

Why so Few? The Relationship of Work-Life Balance And Stereotype
Threat With Job Satisfaction And Turnover Intention in Female
STEM Employees Moderated by Professional Self-Efficacy

Master's thesis

Work, Organization & Health Psychology

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Number of words: 5997

Date: 10.08.2020

Management Summary

Theoretical background

The company for which this research was conducted experiences a large gender gap in their STEM workforce. In this research, it was focused on what contributes to female STEM employees' job satisfaction and turnover intention. The potential predictors work-life balance and stereotype threat were further investigated. For instance, Watanabe (2010) hypothesized that women might feel the need to prove themselves, putting more emphasis on their work role, potentially leading to a work-life conflict. This conflict can lead to decreased job satisfaction and increased likelihood of turnover (Glass & Estes, 1997).

Also, as an underrepresented group in the STEM sector, females are more prone to experience stereotype threat which has been shown to severely affect employees' job satisfaction as well as their turnover intention (Saks, 2006). Additionally, the potentially moderating role of professional self-efficacy is investigated. Knowing that one can handle upcoming tasks at work could function as a bolster when a stressor comes up at work (Chan et al., 2017).

Therefore, the aim is to investigate the relationship between the predictors work-life balance and stereotype threat and the criteria job satisfaction and turnover intention. Moreover, the moderating role of professional self-efficacy is investigated. The goal is to derive interventions targeted at improving job satisfaction and lowering turnover intention in female employees in order to diversify the workforce.

Method

To investigate the research question, a 47-item online questionnaire assessing job satisfaction, turnover intention, work-life balance, stereotype threat and professional self-efficacy was spread amongst STEM employees. In total, 77 female subjects were included in the final analyses.

Results

The results of the present study show that there was no significant relationship between the variables work-life balance and stereotype threat and job satisfaction. Also, no significant effects were found for the relationship between the variables work-life balance and stereotype threat and turnover intention. Professional self-efficacy was no moderator in these relationships but has been found to have a direct positive effect on job satisfaction.

Discussion

Intended to contribute to the closure of the gender gap in STEM occupations, the current study was one of the first to examine the impact of several predictors on job satisfaction and turnover intention in female STEM employees and the potentially moderating effects of professional self-efficacy. Results suggest that professional self-efficacy is related to job satisfaction. Therefore, interventions to improve the job satisfaction in this group should target professional self-efficacy.

For instance, companies could offer programs that teach managers to focus on the three main sources of self-efficacy when wanting to raise their employees' professional self-efficacy. First, there is enactive mastery which can be improved by counting on successes on challenging tasks and slowly increasing the complexity of tasks. Second, there is role-modelling which can be achieved by assigning a mentor to the employee from whom he or she can learn. Lastly, professional self-efficacy can be improved by making use of verbal persuasion, praising an employee for doing a good job and offering more challenging jobs in the future as a recognition of the employee's skills.

Abstract

Although media and research stress the importance of closing the gender gap in the male-dominated field of STEM, little is known about the reasons why there are so few women working in a STEM-related job. The present study focused on identifying predictors (work-life balance & stereotype threat) of job satisfaction and turnover intention in female STEM employees and whether professional self-efficacy (PSE) potentially moderates the relationship between the predictors and the dependent variables. Work-life balance and stereotype threat were neither related to job satisfaction nor turnover intention and PSE was not found to be a moderator between these variables. However, PSE was found to have a direct, positive effect on job satisfaction. The current study does not only contribute to what is known to impact female STEM employees' job satisfaction and turnover intention but also gives valuable practical implications on how companies can improve their employees' job satisfaction.

Keywords: job satisfaction, turnover intention, female STEM employees, work-life balance, stereotype threat, professional self-efficacy

Gender inequalities in typically male or female jobs are no new phenomenon but have been a topic of concern for a long time now. One of the fields in which gender inequality is a serious and growing problem is the field of STEM. STEM is the acronym for all jobs that are related to science, technology, engineering and mathematics and is dominated by males all over the world (Wood, 2020). In Germany, the problem of an unequal STEM workforce is especially prevalent. According to statistics of the German labour agency (GLA) (2019), only 15.8% of STEM employees are female. There are two main reasons for this. First, there is a high demand for STEM specialists and according to statistics of the GLA (2019), more will be needed in the future. Getting more women into the talent pool could be part of the solution to the problem of having not enough specialists in this field and could help to diversify it altogether. The company for which the present study is conducted is dealing with a large imbalance between the number of male and female employees in the typical STEM-related jobs. However, the company puts great emphasis on equality and diversity and is eager to get to know more about what causes the gender gap in their STEM workforce and how to tackle this issue.

First, the STEM field could benefit enormously from a diversified workforce that includes employees that differ on variables like gender and culture for example (Saxena, 2014). Research has shown that diverse teams are more creative, produce more innovations

(Roberge & van Dick, 2010) and are better able to flexibly adjust to change, providing a competitive advantage for the company (Cox and Blake, 1991). Considering the numerous advantages of an equal workforce for companies as well as the cry for more female STEM employees in the media (Gressler, 2019), it is important to find ways to improve diversity. Still, one should first be aware of what causes an unequal workforce and in the case of STEM related jobs, the reasons for this inequality might even start in high school.

According to research, self-efficacy beliefs of children have great impact on their further career development (Feldt & Woelfel, 2009). According to the social cognitive theory, self-efficacy is defined as people's belief in their capabilities and skills, which in turn is central to their motivation to either seek or avoid a given task or challenge (Bandura, 1997). In a report by the American Association of University Women (1991), it has been revealed that girls' confidence in their academic skills drops dramatically when they transition from elementary to high school. This drop is particularly visible in their belief in their science and math skills. Sadker and Sadker (1994) call this the "confidence gap" which is for a large part responsible for the gender gap in STEM careers (Eccles, 1994; Makarova, Aeschlimann, & Herzog, 2019). This might be because self-efficacy beliefs influence the choice of goals and the level of persistence if difficulties come up during the pursuit of these goals (Bandura, 1997). Therefore, girls are first less likely to pursue a STEM career if their self-efficacy regarding STEM related topics is low and second, are more likely to give up on their goal to pursue a STEM career if difficulties come up (Rittmayer & Beier, 2008).

The STEM field can be described as an unequal, male-dominated work field. However, taking a look at a statistic of university freshmen pursuing a degree in one of the STEM fields, the gender gap is much smaller. In 2018, 33% of all STEM freshmen at German universities were female (Statista, 2020). This indicates that a large number of female STEM professionals are lost somewhere in between. Either during their studies, during the transition between earning a degree and finding a job or because they quit their jobs.

Therefore, some of the main causes of the gender gap in STEM occupations could be found by looking at how women feel about their jobs (job satisfaction) and what might cause them to leave their organization (turnover intention). Identifying variables that might have a negative influence on these factors could help companies to improve their strategies to retain female employees and thereby diversify their workforce altogether. In this research, the potential predictors work-life balance and stereotype threat were chosen to be further investigated not because they are unique for female employees but because females put

special emphasis on these factors due to various reasons. These reasons will be discussed in more detail in the following paragraphs. Also, because peoples' level of self-efficacy has been shown to have an effect on whether or not people stick to what they are doing when facing difficulties such as facing stereotypes or experiencing work-life imbalance (Rittmayer & Beier, 2008), its potential moderating role will be discussed.

Work-life balance

One of the most important challenges of employees is to keep a good work-life balance. Greenhaus, Collins, and Shaw (2003) define this balance as "the extent to which an individual is equally engaged in – and equally satisfied with – his or her work role and family role". While technology enables employees to be available 24/7, the borders between work life and private life become blurred, resulting in role spill-over (Glass & Estes, 1997; Sok, Blomme, & Tromp, 2014). Role spill-over can take two forms. Either family-to-work spill-over or work-to-family spill-over. While the former one often results in decreased productivity and higher absenteeism at work, the latter one could potentially lead to an impaired family functioning (Glass & Estes, 1997).

It has been shown that keeping a healthy work-life balance is especially difficult for women in STEM occupations. In her study, Kanter (1977) has found that individuals of underrepresented groups are highly visible in the workplace and are aware of that. Watanabe (2010) hypothesized that this leads women to feel the need to prove themselves as equal members of the workforce and to put more emphasis on their work role. According to Glass and Estes (1997), this imbalance leads to decreased job satisfaction and higher turnover to better accommodate family demands. Based on this, the following hypotheses are formed.

H1: Work-life balance is positively associated with job satisfaction.

It is expected, that people who score high on work-life balance, will also score high on job satisfaction.

H2: Work-life balance is negatively related to turnover intention.

It is further expected, that those who score high on work-life balance will score lower on turnover intention and thus be less likely to look for a different job in the future.

However, the direct effects of work-life balance on job satisfaction and turnover intention could be moderated by another variable. Self-efficacy influences whether or not people strive towards a goal or give up when they think that their abilities do not match the demands (Rittmayer & Beier, 2008). Still, it should be noted that people's self-efficacy varies depending on the context (Bandura, 2001). Therefore, when examining employees' self-

efficacy concerning their work, it is important to take a look at their professional self-efficacy (PSE) instead of their self-efficacy in general. PSE is defined as the belief that one is capable of successfully performing ones' job (Chan et al., 2017). In their research, Chan et al. (2017) propose an interesting theory which has not yet been further investigated. Drawing on the social cognitive theory (Bandura, 2001), they hypothesized that when employees have to handle several demands such as very high demands at work and having to balance work and family life at once, PSE could moderate the effects of these demands on another outcome variable such as job satisfaction and turnover intention by working as a bolster. Therefore, the following hypotheses are formed.

H3: PSE moderates the positive relationship between work-life balance and job satisfaction.

It is expected that when people score low on work-life balance but high on PSE, their job satisfaction will not be as badly affected by their low work-life balance. Thus, in this case, the relationship between work-life balance and job satisfaction will be weaker.

H4: PSE moderates the negative relationship between work-life balance and turnover intention.

Therefore, it is expected that when people score low on work-life balance but high on PSE, PSE can bolster the negative effects of low work-life balance on turnover intention. Hence, the relationship between the both will be weaker.

Stereotype threat

Although companies try to become more diverse, stereotypes concerning women's abilities remain and are especially prevalent in male-dominated fields. Studies have shown that in these fields, women have less development opportunities and continue to earn less than men (Lyness & Heilman, 2006). Also, working in a male-dominated field makes women prone to face a psychological threat, also referred to as stereotype threat, of confirming negative stereotypes or being judged on them (Steele, Spencer, & Aronson, 2002). Saks (2006) has shown that this can lead to decreased job satisfaction and higher turnover intention in populations other than STEM employees. Again, considering the need for more women in STEM jobs, assessing their degree of stereotype threat and the possible influence on their job satisfaction and turnover intention could help to improve strategies aimed at retaining them in the field. Based on research by Saks (2006), the following hypotheses are formed.

H5: Stereotype threat is negatively related to job satisfaction.

This means that those who score high on stereotype threat score lower on job satisfaction.

H6: Stereotype threat is positively related to turnover intention.

It is expected that those who score high on stereotype threat will also score high on turnover intention.

A potential moderator in these relationships could be PSE. Having trust in ones' own ability to perform ones' job could possibly weaken the effect of stereotype threat on job satisfaction and turnover intention. Supporting these expectations, Milner and Hoy (2003) have found that even in a stereotype-driven environment, self-efficacy can boost persistence. Furthermore, as Chan et al. (2017) have proposed, PSE might work as a bolster between several hardships and job satisfaction as well as turnover intention. Hence, the following hypotheses are made.

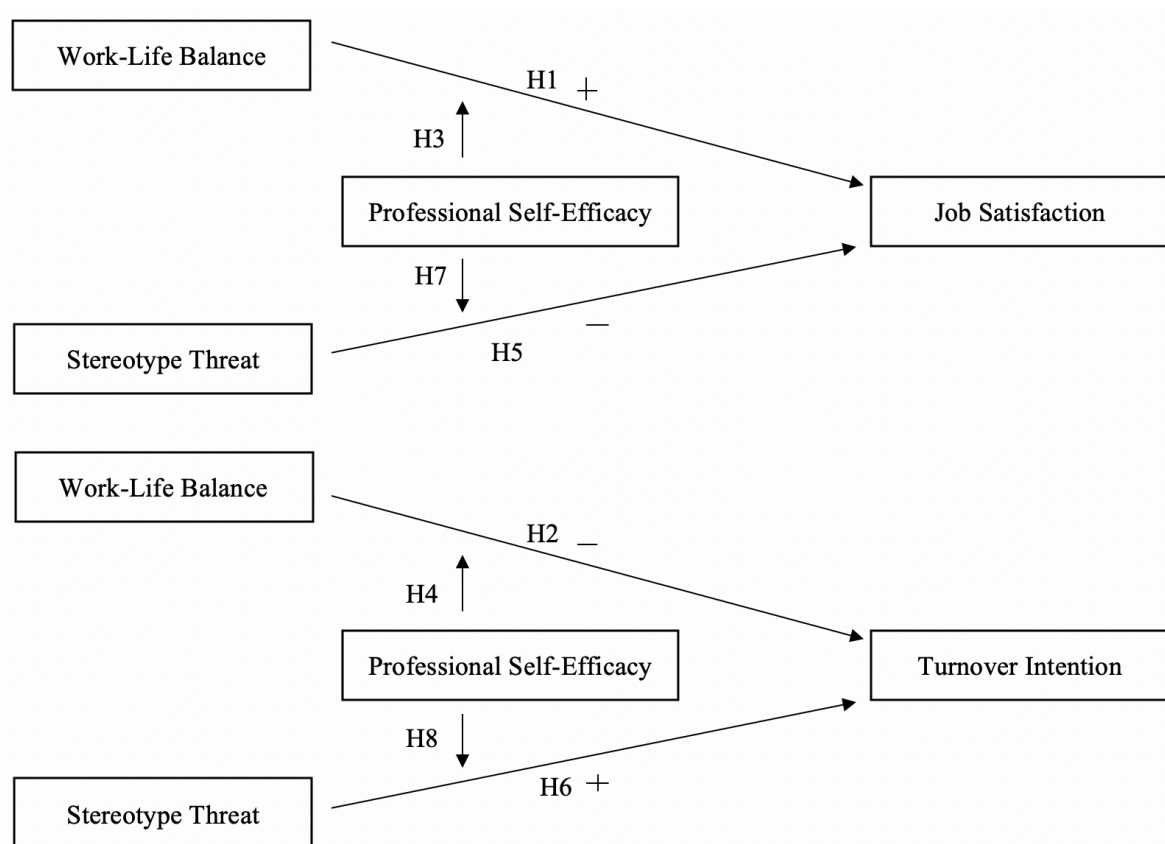
H7: PSE moderates the negative relationship between stereotype threat and job satisfaction.

To be more specific, it is expected that the negative effects of stereotype threat will have less effect on people's job satisfaction if they score high on PSE. However, if their PSE is low, the relationship between stereotype threat and job satisfaction is expected to be stronger.

H8: PSE moderates the positive relationship between stereotype threat and turnover intention.

It is expected that when people score high on PSE, the positive relationship between stereotype threat and turnover intention will be weaker. In contrast, if they score low on PSE and high on stereotype threat, the relationship between stereotype threat and turnover intention will be stronger. The proposed model including all hypotheses and relationships can be found in Figure 1.

The aim of the present study is to expand current research on female STEM employees regarding the factors that influence their job satisfaction and turnover intention. In this specific study, it is examined whether work-life balance and stereotype threat are related to job satisfaction and turnover intention and whether PSE moderates these relationships. The goal of this research is to help enable companies to create strategies aimed at retaining female STEM employees to ultimately contribute to reducing the gender gap in STEM occupations.

Figure 1*Research model and hypotheses*

Note. In this figure, the hypotheses and expected relations between the study variables are depicted. A + sign signifies a positive relation whereas a – signifies a negative one.

Methods

Participants

To assess how many subjects are needed, an a priori power analysis was conducted in G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). The power analysis revealed a minimum required sample size of 94 participants for a power of 0.8 at an alpha of 0.05 when expecting a medium effect size ($f^2 = .50$).

In total, data of 105 participants was collected by sharing the link to the questionnaire on social media platforms as well as by spreading it via email. Male and female employees that are currently working in one of the typical STEM were asked to take part in the study. This sampling method is also known as convenience sampling. However, 26 participants did not finish the questionnaire. Of the remaining 79 subjects, one subject indicated to be male and was removed from the data. After excluding these subjects and deleting one outlier from the data, the data of 77 participants was used to run the final analysis. The participants' age

ranges from 18 to 59. The exact frequencies of the age groups can be found in Table 1. For their voluntary participation, the subjects did not receive any compensation or reward.

It is noteworthy that it was chosen to delete the only male participant from the data and focus on female participants only. Only 12 men participated and only one single male subject filled in the questionnaire completely. Because the main focus of the study was to investigate which factors predict job satisfaction and turnover intention in an underrepresented group, it was chosen to run the analysis with female participants only. This is because it was considered to be more important to get valid and reliable results which would not have been possible with such a small comparison group.

Table 1

Frequency table of age groups

Age group	<i>N</i>
18-24	2
25-40	67
41-59	8
Total	77

Procedure

The study was conducted with the online questionnaire tool Qualtrics and participants were able to complete the study on their own web-enabled devices. First, participants got to read an information letter containing general information about the study, such as the goal of the research. They were informed about the fact that the study is completely voluntary and that they could quit at any moment without any consequences. Then, they were asked to sign an informed consent form including information about their guaranteed anonymity. Next, participants were asked to answer demographic questions concerning their gender, age, the country they work in, their work schedule (full-time/part-time) and whether they currently hold a STEM-related position. After that, there were five short questionnaires to be answered. First, participants were asked to answer questions regarding their job satisfaction. Next, they were asked about their work-life balance, their PSE, their turnover intention and lastly, they were asked to answer questions concerning stereotype threat. Finally, participants were debriefed and thanked for their participation. They did not receive an incentive for taking part

in the research. In total, the study took about 15 minutes to complete. All forms and questionnaires can be found in the appendix.

Material

Job satisfaction was measured by using the 20-item short-form Minnesota Satisfaction Questionnaire (MSQ) (Weiss, Dawis, England, & Lofquist, 1967). Items were rated on a 5-point Likert scale (1 = *very dissatisfied* to 5 = *very satisfied*). The final score was calculated by computing a mean score from all items. A high mean score is indicative of high job satisfaction. An example item of the questionnaire is: “The chance to do something that makes use of my abilities.”. Welbourne, Eggerth, Hartley, Andrew, and Sanchez (2007) have found an internal consistency of .92 for the MSQ. In the present study, an internal consistency of .82 was observed which is still classified as good (Gliem & Gliem, 2003).

Turnover intention was measured by using a 3-item scale that is part of the Michigan Organizational Assessment Questionnaire (Cummann, Fichmann, Jenkins, & Klesh, 1979). The scale has been adapted to a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*) by Jonathan, Thibeli, and Darroux (2013) who have found an internal consistency of .86 in their study. The final score was calculated by computing a mean score from all items. A high mean score is indicative of a high intention to leave. An example item of the questionnaire is: “I will likely actively look for a new job in the next year”. In this study, an internal consistency of .92 was found which is classified as excellent (Gliem & Gliem, 2003).

Work-life balance was assessed by using a 4-item scale that was developed by Brough et al. (2009). In their study, they have found an internal consistency ranging from .84 to .94. The items were rated on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). The final score was calculated by computing a mean score from all items. A high mean score is indicative of a good work-life balance. An example item of the questionnaire is: “I have difficulty balancing my work and non-work activities”. A Cronbach’s alpha of .92 was found in the present study, which is indicative of an excellent internal consistency (Gliem & Gliem, 2003).

PSE was measured by using the 10-item general perceived self-efficacy questionnaire (Schwarzer & Scholz, 2000) and rewording it to match the work context. For example, “I can always manage to solve difficult problems if I try hard enough” was reworded into “At work, I can always manage to solve difficult problems if I try hard enough”. Items were rated on a 4-point Likert scale (1 = *not at all true* to 4 = *exactly true*). The final score was calculated by computing a mean score from all items. A high mean score is indicative of high PSE. After

rewording the general perceived self-efficacy questionnaire to match the work context, Ventura, Salanova, and Llorens (2015) have found an internal consistency ranging between .83 and .93. In the present study, an internal consistency of .84 was found which is classified as good (Gliem & Gliem, 2003).

Stereotype threat was measured by using von Hippel, Issa, Ma and Stoeke's (2011) 10-item version of Steele and Aronson's (1995) original measure of stereotype threat among African American students. After adjusting it to match working women, they have found a Cronbach's alpha of .90. Again, the final score was calculated by computing a mean score score. A high mean score is indicative of high experienced stereotype threat. An example item of the questionnaire is: "I have less ability because I'm a woman" and items were rated on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). Additionally, the questionnaire got reworded to also match male participants (e.g. "I have less ability because I'm a man"). In this study, a Cronbach's alpha of .90 was found, which is classified as excellent internal consistency (Gliem & Gliem, 2003).

Data analysis

The study consisted of quantitative variables only and was correlational in its nature. There were two dependent quantitative variables (job satisfaction and turnover intention), one quantitative moderator (PSE) and two independent quantitative variables (work-life balance and stereotype threat).

Beforehand, missing values were identified and the scores of item two of the work-life balance questionnaire were reversed. Next, the scores of for each variable were computed by adding each variable's individual items and computing a mean score from them. After computing the mean scores for all variables, the minimum total score for all variables was one, whereas the maximum total scores differed. For job satisfaction, turnover intention and work-life balance, the maximum total score was five, for stereotype threat it was seven and for PSE it was four. By using boxplots, one outlier was identified and removed from the data. To avoid high multicollinearity, the scores of all predictors were centered. The interaction terms were computed by multiplying the centered predictors with the centered moderator. Then, the descriptive statistics and correlations were computed. To detect possible confounders, correlations of the demographic variables age and work schedule were checked but since none of the variables correlated with both a criterion and a predictor they were not added to the final analysis.

Also, before running the analysis, the data was screened to rule out any violation of assumptions. Regarding the analysis including the dependent variable job satisfaction, linearity, normality and homoscedasticity was guaranteed and no multicollinearity was present. For the analysis including the dependent variable turnover intention, only the assumption of normality was violated. Because neither log transformation nor square root transformation corrected the distribution, bias corrected accelerated (BCa) bootstrapping was included in the analysis of the variable turnover intention. This was to avoid invalid significant tests, as BCa does not rely on the assumption of normality (Kelley, 2005).

To analyze the data, two multiple regression analyses were performed in IBM SPSS 26, one for each dependent variable. For both analyses, work-life balance, stereotype threat, PSE and the interaction terms between work-life balance and PSE as well as between stereotype threat and PSE were entered as predictor variables. For the first analysis, job satisfaction was chosen as the criterion whereas for the second analysis, turnover intention was chosen as criterion.

Results

Descriptive statistics

In Table 2, an overview of the descriptive statistics as well as the correlations before centering the predictors can be found. Regarding the independent variables job satisfaction and turnover intention, the mean lies between the answer categories *neutral* to *satisfied* and *disagree* to *neutral* respectively. For work-life balance, the mean lies between the answer categories *neutral* to *agree*. Considering stereotype threat the mean refers to *slightly disagree* and for PSE, the mean refers to answer category *moderately true*. The correlations show that job satisfaction significantly correlates with turnover intention, stereotype threat and PSE. According Cohen's (1988) conventions to interpret effect sizes, the correlation between turnover intention and job satisfaction is negative and moderate ($r = -.34, p = .001$) whereas the correlation between PSE and job satisfaction is large and positive ($r = .51, p < .001$). Also, stereotype threat correlates weakly and positively with job satisfaction ($r = -.21, p = .04$). Job satisfaction did not significantly correlate with work-life balance ($r = .15$). Of the demographic variables, age correlated weakly and negatively with job satisfaction ($r = -.20, p = .04$) but did not correlate with any of the predictor variables. The subjects' work-schedule did not significantly correlate with job satisfaction ($r = .38$). Therefore, age and work-schedule were no confounding variables in this analysis. Moreover, turnover intention did not significantly correlate with age ($r = -.15$), work-schedule ($r = -.16$), stereotype threat

($r = .05$), work-life balance ($r = -.08$) or PSE ($r = -.12$).

Table 2

Descriptive Statistics and Correlations

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Age			—						
2. Work-schedule			-.09	—					
3. Job Satisfaction	3.75	.41	-.20*	.03	—				
4. Turnover Intention	2.55	1.24	-.15	-.16	-.34**	—			
5. Work-life Balance	3.42	.87	.14	.10	.15	-.08	—		
6. Stereotype Threat	2.91	1.26	-.11	-.04	-.21*	.05	-.19*	—	
7. Professional self-efficacy	3.25	.39	-.14	-.01	.51**	-.12	.11	-.32	—

Note. * $p < .05$. ** $p < .01$.

Main Analysis For Job Satisfaction

A multiple regression analysis was performed to assess whether work-life balance predicts job satisfaction positively and whether stereotype threat relates negatively to job satisfaction. Also, it was tested whether PSE moderates the relationship between the predictors and job satisfaction. An overview of the results can be found in Table 3.

The overall model was significant ($F(5,71) = 6.22, p < .001$) and according to standards set by Cohen (1988), the proportion of explained variance ($R^2 = .304$) is moderate. This means that 30.4% of the variance of job satisfaction is explained by the independent variables. Only the regression coefficient of the PSE ($b = .52$) was significant ($t(71) = 4.64, p = <.001$). This signifies that PSE is positively related to job satisfaction. Hence, the higher a subject scores on PSE, the higher the subject will score on job satisfaction. For the independent variables work-life balance ($b = .05$) and stereotype threat ($b = -.001$), the regression coefficients were not significant (respectively $t(71) = .97, p = .33$; $t(71) = -.02, p =$

.98). Hence, neither work-life balance nor stereotype threat are significantly related to job satisfaction, signifying that experiencing work-life balance or stereotype threat does not affect people's job satisfaction. Therefore, hypotheses one and five got denied. Furthermore, the regression coefficients of the interaction terms between PSE and work-life balance ($b = -.13$) as well as between PSE and stereotype threat ($b = .11$) were not significant (respectively $t(71) = -.90, p = .37$; $t(71) = 1.00, p = .32$). In conclusion, this means that hypotheses three and seven are not supported by the results. PSE is not a moderator in the relation between work-life balance and job satisfaction nor in the relation between stereotype threat and work life.

Table 3

Multiple Regression Analysis for Job Satisfaction

Effect	<i>b</i>	<i>SE</i>	β	<i>p</i>
Constant	3.76	.04		<.001
Work-life balance	.05	.05	.10	.33
Stereotype Threat	-.00	.04	-.00	.98
Professional self-efficacy (PSE)	.52	.011	.49	<.001
PSE*Work-life Balance	-.13	.14	-.10	.37
PSE*Stereotype Threat	.11	.11	.12	.32

Main Analysis For Turnover Intention

A multiple regression analysis was performed to assess whether work-life balance predicts turnover intention negatively and whether stereotype threat relates positively turnover intention. Also, it was tested whether PSE moderates the relationship between the predictors and turnover intention.

The overall model was non-significant ($F(5,71) = .63, p = .70$), meaning that none of the independent variables predict turnover intention. Additionally, PSE is no moderator in the relation between the predictors and turnover intention. In conclusion, the results do not confirm hypotheses two, four, six and eight.

Discussion

In the present study, it was investigated whether work-life balance and stereotype threat are predictors of job satisfaction and turnover intention in female STEM employees. Moreover, it was also investigated whether professional self-efficacy (PSE) moderates the relationship between the predictors and the dependent variables. Although not included in the initial hypotheses, only PSE positively predicted job satisfaction. Work-life balance and stereotype threat on the other hand were no predictors job satisfaction, meaning that there is no evidence for hypothesis one and five. Furthermore, PSE was not found to be a moderator in the relation between the predictors and the criterion, meaning that hypotheses three and seven also got denied. The model proposed for turnover intention did not apply. Neither work-life balance nor stereotype threat predicted turnover intention and PSE did not work as a moderator. In consequence, hypothesis two, four, six and eight got denied. In conclusion, the present study did not find support for any of the previously stated hypotheses. Consequently, the answer to the research question is that work-life balance and stereotype threat are not related to job satisfaction and turnover intention and that PSE does not moderate any of the initially suggested relationships.

The finding that there is a positive relationship between the PSE and job satisfaction is in line with previous research. For example, Judge and Bono (2001) have shown that self-efficacy is positively related to job satisfaction and Rigotti, Schyns & Mohr (2008) have expanded these findings by particularly focusing on PSE and its relation to job satisfaction. In their research, a positive relationship between the two variables was established. Similar results have been found by studies focusing on other fields. De Simone, Planta, and Cigotto (2018) have found that nurses who believe that they are able to successfully master whatever comes up at work were more satisfied with their job. The current study expands the existing literature on the relationship between PSE and job satisfaction by suggesting that these findings also apply to female STEM employees.

Inconsistent with prior research, work-life balance did neither relate to job satisfaction nor turnover intention. Based on previous studies, it was expected that work-life balance would be an important predictor in these relationships, especially for the specific sample that has been studied (Watanabe, 2010; Glass & Estes, 1997). However, participants' answers on the work-life balance scale were rather centered and referring to answer categories *neutral* to *agree*, which indicates that overall, the majority of them is satisfied with their work-life balance or at least do not experience a severe imbalance. It is imaginable that due to this and the missing association between work-life balance, job satisfaction and turnover intention, no

significant moderation effect of PSE could be found. In prior research, the relationship between work-life balance and the criteria job satisfaction and turnover intention was repeatedly documented (Sang, Ison, & Dainty, 2009; Deery & Jago, 2015). Still, it is very important to mention the circumstances under which the present study was conducted and consider how these circumstances set the current research apart from all other studies. During data collection, employees were facing the effects of a global pandemic due to Covid-19. People were and are still dealing with the consequences of it, facing short-time work, salary cuts and job insecurity next to social distancing and severe cuts to their daily lives (Koschik, 2020). Therefore, it is likely that people put less emphasis on work-life balance and are much more concerned about their job security and future for instance.

The finding that stereotype threat is neither related to job satisfaction nor turnover intention is not in line with previous research. The studied sample is part of a highly underrepresented group which is prone to face stereotype threat (Steele et al., 2002) which has been shown to negatively affect job satisfaction and promote turnover intention (Saks, 2006). However, this relationship could not be replicated in the present research. Similarly, PSE was not found to be a moderator between stereotype threat and the dependent variables job satisfaction and turnover intention. A possible explanation for the missing relationships could be that the participants scored rather low on stereotype threat in general. The mean for stereotype threat refers to *slightly disagree* which implies that participants did not expect their gender to have an influence on how their male colleagues view them or females in STEM-related jobs in general. Thus, their feeling of experiencing stereotype threat was rather low. Although this is in contrast to what Steele et al. (2002) have found, it is a very encouraging finding.

Limitations and Suggestions for Future Research

The present study faces some limitations that should be considered when interpreting its results. First, the study was correlational in its nature and cannot imply causal relationships between the variables. In order to be able to draw conclusions about causality, an experimental research set up would be needed. In addition, it should be noted that the number of participants was not large enough to imply a moderate power. With a given sample size of 77 participants, a medium expected effect size and an alpha of 0.05, the achieved power turned out to be .71. Since statistical power is defined as the probability to correctly deny or keep a null hypothesis (Walmsley & Brown, 2017), a large power is preferable. A higher number of participants would have increased the confidence in denying

the proposed hypotheses of the current study. Therefore, the results of the present study should be interpreted with caution.

Since the current study is still one of very few studies focusing on predictors related to job satisfaction and turnover intention in female STEM employees, more research is needed in order to reduce the gender gap in these occupations. Therefore, because the present study could only focus on a limited set of predictors, future research should complement the current findings by analyzing the effects of other possible predictors of job satisfaction and turnover intention in female STEM employees. One possible example could be whether gender pay gaps influence job satisfaction and whether they have an impact on employees' decision to leave and find a fairer company to work for. Also, the level of involvement and influence within a company could potentially influence employees' satisfaction and turnover intention. August and Waltman (2004) have investigated how these two factors influence job satisfaction in female faculty members and found significant relationships between them. Hence, future studies could complement the current findings by looking at how these factors influence job satisfaction in case of female STEM employees – a group that still remains largely underrepresented in research.

Moreover, comparison studies would be interesting to see whether female STEM employees differ from other employees. For instance, one could compare how male STEM workers differ from female STEM workers regarding the predictors affecting their job satisfaction and turnover intention. Another option would be to compare women in male-dominated jobs to women in rather female-dominated occupations to assess whether there are factors that are more important to women who are underrepresented at their workplace.

Theoretical and Practical Implications

Although the study faces some limitations, it did not only provide new theoretical insights by expanding current research on female STEM employees, it was also one of the first to concentrate on the factors influencing job satisfaction and turnover intention in this very specific and underrepresented group. Considering that there is a big cry in the media for more female STEM workers (Gressler, 2019) and the benefits of a diverse workforce (Roberge & van Dick, 2010; Cox & Blake, 1991), a study concentrating on this target group was long overdue. Even though this study has not found an effect of work-life balance or stereotype threat on job satisfaction and turnover intention and PSE did not moderate these relations, PSE was found to significantly and positively relate to job satisfaction in female STEM employees.

The current study suggests that it can prove valuable to foster and promote PSE in female STEM employees considering the variable's positive relationship with job satisfaction. In order to effectively promote PSE, Heslin and Klehe (2006) emphasize the importance of breaking down self-efficacy into its main sources which are enactive mastery, role-modelling and verbal persuasion. Training managers in effectively using these sources to promote PSE in their (female) employees could not only improve their employees' confidence in their ability to perform well at work but simultaneously promote their job satisfaction all at once. Therefore, it is advised to offer a training program to line managers to help them understand the different sources of PSE and learn ways to promote them.

First, enactive master, which has been shown to be the strongest predictor of self-efficacy (Heslin & Klehe, 2006) can be tackled by giving employees tasks that are challenging but not beyond their current abilities. By regularly experiencing small successes, employees will become more confident to take on more challenging tasks. Second, role-modelling can be done either by the manager him- or herself or by a mentor but it should be noted that the likeability of a role model has great influence on whether or not role modelling is successful. Research has shown that by observing the successes of others, people can increase their own confidence in being able to perform a given task (Heslin & Klehe, 2006). Lastly, as the name suggests, Heslin and Klehe (2006) suggest that verbal persuasion can improve employees' PSE by praising them for their successes. However, employees' abilities should also be recognized by giving them more challenging tasks in the future subsequently.

After teaching managers ways to promote PSE in their employees, it is also important to keep an eye on the progress. Before putting their new knowledge into practice, managers should assess their employees' PSE. This can be done by using a questionnaire like the one that has been used in the present study. Assessing the employees' PSE should be repeated after two to three months in order to check whether what managers have learned during training was successfully put into practice and whether the employees' PSE increased.

Conclusion

The aim of the present research was to investigate whether work-life balance and stereotype threat predict job satisfaction and turnover intention in female STEM employees and whether PSE moderates these relationships. Whereas PSE was found to significantly and positively predict job satisfaction, no relationship was found for any of the predictor variables, turnover intention and job satisfaction. Therefore, it is suggested to focus on interventions that are aimed at aimed improving PSE in this specific target group. The present

research did not only shed a light on the importance of focusing on the retention of female STEM employees but also identified a predictor that could help in the process of retention which might ultimately lead to a diversification of the STEM workforce.

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Appendix

Appendix A

Information letter

Information letter

concerning a study for a master's thesis.

Title: Towards a diversified STEM workforce

Thank you very much for your interest in my study. My name is Laura Kraft and I am a work and organizational psychology student of the Radboud University Nijmegen. As part of my master's programme, I am currently doing my internship at an HR talent & learning department in Germany where I will also be writing my master's thesis. In order to do so, I will conduct a study on job satisfaction and turnover intentions of STEM workers under supervision of a teacher of the work & organizational psychology programme.

To be more precise, I will investigate possible gender differences for various factors influencing job satisfaction and turnover intentions. Trigger of the study is the persisting gender inequality in STEM fields and the importance of diversifying the workforce. To stay ahead of the competition, diverse teams that are able to provide creative, efficient solutions and innovations are key.

Insights gained by this study will be used to help companies develop better strategies to improve employee satisfaction and retention in general.

As a participant of this study you will first answer some demographical questions and continue to fill in five different multiple-choice questionnaires. In total, there are 47-items to be answered but the study should not take you longer than 15 minutes (although you can take as much time as you would like to).

During the study you can indicate at any moment in time that you want to quit participating, without you having to explain why you want to quit. Quitting during the study has no consequences whatsoever.

The information that I collect will be anonymously processed. This means that later on the results cannot be traced back to you. The consequence of this is that we cannot inform you about your personal results after the study has been completed.

If, after the study, you have remarks or complaints about this study, you can contact the general coordinator of the course for which the master's thesis will be conducted, Brigitte Claessens (b.claessens@psych.ru.nl). She will then invite you as soon as possible for a personal conversation.

Possible questions you have as a result of this information or after filling out the survey, you can ask by sending an email to **laura-elisabeth.kraft@student.ru.nl**.

If you indicate that you want to participate in this study, I will ask you to sign an informed consent form. By signing this form, you indicate that you are sufficiently informed about the study and that you want to voluntarily participate in the study.

Kind regards,

Laura Elisabeth Kraft

Work, Organization & Health Psychology student

Psychology Programme

Radboud Universiteit

- Continue

Appendix B

Informed consent form

Informed consent

... for participation in a study that is being conducted to serve as the basis for a master's thesis.

Title: Towards a diversified STEM workforce

I hereby confirm that

- I was satisfactorily informed about the study and I have read and understood the written information on the study.
- I was informed that the current study is conducted by a work & organizational psychology student as part of her master's project.
- I know who I can contact if I have any questions regarding the study.
- I was allowed sufficient time to consider whether to give my consent.
- I participate of my own free will.

I understand that

- I have the right to withdraw my consent at any time without having to give a reason and that withdrawing my participation has no further consequences.
- my information will be processed anonymously and will not be handed on to the company.
- the outcomes of the study cannot be considered as a diagnostic test.
- I will not be informed about my individual results.

I hereby consent to participate in the study referred to above.

- Agree
- Disagree

Appendix C

Questionnaire

Please indicate your gender.

- Female
- Male
- Other

Please indicate whether you currently hold a STEM (German: MINT) related position at a German company

STEM = Science, Technology, Engineering, Mathematics

MINT = Mathematik, Informatik, Naturwissenschaften, Technik

- Yes
- No

Please indicate your age.

- 18-24
- 25-40
- 41-59
- 60-75

Please indicate your current work location.

- Germany
- Other, namely...

Please indicate your work schedule.

- Full-time
- Part-time

On the next page you will find statements about your present job.

Read each statement carefully.

Decide how satisfied you feel about the aspect of your job described by the statement.

Keeping the statement in mind:

- if you feel that your job gives you more than you expected, check "Very Satisfied"
- if you feel that your job gives you what you expected, check "Satisfied"
- if you cannot make up your mind whether or not the job gives you what you expected, check "Neutral" (Neither satisfied nor dissatisfied)
- if you feel that your job gives you less than you expected, check "Dissatisfied"
- if you feel that your job gives you much less than you expected, check "Very Dissatisfied"

On my present job, this is how I feel about...

Being able to keep busy all the time.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The chance to work alone on the job.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The chance to do different things from time to time.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The chance to be 'somebody' in the community.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The way my boss handles his/her workers.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The competence of my supervisor in making decisions.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

Being able to do things that don't go against my conscience.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The way my job provides for steady employment.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The chance to do things for other people.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The chance to tell people what to do.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The chance to do something that makes use of my abilities.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The way company policies are put into practice.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

My pay and the amount of work I do.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The chances for advancement on this job.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The freedom to use my own judgement.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The chance to try my own methods of doing the job.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The working conditions.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The way my co-workers get along with each other.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The praise I get for doing a good job.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

The feeling of accomplishment I get from the job.

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

For each question, please choose the answer that comes closest to reflecting your opinion about it.

I currently have a good balance between the time I spend at work and the time I have available for non-work activities.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I have difficulty balancing my work and non-work activities.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I feel that the balance between my work demands and non-work activities is currently about right.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Overall, I believe that my work and non-work life are balanced.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

For each question, please choose the answer that comes closest to reflecting your opinion about it.

At work, I can always manage to solve difficult problems if I try hard enough.

- Not at all true
- Barely true
- Moderately true
- Exactly true

If someone opposes me at work, I can find the ways and means to get what I want.

- Not at all true
- Barely true
- Moderately true
- Exactly true

I am certain that I can accomplish my goals at work.

- Not at all true
- Barely true
- Moderately true
- Exactly true

I am confident that I could deal effectively with unexpected events that happen at work.

- Not at all true
- Barely true
- Moderately true
- Exactly true

Thanks to my resourcefulness, I can handle unforeseen situations at work.

- Not at all true
- Barely true
- Moderately true
- Exactly true

At work, I can solve most problems if I invest the necessary effort.

- Not at all true
- Barely true
- Moderately true
- Exactly true

I can remain calm when facing difficulties at work because I can rely on my coping abilities.

- Not at all true
- Barely true
- Moderately true
- Exactly true

When I am confronted with a problem at work, I can find several solutions.

- Not at all true
- Barely true
- Moderately true
- Exactly true

If I am in trouble at work, I can think of a good solution.

- Not at all true
- Barely true
- Moderately true
- Exactly true

At work, I can handle whatever comes my way.

- Not at all true
- Barely true
- Moderately true
- Exactly true

For each question, please choose the answer that comes closest to reflecting your opinion about it.

I will likely actively look for a new job in the next year.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I often think about quitting.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I probably look for a new job in the next year.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Female version

a) Some of my male colleagues believe . . .

I have less ability because I am a woman.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

Women have less ability than men.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

I am not as committed to my career because I am a woman.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

Women are not as committed to their careers as men.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

I am limited in my career because I am a woman.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

Women are limited in their careers.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

b) Sometimes I worry that...

My behavior at work will cause my male colleagues to think that stereotypes about women apply to me.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

My behavior at work will cause my male colleagues to think that stereotypes about women are true.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

If I make a mistake at work, my male colleagues will think that I am not cut out for this type of job because I am a woman.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

If I make a mistake at work, my male colleagues will think that women are not cut out for this type of job.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

Male version

a) Some of my female colleagues believe . . .

I have less ability because I am a man.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

Men have less ability than women.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

I am not as committed to my career because I am a man.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

Men are not as committed to their careers as women.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

I am limited in my career because I am a man.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

Men are limited in their careers.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

b) Sometimes I worry that...

My behavior at work will cause my female colleagues to think that stereotypes about men apply to me.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

My behavior at work will cause my female colleagues to think that stereotypes about men are true.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

If I make a mistake at work, my female colleagues will think that I am not cut out for this type of job because I am a man.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

If I make a mistake at work, my female colleagues will think that women are not cut out for this type of job.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Neutral
- Slightly agree
- Moderately agree
- Strongly agree

Appendix D

Debriefing Form

Thank you for participating in this study.

I appreciate your help and candidness in answering what are sometimes uncomfortable questions. Your contribution to this research is invaluable for helping to diversify the field of STEM.

The goal of this master's thesis is to improve employer branding strategies of German companies in order to attract more (female) STEM professionals and to improve strategies to keep them in the company in order to diversify the workforce in the long run.

However, in order to do so, it is first necessary to get an impression of how males and females differ regarding the challenges they face (e.g. stereotype threat, work-life balance and their individual feelings of self-efficacy) and how these challenges impact their job satisfaction and their intention to quit their jobs.

As stated before, your answers will be treated anonymously and will not be transferred to your supervisor, co-workers or any other person working at your company nor to any external people. Also, backtracking of your answers is not possible for me or anyone else.

I appreciate your honesty and willingness to assist with this research.

If you have any questions or comments, feel free to message me anytime!

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Thank you again for your time!

Kind regards,

Laura Kraft