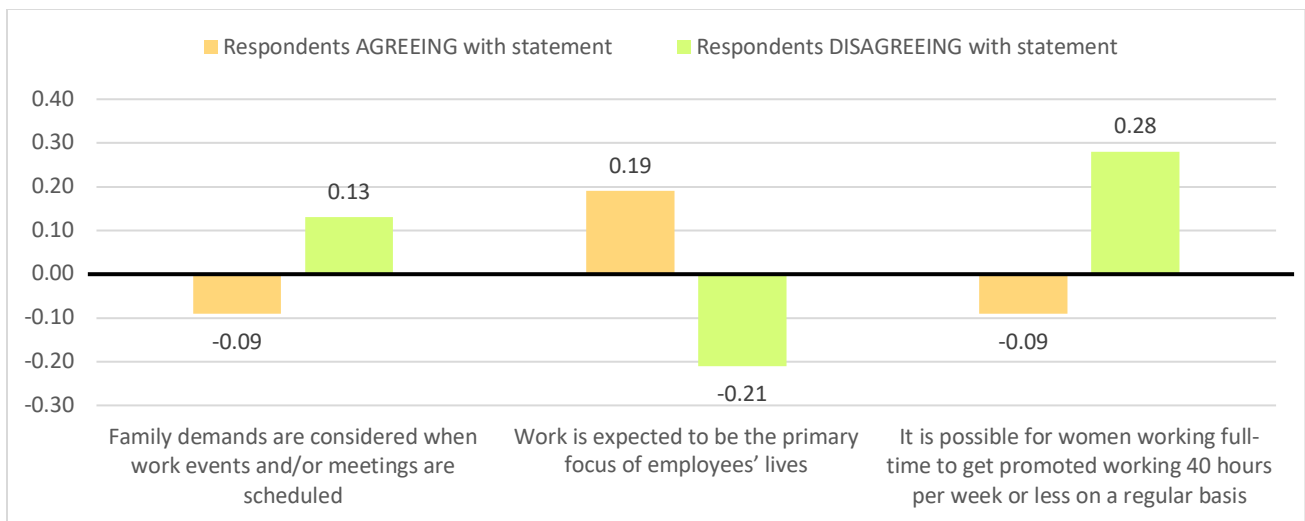
We computed a Workplace Culture Conducive to Women’s Success (CCWAS) Index to examine support for work-life balance. CSIT respondents record a negative score on the sub-index for workplace balance overall ( $M = -.02, SD = .98$ ) – indicating their workplace culture offers slightly below average support for work-life balance (Figure 23). By contrast, engineering respondents recorded a slightly positive score on workplace balance overall sub-index ( $M = 0.03, SD = 1.05$ ) indicating a workplace culture with above average support for work-life balance. We also found that engineering respondents scored high ( $M = .31, SD = .92$ ) on the ‘considerate scheduling sub-index,’ whereas CSIT respondents scored low ( $M = -.22, SD = 1.00$ ). This indicates that engineering respondents have above average perceptions that their workplaces will take into consideration family demands when scheduling work events or meetings to support work-life balance and, therefore, above average perceptions of CCWAS. By contrast, CSIT respondents have below average perceptions of CCWAS.

Figure 23: Workplace Culture Conducive to Women’s Success (CCWAS) Index



We also examine perceptions of work-life balance along the Workplace Alienation Index as an outcome measure. As shown in Figure 24, respondents who perceive their workplaces as not supporting work-life balance such as by *disagreeing* to the statements: “it is possible for women working full time to get promoted working 40 hours per week or less on a regular basis” (M = .27, SD = 1.06) or “family demands are considered when work events and or meetings are scheduled” (M = .19, SD = 1.04) recorded high scores. This indicates above average workplace alienation for these respondents. By contrast, respondent who *agree* to these statements indicate that their workplaces support work-life balance - scored low on the Index and have below average workplace alienation.

Figure 24: Workplace Alienation Index by Perceptions on Work-Life Balance



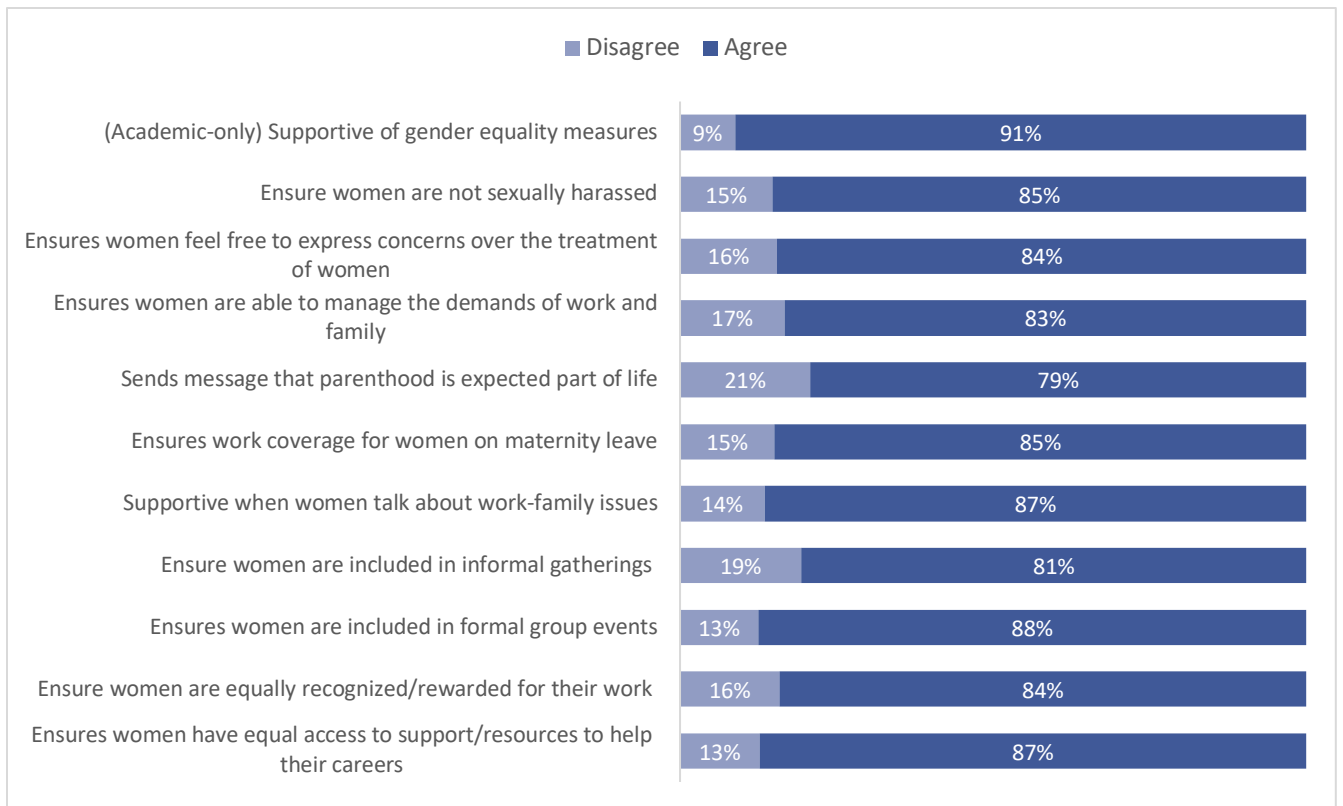
We also asked respondents a series of questions about the supportiveness of their supervisors or management for gender equality (Figure 25). Respondents mostly view their supervisors or management as being supportive of women within the workplace. However, one-in-five

respondents *do not agree* that their supervisors or management sends a message to employees that parenthood is an expected part of life (21%), nor ensures that women are included within informal workplace gatherings (19%).

When comparing work areas, there is greater disparity in the statement “my supervisor/head tries to ensure that women are not subject to subtle gender-based biases”. Accordingly, more engineering respondents *agree* to this statement (96%) compared to CSIT respondents (77.8%).

Similarly, we found that Sweden-born respondents were also more likely to *agree* to this statement (92%) compared to respondents born elsewhere (82.4%). However, Sweden-born respondents were less likely to agree to the statement “my supervisor/head tries to ensure that women have equal access to support and resources to help them in their careers compared to men” than non-Sweden respondents (77.8% vs. 94.1%).

Figure 25: Perceptions of Supervisors/Managements’ Supportiveness of Gender Equality

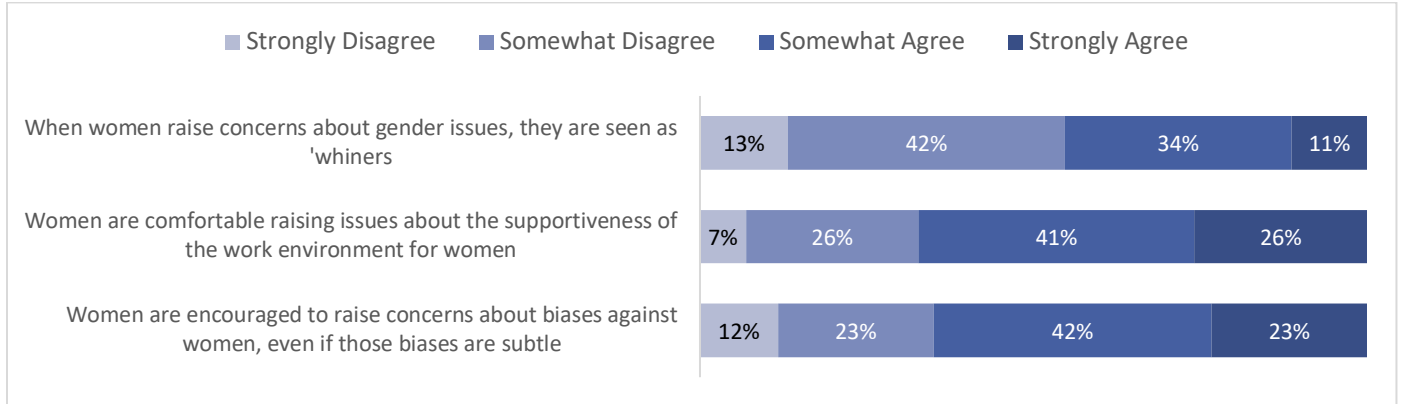


### Supportive Workplaces:

We asked respondents working in the academic sector a series of questions about gender support within the workplace. As shown in Figure 26, most respondents *agree* that their workplaces are supportive of women. However, nearly one-half of respondents still believe that when women raise concerns about gender issues, they are seen as “whiners” (45.3%). In addition, one-third of respondents do not perceive their workplaces as being comfortable spaces for women to raise

concerns about supportive work environments for women (32.8%), nor that women are encouraged to raise concerns about gendered biases in the workplace (35%).

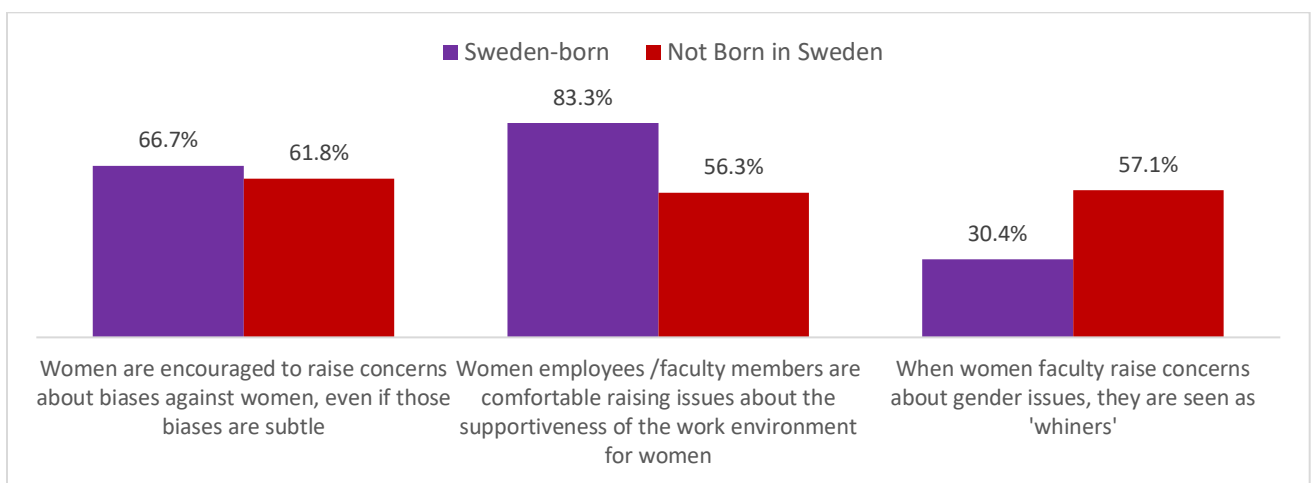
Figure 26: Gendered Supportive Workplaces



When we compare agreement to these statements by country of origin (Figure 27) - we find respondents born outside of Sweden are less comfortable raising issues about the supportiveness of the work environment for women and are more likely to *agree* that when women faculty raise concerns about gender issues, they are seen as whiners.

In addition, we computed a Freedom from Gender Bias Index and found that Sweden-born respondents scored high on the Index indicating above average perceptions of workplaces being free of gender bias ( $M = .24, SD = .97$ ). By contrast, respondents born outside of Sweden scored low on the Index indicating below average perceptions of workplaces being free of gender bias ( $M = -.19, SD = 1.02$ ).

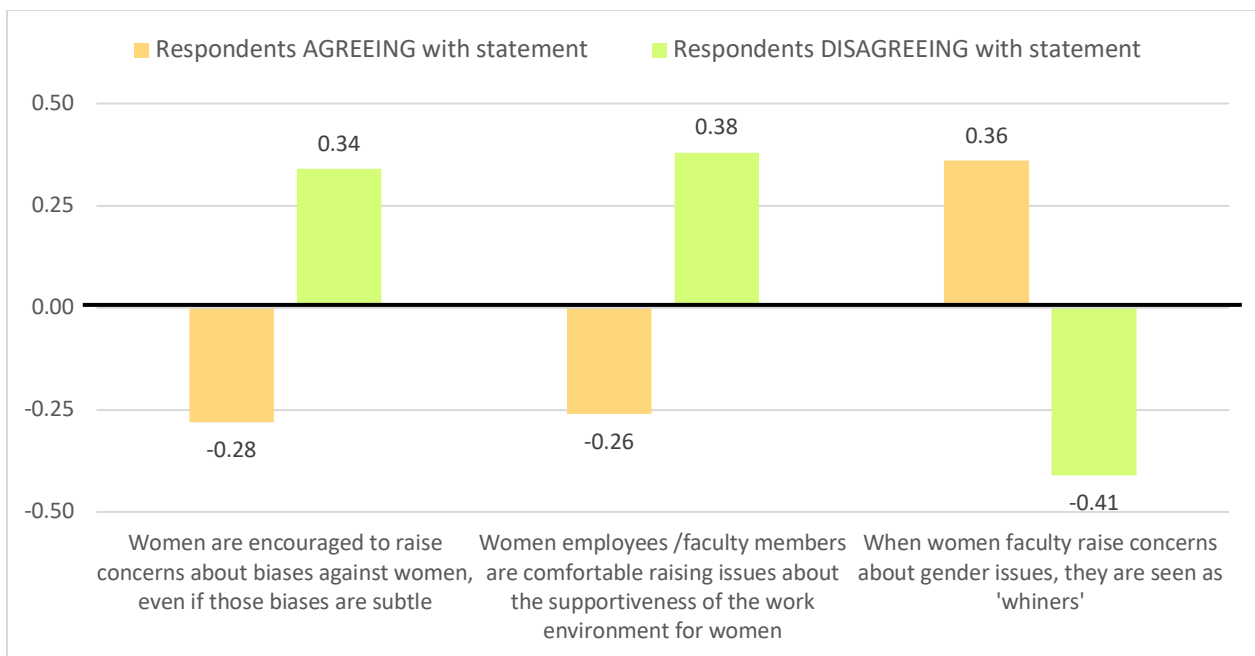
Figure 27: Perception of Gendered Supportive Workplaces by Country of Origin



When examining job attrition, 41.2% of respondents who indicated plans to change jobs in the next two years *disagree* to the statement “women employees or faculty members are comfortable raising issues about the supportiveness of the work environment for women”. In addition, 43.5% of these respondents also agree to the perception that women who raise concerns about gender issues in the workplace are seen as whiners. This suggests that unsupportive workplaces may contribute to job attrition.

To investigate this further, we examined gendered supportive workplaces and the Workplace Alienation Index as an outcome measure. As shown in Figure 28, respondents who indicate unsupportive workplaces scored high on the Index, indicating above average workplace alienation. For example, respondents who *disagree* that their workplaces encourages women to raise concerns about gender bias ( $M = .37, SD = 1.09$ ), or *disagree* to women being comfortable raising issues about the supportiveness of the work environment for women ( $M = .34, SD = 1.01$ ) recorded positive scores on the Index. As well, respondents who *agree* that women who raise concerns about gender issues are seen as ‘whiners’ scored high ( $M = .36, SD = 1.14$ ). By contrast, respondents who indicated differing opinions to these statements had negative scores or below average workplace alienation.

Figure 28: Workplace Alienation Index by Gendered Supportive Workplaces

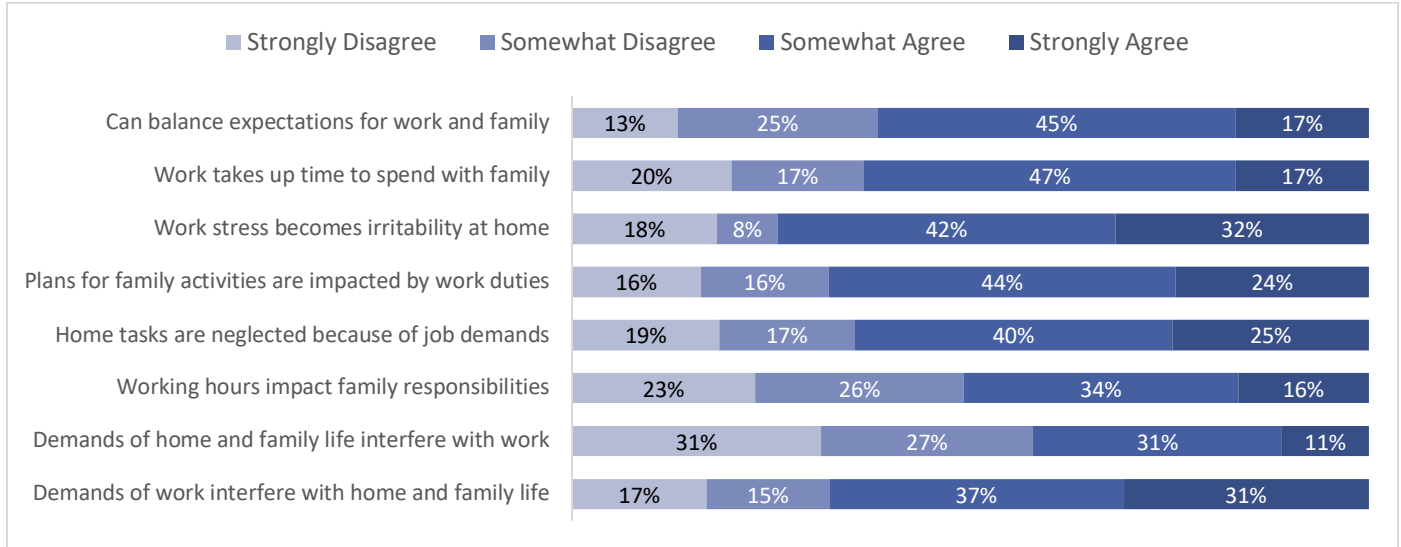


### Work-Life Interference

Respondents highlight various pressures of work on personal/home life, and the interference of personal/home life on work (Figure 29). For example, more than three-quarters of respondents *agree* (somewhat or strongly) that work stress can lead to irritability at home; plans for family

activities are impacted by work duties; and home tasks are neglected because of work duties. In addition, 2-in-3 respondents *agree* (somewhat or strongly) that the demands of work interfere with home and family life.

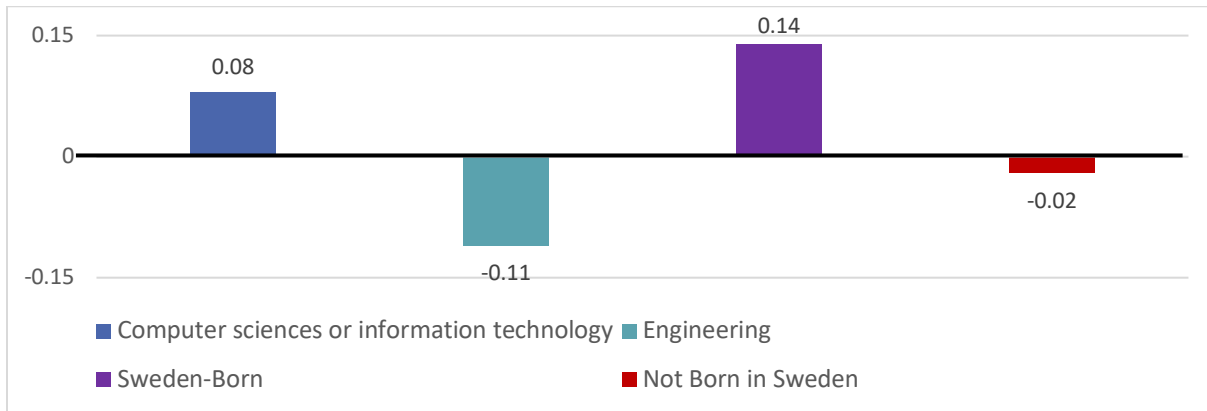
Figure 29: Perceptions of Work and Life Interference



When comparing the perceptions of work and life interference across country of origin, Sweden-born respondents were more likely to *agree* that the demands of work interfere with home and family life compared to respondents born elsewhere (85.2% vs 58.3%). In addition, Sweden-born respondents were more likely to *agree* that the amount of time spent at work makes it difficult to fulfill family responsibilities (61.5% vs. 45.5%), work takes up time to spend with family (72% vs. 60.6%), and that the demands of home and family life interfere with work (53.8% vs. 36.1%). By contrast, more respondents born outside Sweden indicate being able to balance the expectations that their supervisors and families have for them – suggesting more work-life balance (66.7%) compared to Sweden-born respondents (52%).

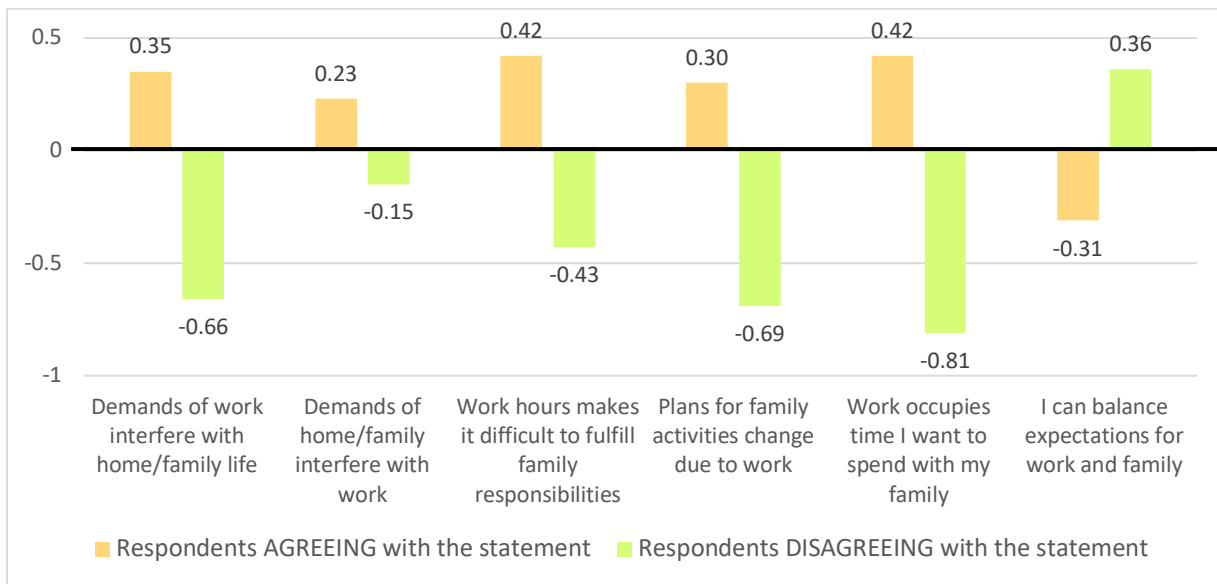
Figure 30 depicts the results of the Work-Life Interference Index based on the individual items outlined in the previous paragraph. Positive scores denote above average experiences of work-life interference, and negative scores indicate below average interference. Sweden-born respondents record the highest score on the index ( $M = .14$ ,  $SD = 1.05$ ). This suggests Sweden-born respondents are more likely to experience work-life interference. Engineering respondents recorded the lowest score ( $M = -.11$ ,  $SD = .98$ ) indicating they experience below average work-life interference compared to these other groups.

Figure 30: Work-Life Interference Index



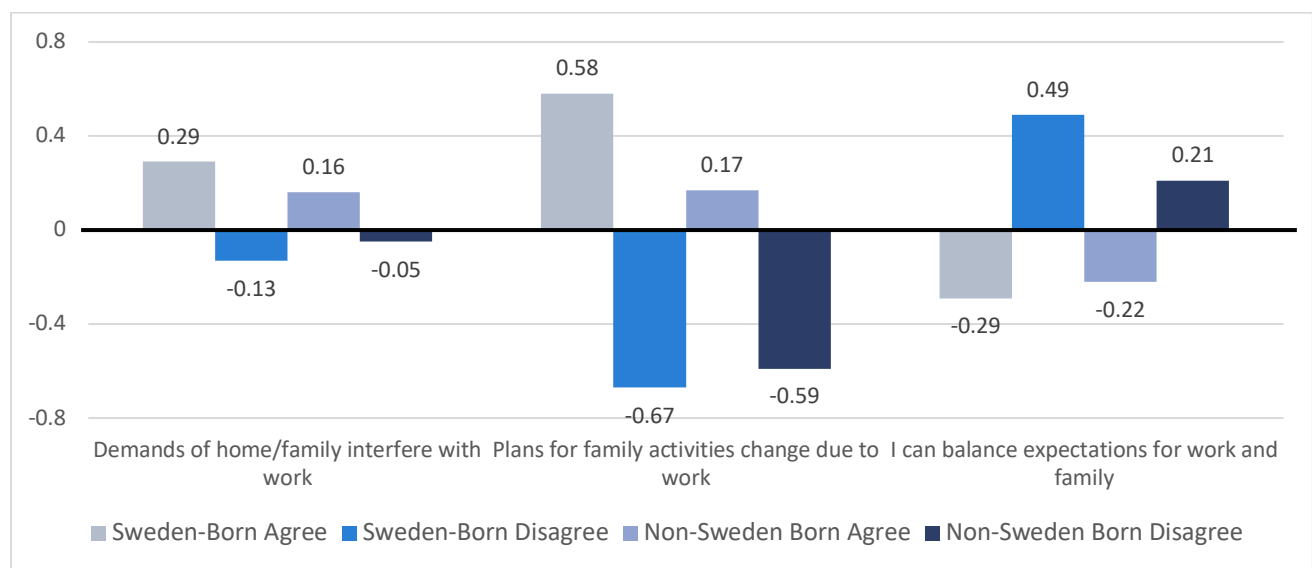
Experiences of the individual work-life interference items were also analyzed with the Emotional Exhaustion Index as an outcome measure. Positive scores on the Index indicate above average emotional exhaustion, and negative scores on the Index indicate below average emotional exhaustion. As illustrated in Figure 31, respondents who *agree* with the statement “work hours make it difficult to fulfill family responsibilities” ( $M = .42$ ,  $SD = 0.79$ ) or “work occupies time I want to spend with my family” ( $M = .42$ ,  $SD = .76$ ) recorded the highest scores compared to respondents who *disagree* to these statements. This suggests that respondents who *agree* to experiencing work-life interference also experience above average emotional exhaustion. By contrast, respondents who *disagree* to these statements have negative scores and experience less emotional exhaustion.

Figure 31: Index of Emotional Exhaustion by Work-Life Interference



Similarly, individual work-life interference items were compared to the Emotional Exhaustion Index to measure the impact of country of origin on work-life balance. As shown in Figure 32, regardless of a respondent's country of origin, those who *agree* to the statements that indicate work-life interference (e.g., “demands of home/family interfere with work” and/or “plans for family activities change due to work”) scored high on the Index and experience above average emotional exhaustion. However, a closer examination reveals that Sweden-born respondents who agree to these statements scored higher than respondents born elsewhere. This suggests that these Sweden-born respondents are more likely to experience emotional exhaustion resulting from work-life interference.

Figure 32: Index of Emotional Exhaustion by Work-Life Interference and Country of Origin



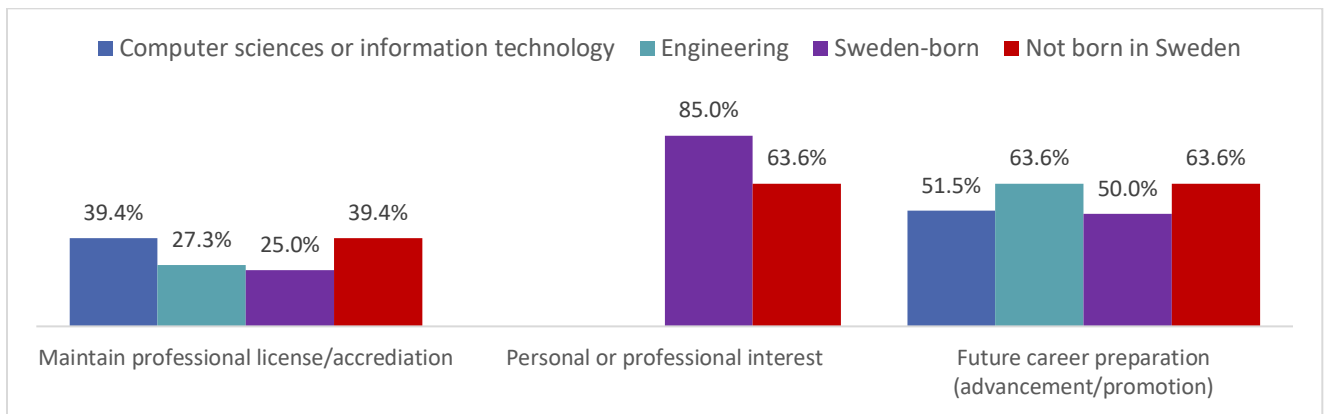
### Training and Professional Development

Overall, 82.6% of respondents indicated they have participated in professional development (PD) and/or training over the past 12 months. Specifically, many respondents have participated in formal PD and training (55.1%); informal activities emphasizing “hard” technical skills (e.g., self-study through journals/book; conference or trade show attendance; technical workshops; or peer study groups, etc.) (60.9%); informal activities emphasizing “soft” skills (e.g., leadership or communication workshops or conferences, etc.) (43.5%); and/or activities specifically designed for women (e.g., women's leadership conference or workshops) (13%).

Respondents who indicated participating in personal development activities and training over the past 12 months were asked follow-up questions regarding their reason/motivation for doing so. The majority indicate participating for personal professional interests (72.7%), preparing for future career advancement/promotion (56.4%), and to maintain professional license/accreditation (34.5%).

As shown in Figure 33, there are some differences in why respondents engage in PD activities and training based on country of origin. For example, respondents born outside of Sweden were more likely to report participating in PD activities and training to maintain license or accreditation, or to prepare for future career advancement or promotion. By contrast Sweden-born respondents primarily participate in PD activities and training for personal or professional interest.

Figure 33: Motivations/Reasons for Participating in Professional Development Activities and Training

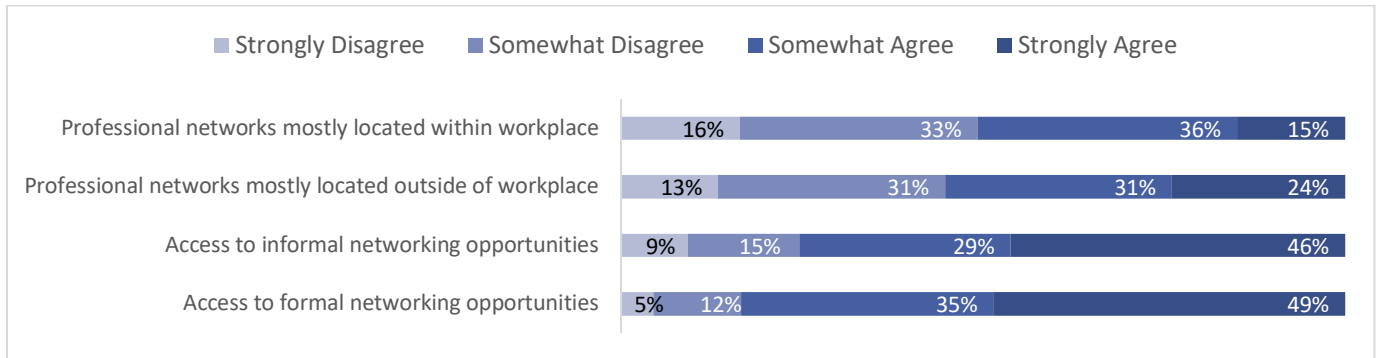


### Networks and Networking

Networks and opportunities for networking are important for career development. As shown in Figure 34, most respondents indicated having had as much access to formal and/or informal networking opportunities within their workplaces as their men colleagues/co-workers. However, over one-half of respondents indicate that their professional networks are mostly located outside of the workplace.

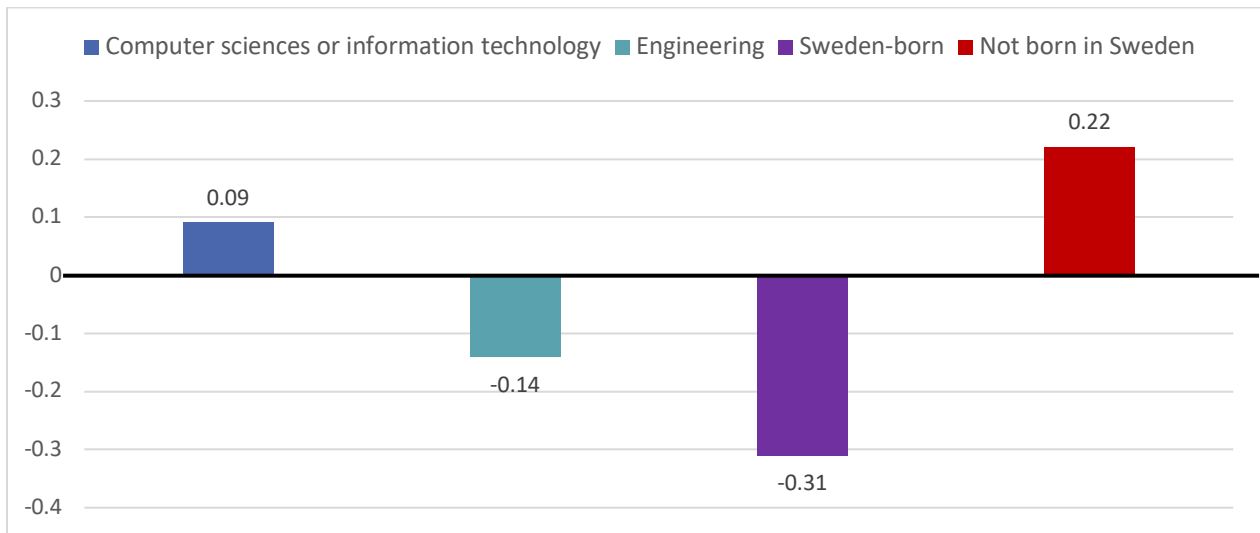
A closer look reveals that networks are gendered. For example, most respondents *agree* that their internal professional networks within the workplace (80.9%), and their external professional networks outside the workplace (69.3%), are primarily composed of men. This is not surprising given that EICT jobs remain heavily male-dominated.

Figure 34: Perceptions on Networking within EICT



We also found that respondents born outside of Sweden were more likely to have gendered internal (86.8%) and external networks (74.3%) compared to Sweden-born respondents (71.4% and 60.7%, respectively). We computed an index to explore trends in gendered networks in more detail. As illustrated in Figure 35, CSIT respondents ( $M = .09$ ,  $SD = 1.08$ ) and/or respondents not born in Sweden ( $M = .22$ ,  $SD = .98$ ) recorded the highest aggregate scores on the Gendered Network Index. This indicates above average gendered networks. By comparison, engineering ( $M = -.14$ ,  $SD = .86$ ) and Sweden-born respondents ( $M = -.31$ ,  $SD = .99$ ) recorded the lowest scores indicating below average gendered networks.

Figure 35: Gendered Networks Index



We asked respondents about their experiences with mentors. Over one-third of respondents indicate that they do not have access to good mentors at their current workplaces (34.6%) or have mentors at their current workplace who are willing to use their influence to help advance their careers (31.8%).

Open-ended comments highlight how mentors could benefit respondents:

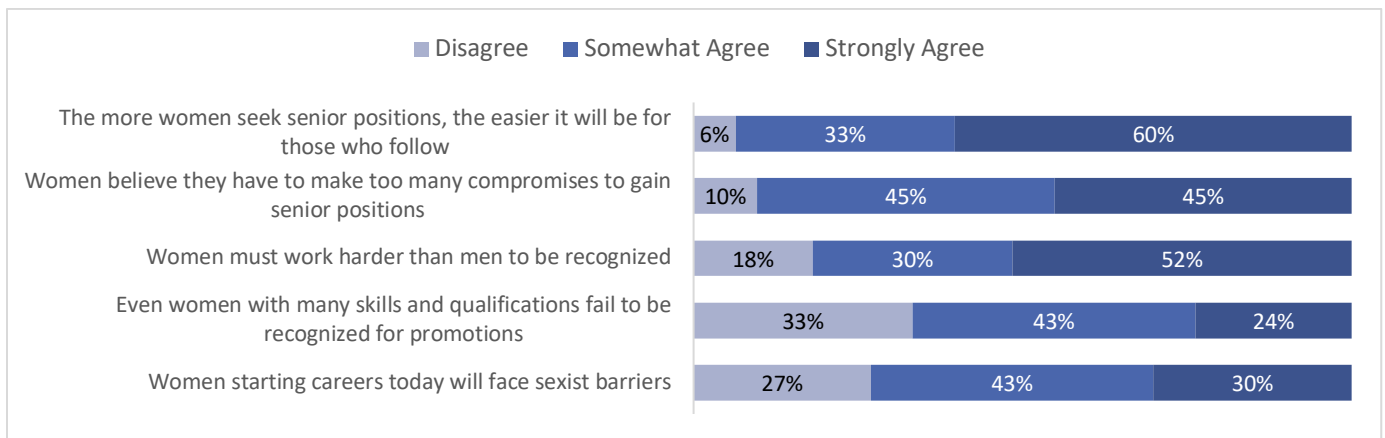
*I wish I had a mentor who could teach me how to apply for external funding. I feel like a massive fraud whenever I'm expected to understand how finances work.*

*There is not a single woman faculty member in my department. It would have been nice to have a woman as a mentor.*

**Perceptions about Women in STEM:**

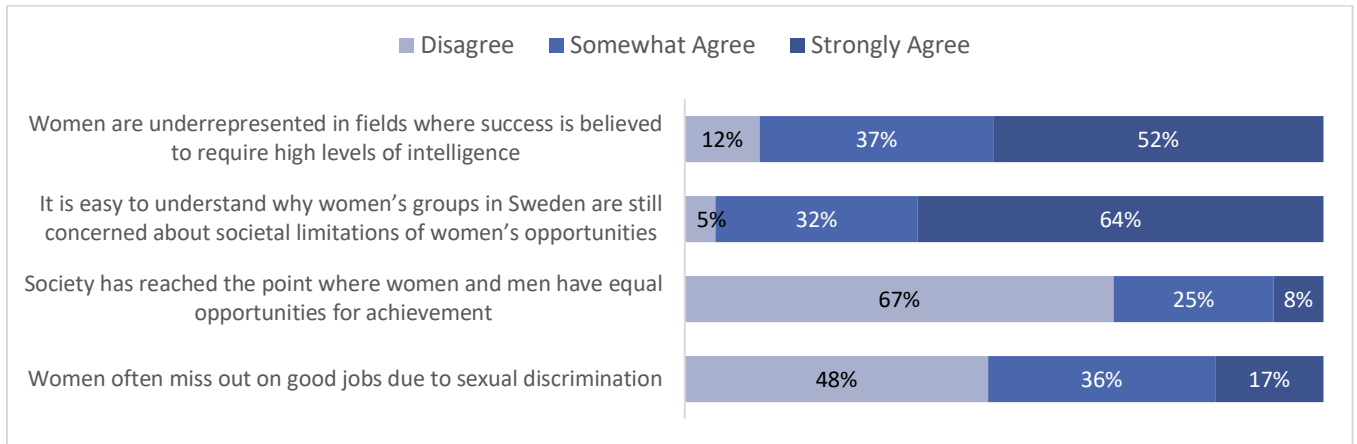
Respondents were asked a series of questions to gauge their perception of women in STEM careers. Figure 36 presents five individual questions asked to respondents. The largest variation in agreement is found with the following statement: “Even women with many skills and qualifications fail to be recognized for promotions”. Overall, the large agreement (strongly or somewhat) to these statements indicate that respondents still perceive gender biases within STEM careers.

*Figure 36: Perception on Women in Stem*



We explore this further by asking respondents a series of questions about women’s experience with gender bias and gender equality on a broader scale. As illustrated in Figure 37, respondents largely perceive the existence of gender bias and inequality within STEM careers. They largely agree that women are underrepresented in fields where success is believed to require high levels of intelligence, and do not believe that society has reached the point where women and men have equal opportunities for achievement.

Figure 37: Perception on Gender Bias and Gender Inequality in STEM



When comparing perceptions of gender bias and inequality by work area, we found engineering respondents were more likely to *agree* that women often miss out on good jobs due to sexual discrimination compared to CSIT respondents (57.7% vs. 48.5%). However, more CSIT respondents (93.9%) *agree* that “women are underrepresented in fields where success is believed to require high levels of intelligence” compared to engineering respondents (81.5%).

Between country of origin, Sweden-born respondents were more likely to perceive women as missing out on good jobs because of sexual discrimination (61.5%) compared to respondents born elsewhere (45.2%). In addition, while most Sweden-born respondents perceive society as having reached the point where men and women have equal opportunities for achievement, only 57.6% of respondents born outside of Sweden shared this same sentiment. This is a difference of over 25 percentage points.

Open-ended comments provide additional insight into gender inequality/equality within STEM:

*Some sides of the issues around gender and females in a male dominated field: A lot of the problems are not possible to point out, they are not obvious or visible but you can "feel" them. The most obvious sign of what I "feel" due to the inequality at work and within my field is the fact that people (especially from the older generation) tend to not be as keen to talk to me as they are to talk to my male colleagues. Other signs that do appear is that colleagues tend to refer to unspecific PhD-students or boss/managers as "him", and refer to unspecific administrative or cleaning staff as "her". It is also more common for colleagues to ask me or other female co-workers for help regarding administrative work than to ask male co-workers. The fact of being a PhD-student, a type of employment with salary but yet not as "normal" types of employments, makes it more difficult to speak up about problems of any kind since you feel that you have gotten an opportunity that you should be grateful for. You may have formal rights for your employment, but they are not obvious or stated for you, and the general view of being a PhD-student is that it is a tough journey as if you are an intern or such with no rights. (Academic).*

*It is difficult to answer questions like “how much is your department taking care of women” when there almost no women in the whole department. I am the only one in my sub-division. (Academic).*

*Many people believe that Sweden is the perfect country when it comes to gender equality, but that only goes for some issues. Sweden does have a good legislation in the area, but there is still so much sexism and discrimination going on, not the least within strongly male dominated areas as for example engineering. I have by now almost 40 years’ experience within the field of computer science/computer engineering. Things are absolutely better than in the 80's but there is still a lot to be done. I should say that maybe the hardest part are those tiny, subtle discriminations that are going on all the time, but are so hard to pin down. (Academic).*

*Most discrimination I have experienced stems from being both female and foreign--so it is hard to be sure which of the two is the basis for the discrimination. Mostly this comes in the form of microaggressions, and is so insidious as to be hard to pin down: is this a misguided attempt at "help" or is the assumption that I am an idiot? While there is extensive support for all employees (male and female) for visible forms of work-life balance (e.g., parental leave), there is no real understanding of the invisible work (e.g. emotional labour, both at home and at work) that women do. My reading is that this is because most of those in leadership positions are still men--and they do not see this work because they so seldom do it themselves, if ever. (Academic).*

*When I (and later, a colleague) was on parental leave, our bosses had different opinions on whether they should inform us of opportunities and news. My boss did, and I appreciated it because I could choose whether I wanted to spend a bit of my time and energy during leave to at least try to put my name in there, to be part of that opportunity after I was back to work. My colleague's boss didn't inform her, arguing that it would be stressful for my colleague and that could affect her, for example, milk supply. Both bosses wanted to be supportive, and I do see the point in both approaches. Perhaps the rule should be to ask the employee which approach they prefer, rather than choosing one for them. (Academic).*

*Younger people are better in this, but software is always a very male dominated area. And often great males are inferior in social life/immature that also affect this area. But there are many other biases in Sweden, also age - what school/education you had etc. (Non-academic).*

#### **Government Policies and Politics:**

We asked respondents a series of questions about government policies. These individual items are presented in Table 2. As indicated, the majority of respondents *agree* to statements that there should be monetary increases for some government benefits or subsidies. There is more disparity over increasing parental benefits with 49% of respondents advocating for at least some increase, and 51% arguing that parental benefits should stay the same or be somewhat reduced.

Table 2: Opinions on Government Benefits/Subsidies

Should there be policies changes in amount of government financial benefits for:	Agree		Disagree
	<i>Significant increase</i>	<i>Somewhat of an increase</i>	<i>Reduce or remain the same</i>
Birth/adoptive leave benefits (e.g., maternity, paternity, and parental)	13.7%	35.3%	51.0%
Child subsidies	11.6%	41.9%	46.5%
Study Allowance (secondary education)	21.3%	55.3%	23.4%
Student Grants	25%	54.2%	20.8%
Student Loans	22.2%	44.4%	33.3%
Sickness Benefits	20.4%	44.4%	35.2%
Unemployment benefits	24.5%	42.9%	32.7%

A closer examination revealed disagreement between CSIT and engineering respondents pertaining to whether there should be policy changes in the amount of government-funded financial benefits for child subsidies. More than one-half of engineering respondents reported that child subsidies should remain the same or be reduced. By comparison, only 40% of CSIT respondents shared this same sentiment.

There were also notable disparities in policy changes by respondents' country of origin. For example, more Sweden-born respondents indicated that parental leave benefits (60%) and/or child subsidies (54.5%) should remain the same or be reduced compared to respondents born elsewhere (42.3% and 38.1%, respectively). In terms of changing the financial benefits offered for student loans - 72% of Sweden-born respondents and 60% of non-Sweden-born respondents indicated student loans should be increased. The majority of respondents indicate that sickness benefits and/or unemployment benefits should be increased either somewhat or significantly. However, more respondents born outside of Sweden compared to Sweden-born respondents

agree for an increase in sickness benefits (73.1% vs. 57.1%) and/or unemployment benefits (77.3% vs. 59.2%).

We also asked respondents whether they think the Swedish government should have provided people with COVID-19 related financial benefits. Overall, 36.4% of respondents agree, 45.5% neither agree or disagree, and the remaining 18.2% disagreed.

Below are some open-ended comments from respondents pertaining to increasing government benefits:

*Considering the delay caused within the health care due to covid-19, it is embarrassing how small the amount is for sick leave. The waiting time was long before covid-19 but got even longer during and after covid-19, hence delaying the recover from sick leave and therefore requiring longer time off paid sick leave which is financed by our taxes. It is unreasonable that treatments necessary for returning to work can be postponed for months. One month of full-time sick leave for me pays around \$16,000kr after taxes for me, but it probably also generates less taxes paid by me and my employer leading to more "costs" for the society. How many months of sick-leave is relevant instead of using the money to provide the care and treatment needed? (Academic).*

*In Sweden, I think there should be more support in high schools, where students choose the direction of their future studies. Also, the work to promote women should continue, including education to both men and women about discrimination and gender issues. (Academic).*

*You do not ask about benefits related to taking care of older parents. You do not get anything for that in Sweden and it is a real burden if it hits you. (Academic).*

#### Conclusion:

Globally, women continue to be underrepresented in science, technology, engineering, and mathematic (STEM) fields. This research highlights factors that contribute to the retention and attrition rates of women working in engineering and information and communication technology (EICT) jobs in Sweden.

The primary objective of this study is to identify the impact of welfare state entitlements, job factors, and family/individual circumstances on women's intent to stay or leave their jobs. Our findings suggest that a lack of permanent positions and other job-related factors such as dissatisfaction with salary, few promotion opportunities, and hostile climate have the biggest impact on job attrition. Thus, more permanent positions that offer job stability/security, good pay, and supportive colleagues/co-workers and management/leadership may support job retention. Respondents also indicate wanting to see increases to government benefits and subsidies especially for study allowance, student grants, student loans, sickness benefits, and

unemployment benefits. There is less support for increasing child-related benefits or parental leave.

Another objective of this study is to evaluate the impact and variation of these circumstances by employment sector and work type. We directly compared the experiences of women working in engineering to computer science and information technology (CSIT), as well as women working in the academic sector to the non-academic sector (when applicable). We were also able to compare the experiences of Sweden-born respondents to respondents born in other countries.

Our findings indicate that broadly, there appears to be greater job retention within engineering. More CSIT respondents indicate plans to change jobs compared to engineering respondents despite CSIT respondents expressing more career satisfaction and less workplace alienation (in the form of powerlessness and self-estrangement). However, CSIT appears to be less supportive of women compared to engineering. For example, CSIT respondents were more likely to report experiencing gender stereotyping, exclusion, lack of support, and more work-life interference.

We also find that respondents born in Sweden have more career satisfaction and less workplace alienation compared to respondents born elsewhere. There appears to be greater turnover intention among respondents born outside of Sweden. However, Sweden-born respondents indicate more exhaustion in the form of “feeling used up at the end of the workday”, more work-life interference, and are more pessimistic about their workplace’s commitments to gender equity and support/inclusion.

These findings have raised important questions which we intend to investigate further in the qualitative phase of the project. In sum, we seek to further understand why intentions to leave are greater for CSIT respondents despite more career satisfaction and less workplace alienation. In addition, we seek to understand why there is less support for gender equity within CSIT despite improvements within engineering. Moreover, the differences in working experiences of respondents born outside of Sweden compared to Sweden-born highlight the need to take an intersectional approach to understanding women’s working experiences within EICT in Sweden. Interviewing women with additional minoritized identities may offer more nuanced understanding of current barriers and challenges.

To conclude, this report outlines the findings from a Sweden-wide survey on women working within EICT fields. In the future, we will compare these results to similar surveys administered in Canada and Germany to uncover potential similarities and differences in job attrition and retention. Overall, the statistical analysis demonstrates that, despite increased efforts to improve gender equity across STEM fields, gender inequalities, stereotypes, and biases remain problems within EICT in Sweden, shaping women’s day to day workplace experiences across employment sectors.