International Journal of Gender, Science and Technology

NETWORK GENDER & STEM educational and occupational pathways and participation

Trust yourself: You have the IT-Factor! Career coaching for female computer scientists

Silvia Förtsch, Anja Gärtig-Daugs

University of Bamberg, Germany

ABSTRACT

This article aims to investigate gender differences in satisfaction with self-confidence between female and male computer sciences graduates in Germany and its interrelation with career ambitions. The analysis is based on data from the unique Alumnae Tracking Study. The results of our empirical study show that the satisfaction with self-confidence of female graduates is strongly influenced by the academic achievement and self-assessment of their special expertise. Male graduates show a higher satisfaction with self-confidence regard-less of their grades at university and their knowledge at time of graduation. Women who graduated from a study program with a high percentage of technical content are less satisfied with their self-confidence compared to graduates from other study programs. In addition, the duration of work experience influences the satisfaction with self-confidence of the computer scientists. Given these results, we offer insight into a coaching program that was implement-ed at the University of Bamberg. The program aims to strengthen self-confidence and motivational resources. Thus, the career development of computer science graduates is supported. This is illustrated by a case example.

KEYWORDS

Computer science, satisfaction with self-confidence, academic performance, self-concept, coaching

Trust yourself: You have the IT-Factor! Career coaching for female computer scientists

INTRODUCTION

Women`s underrepresentation in computer science (CS) is the result of an interplay of various factors. Theoretical concepts for the low participation of women in male-dominated professions especially refer to gender stereotypes (Cheryan et al., 2009; Cheryan et al., 2015), stereotype threat (Spencer, Steele & Quinn, 1999; Steele, 1997) and societal gender roles (Abele, 2003b; Athenstaedt, 2002; Athenstaedt & Alfermann, 2011; Athenstaedt & Mikula, 2008). Gender stereotypes, stereotype threat and societal gender roles not only affect the choices made regarding further education but also have an impact on decision making and the behavior of employees and employers. This leads to the lower participation of women in male-dominated disciplines such as CS, and affects career opportunities and the career ambitions of women (Boye, 2009; Claffey & Mickelson, 2009; Russo, 1976; Schneeweiß, 2016; Förtsch et al., 2018).

One could suspect that the successful management of challenges during the course of higher education might have resulted in a strengthened self-concept and in high self-confidence (Brown & Lent, 2005) in women. However, previous research has shown that gender gaps in self-confidence exist (Sax, 2008).

Self-confidence is seen as a facilitator of vocational success whereas a lack of confidence can result in reduced motivation and career inhibition (Brown & Lent, 2005; Bénabou & Tirole, 2001). Thus, lower satisfaction with self-confidence may lead to lower career ambitions.

The focus of our study is on satisfaction with self-confidence and its interrelation with career ambitions. Satisfaction with self-confidence is an aspect of satisfaction with oneself (Fahrenberg et al., 2000). It is strongly correlated with life satisfaction (Dette, 2005). Satisfaction and professional success are the results of professional and private development processes (Abele, 2002; Dette, 2005). They are not the endpoint of these processes but can initiate further development processes (Abele, 2002; Abele, 2003b). Thus, high satisfaction with self-confidence can lead to higher career ambitions whereas lower satisfaction with self-confidence can lead to lower career ambitions.

To examine the factors that lead to high satisfaction with self-confidence and to study the effects of satisfaction with self-confidence on the career ambitions of computer scientist, we made use of a unique data source, namely the Alumnae Tracking Study. This study offers detailed information on about 500 students and graduates of the Faculty of Information Systems and Applied Computer Sciences at the University of Bamberg. For the purpose of this article, we make use only of the graduates' subsample of the Alumnae Tracking Study. Based on the results of our quantitative analysis, we present a coaching program that was implemented to strengthen the self-confidence and motivational resources of CS graduates.

THEORETICAL FRAMEWORK

It is well known that women in male-dominated occupations have less career opportunities compared to men (Schneeweiß, 2016). They are more likely to leave their occupational area compared to women who are working in a job typically taken on by women (Jacobs, 1989; Schneeweiß, 2016). Further studies show that the risk of unemployment is higher for women who are working in a male dominated area (Schulte, 1995;Schreyer 1999; Arbeitsmarkt aktuell, 2010; Schneeweiß, 2016). Moreover, in Germany, female professionals in computer science are still confronted with a pay gap between men and women (Ruiz Ben, 2005; Goldin, 2014).

Gender-differences in self-confidence may be a factor that influences career paths as well as career opportunities. Self-confidence is defined as the strength of belief in one`s capabilities (Bandura 1986, 1997) to successfully execute a specific activity and to achieve goals (Wunderer 2004; Jünnemann, 2015). Self-confidence is seen as a personal resource and a facilitator of professional success. It depends on our (past and current) achievements and on our potentialities (James, 1890; Bandura, 1997). Therefore, it is reasonable to expect that academic performance and the self-assessment of professional skills have a large impact on self-confidence and the career success of men and women alike (Abele, 2002, 2003a, 2003b; Abele & Spurk, 2009; Abele, Spurk & Vollmer, 2011; Aisenbrey & Brückner, 2008; Spurk & Abele, 2014; Lent, Brown & Hackett, 1994, 2000; Förtsch et al., 2018).

Satisfaction is the product of a positive judgment process in which individuals evaluate themselves based on their own individual criteria (Wunderer, 2004; Dette, 2005). Satisfaction with self-confidence is one item on the scale of satisfaction with oneself and belongs to the global concept of life satisfaction (Fahrenberg et al., 2000). High satisfaction values indicate that the person is satisfied with herself, her skills, self-confidence and how her life has been lived so far (Fahrenberg et al., 2000). It is known that all aspects of life satisfaction are strongly correlated (Dette, 2005). Thus, in this study we have focused on one aspect of life satisfaction, i. e. satisfaction with self-confidence.
Life satisfaction and professional success are the results of professional and private development processes and the fulfillment of life goals (Abele, 2002; Dette, 2005; Fahrenberg et al. 2000; Pavot & Diener, 1993). Thus, positive professional development in the sense of reaching or moving closer to important work goals or climbing up the career ladder contributes to subjective and objective professional success and influences life satisfaction (Abele, 2002, 2003b). It is important to note that life satisfaction and professional success are not the final stage of professional and private development processes but also initiate further processes. Therefore, we examined the relation between a high level of satisfaction with self-confidence and career ambitions. We supposed that high levels of self-confidence might result in higher career ambitions.

Professional development processes depend, among other things, on the self-evaluation of skills, "objective" performance criteria such as university grades, and the self-concept of the individual (Abele, 2002; Abele, 2003a, 2003b). It is well

known that men and women differ in their self-evaluation of skills. Men tend to overestimate their capabilities, whereas women tend to underestimate their skills (Beyer, 1990, 2016; Kling et al., 1999; Spurk & Abele, 2014; Ertl, Luttenberger & Paechter, 2017). In addition, gender stereotypes with deep cultural roots have a major influence on how men and women perceive themselves and rate their own skills. Not all, but certainly some women who work in a male-dominated field of occupation might doubt if they have the relevant abilities to succeed in this domain (Shavelson, Hubner & Stanton, 1976; Marsh, 1986; Steele, 1997; Spencer, Steele & Quinn, 1999; Skaalvik & Skaalvik, 2004; Hannover & Kessels, 2004; Eckes, 2008). Starting from early childhood, technical talent is (falsely) attributed to men (Super, 1957, 1980; Holland, 1985; Eccles et al., 1983; Lent, Brown & Hackett, 1994; Bandura, 1997; Abele, Spurk & Vollmer, 2011; Hannover & Kessels, 2004; Förtsch, Gärtig-Daugs & Schmid, 2015). Thus, men believe in their apparent talent for technical fields, whereas women who have chosen a career in an untypical field, such as Science, Technology, Engineering, and Mathematics (STEM), might be negatively affected by gender stereotypes(Bescherer, 2003;Berdousis & Kordaki, 2015; Cheryan et al., 2011; Kessels, 2012; Klieme, 2000; Kosuch, 2010; Marsh & Yeung, 1998 Sáinz & Eccles, 2012; Förtsch, Gärtig-Daugs & Schmid, 2015; Smith et al., 2012; Weinhardt, 2017;). This might shape their beliefs about themselves and lead, on average, to lower satisfaction in self-confidence (Bandura, 1997; Bordalo et al., 2019; Eccles et al. 1983; Eccles, Wigfield & Schiefele, 1998; Eccles & Wigfield, 2002, Wigfield & Eccles, 2002). Thus, we assume that the satisfaction with confidence exhibited by the graduates in our study with regard to their academic achievement and professional skills differs systematically. We expect that excellent university grades and highly rated professional expertise is required for female graduates to be satisfied with their self-confidence. This may be especially true for highly technically oriented courses of study.

Due to the highly selective sample, (e.g., highly capable women and men who have chosen computer science as a career), we expect that no gender differences in academic performance would be observed. Research on stereotype threat however suggests that environments activate stereotype threat (Steele, 1997; Spencer, Steele & Quinn, 1999). Women who pursue a course of studies in the field of computer science enter a strongly male-dominated area. Instead of believing in their capabilities, women tend to rate their capabilities concerning technical subjects, for example programming, lower than men do (Spencer, Steele & Quinn, 1999). Thus, we expect that women rate their skills lower but perform just as well as men on more objective assessments such as exams.

Furthermore, we suggest that the satisfaction with one`s self-confidence is correlated with the individual's academic self-concept. The latter is influenced by the competence students experience during university (Möller, 2015). However, here again gender stereotypes play an important role. This leads to the fact that the evaluation of performance often differs between men and women (Ertl, Luttenberger & Paechter, 2017; Shavelson et al. 1976; Marsh, 1986; Skaalvik & Skaalvik, 2004). Thus, we expect that female computer science graduates have a lower self-concept and rate their expert knowledge at time of graduation as low

than their male counterparts - even if they have achieved the same grades. This may result in the lower satisfaction with self-confidence of female graduates.

Self-confidence also relies on strengthening occupational experiences and positive performance feedback (Mortimer & Lorence, 1979; Lent et al. 1994; Abele, 2002). Thus, we assume that women with more occupational experience are more satisfied with their self-confidence, whereas young female professionals are less satisfied with their self-confidence. Women with work experience have successfully completed professional tasks they were given and have proved themselves competent as computer scientists. In contrast, women at an early stage of their career are more uncertain about their capabilities as well as about the working content and conditions they desire (Carter & Silva, 2011; Edding, 2014; Elprana et al., 2012; Edding, 2014). Furthermore, women have to work harder than men in order to receive positive appraisals (Gorman & Kmec, 2007). Thus, we suggest that the satisfaction with self-confidence of women is lower than that of men regardless of the years of work experience.

RESEARCH DESIGN, DATA, AND METHODS

This paper consists of two parts:
1) A quantitative analysis of data of the Alumnae Tracking Study, and
2) A case example that illustrates the goals and outcomes of a coaching program that was implemented at the Faculty of Information Systems and Applied Computer Sciences as consequence of the findings of the quantitative analyses.
Thus, we first proceed with the description of the data collection, sample and analytical procedures, operationalisation and the main outcome of the quantitative analysis. After that, we describe the coaching program, its target group, and methodological basis and give a case example.

DATA COLLECTION AND SAMPLE OF THE QUANTITATIVE ANALYSES

The quantitative analysis was based on data of the Alumnae Tracking Study. The Alumnae Tracking Study collected data on students and graduates of the Faculty of Information Systems and Applied Computer Sciences in the years 2013, 2014, and 2015. In total, about 500 students and graduates participated in the quantitative study. In the presented analysis, we were interested in gender differences in the context of satisfaction with self-confidence of computer science graduates. Therefore, we used data of the graduates for the analysis. Due to missing values, our analytical sample included 261 individuals.

RESEARCH QUESTIONS AND STEPS

The first step of our analysis was driven by the question:
Is there a gender difference in academic performance at university (indicated by final grades) and the self-assessment of acquired expert knowledge during course of studies? This step of analysis was important. If we cannot find gender differences in academic performance and self-assessment of expert knowledge in computer science all following results cannot be attributed to these objects of investigation. This means that differences in satisfaction with self-confidence and career ambitions cannot be attributed to differences in academic performance or self-assessment of expert knowledge.

Academic achievement and self-assessment of expert knowledge were measured retrospectively. The retrospective assessment of acquired expert knowledge at university could be shaped by work experience since graduation. Thus, we controlled for year of graduation. Besides that, final grades at university could depend on the study program of the students. Thus, we also controlled for study program.

The next step of our empirical study related to the self-confidence of computer scientists. It was driven by the following question:

Do computer scientists differ in satisfaction with their self-confidence? At this stage of investigation, we examined to what extent performance at university and self-assessment of expert knowledge influence gender-specific satisfaction with self-confidence. Satisfaction with self-confidence and career ambition were measured at time of survey. Satisfaction with self-confidence is strongly correlated with life satisfaction and the state of life satisfaction applies in the long term as stable (Dette, 2005). Thus, we considered it as useful to use academic achievement and self-assessment of expert knowledge as predictive variables. To capture possible change processes we also controlled for year of graduation and study program.

In order to understand gender-specific differences in the effect of academic achievement at university on graduates' satisfaction with their self-confidence, we introduced an interaction between graduates' gender and the corresponding variable. In the same way, we regarded gender-specific effects of self-assessed expert knowledge in computer science on satisfaction with self-confidence. In all analyses, we controlled for year of graduation and study program.

Finally, the last step of our analysis was driven by the following question:

Are there gender-specific effects of satisfaction with self-confidence on career ambitions? We examined to what extent satisfaction with self-confidence influences gender-specific career ambitions of computer science graduates. Here, we focused on leadership ambitions. Students in some study programs—for example, in information systems—are more willing to take over over leadership responsibilities than others (Pflaum, 2017). Thus, we controlled for study program. Furthermore, performance at university and professional experiences could have influenced leadership ambitions. Thus, we also controlled for final grades, self-assessed expert knowledge in computer science and year of graduation.

In order to understand, gender differences in the effect of satisfaction with self-confidence on leadership ambitions, we implemented an interaction between graduates' gender and satisfaction with self-confidence. Here again, we controlled for all variables mentioned above.

ANALYTICAL PROCEDURES

In accordance to the low participation of women in the field of computer science, the proportion of women in our sample was small. Due to the occurrence of several empty cells, a dichotomization of some variables was required in order to estimate the multivariate models intended. We estimated a series of binary logistic regression models and always reported average marginal effects (AME) and

predictive margins (PM). Predictive margins can be interpreted as average probabilities for the outcome, at the variables' mean values. Average marginal effects are the percentage point differences between the estimated predictive margins and allowed us to test whether or not differences in the estimated predictive margins were statistically significant (Mood, 2010). For clarity, we mainly reported the results for graduates' gender as well as gender-specific interaction effects, although our models usually controlled additional factors. The additional covariates we controlled for in the different models are reported in the notes section under each table or figure, respectively.

We present results on gender differences in: (a) academic achievement at university (retrospective point of view); (b) graduates' self-assessment of expert knowledge in computer science at time of graduation (retrospective point of view); (c) graduates' satisfaction with self-confidence (at time of survey); (d) graduates career ambitions (at time of survey). All variables were measured at time of survey.

OPERATIONALIZATION

To operationalize graduates' performance at university, we made use of information on their academic achievements — specifically, final grades.

The final grades reported were dichotomized so that higher and lower achieving students could be distinguished. To operationalize the graduates´ self-assessment of expert knowledge in computer science at time of graduation, we made use of a specific item of the Alumnae Tracking Study. We asked the graduates at time of survey to what extent - from a retrospectively point of view - they believed to have acquired special expertise for the profession of computer science during their course of studies. They were able to rate their expert knowledge in computer science on a 5-point scale, ranging from "1 (very small extent)" to "5 (very large extent)". The rating results were dichotomized into "very high and high" and "average and low." Based on another specific question of the Alumna Tracking Study, we asked the participants on a 7-point scale how satisfied they were with their self-confidence, ranging from "1 (very dissatisfied)" to "7 (very satisfied)"[1]. The findings were dichotomized to "satisfied" and "dissatisfied."

Career ambitions were measured based on the question how important it is to take over a leading position. Answers could be given on a 5-point scale, ranging from 1 "not important" to 5 "very important." The ratings were dichotomized into the two categories "very important or important" and "moderate important or not important."

Additional variables in the multivariate models were year of graduation and course of study. We grouped the variable time of graduation in three categories from 2000 to 2005, 2006 to 2010, and 2011 to 2014. The variable for course of study differed between applied computer science, information systems, and course of study with less emphasis on informatics.

Table 1 summarizes the main characteristics of our sample. Our core independent variable was the gender of the respondent. To understand the role of gender-specific effects on the academic achievement of graduates, their self-assessment of expert knowledge in computer science at time of graduation, their satisfaction of

self-confidence, and their career ambitions, we additionally estimated interactions between the respondents' gender and the corresponding covariates.

Table 1: Core characteristics of the sample

	n	Percent
Total	261	100.00
Gender		
Male	220	84.29
Female	41	15.71
Academic Achievement at university		
Excellent	92	35.25
Achieving lower results	169	64.75
Self-assessment of expert knowledge in computer science		
Very high or high	141	54.02
Average or low	120	45.98
Satisfaction with self-confidence		
satisfied	218	83.52
dissatisfied	43	16.48
To get a leadership position		
Very important or important	131	50.19
Moderate important or not important	130	49.18
Year of graduation		
2000-2005	44	16.68
2006-2010	115	44.06
2011-2014	102	39.08
Course of study		
Information systems	193	73.95
Applied computer science	34	13.03
Computer science courses with less emphasis on informatics	34	13.03

Source: Our own calculations based on data from Alumnae Tracking Study.

RESULTS

Is there a gender difference in academic achievement and self-assessment of acquired expert knowledge in computer science?

In our first empirical analysis, we considered whether computer scientists differed in their academic achievements at university and their retrospective self-assessment of expert knowledge they had acquired during their course of studies. Table 2 reports the results of our multivariate analyses.

Table 2: Gender differences in graduates' academic achievements at university and self-assessment of expert knowledge (logistic regression models).

	Excellent achievement at university (Model 1)		Very High or high self-assessment of expert knowledge (Model 2)	
	AME	PM	AME	PM
Men	Ref.	33.44	Ref.	55.24
Women	11.67	44.10	−7.74	47.50
n	261			
Log likelihood	−164.19		−175.82	

Source: Own calculations based on data from the Alumnae Tracking Study.
AME = Average Marginal Effects (expressed as percentage points), PM = Predictive Margins (expressed as percentages).
Both models control year of graduation and course of study.

The predictive margins showed that female computer scientists had higher grades on their exam at university compared to men (Model 1). Slightly less than half (44%) of the women achieved excellent performance at university and only around a third of men (33%) achieved this level. However, the women estimated their expert knowledge lower compared to male computer scientists (Model 2). Although the results were not significant, the direction could be identified. Nevertheless, the results were important. Our conclusion was that the following results of gender differences in graduates´ satisfaction with self-confidence could not be attributed to these objects of investigation.

Do computer scientists differ in satisfaction with their self-confidence?
The next question of our empirical study related to the self-confidence of computer scientists.

Even though female computer scientist achieved better grades at university compared to men, we clearly found gender differences in satisfaction with their self-confidence. Most of the male respondents (on average 86%) were satisfied with their self-confidence (Model 3), in the case of women, only 70% felt similarly. As the estimated average marginal effect showed, the difference of 15.52 percentage points between male and female computer scientists was significant

Table 3: Gender differences in satisfaction with self-confidence (logistic regression).

	Satisfied with self-confidence (Model 3)	
	AME	PM
Men	Ref.	86.07
Women	−15.52*	70.54
n		261
Log likelihood		−104.02

Source: Own calculations based on data from the Alumnae Tracking Study.
Notes: *p < 0.05

AME = Average Marginal Effects (expressed as percentage points), PM = Predictive Margins (expressed as percentages). Besides gender, the model additionally controls for respondents' year of graduation, course of study, achievement at university and self-assessment of expert knowledge at time of graduation.

Next, to our analysis, we turned to the main effects of covariates that were important to our empirical study (see Table 4)

Our results showed that academic achievement at university and the self-assessment of acquired expert knowledge at university were not significantly related to satisfaction with the self-confidence of the computer scientists. Counterintuitively, those graduates who had not completed their studies with a very good grade were more satisfied with their self-confidence. However, the following gender analysis showed that male and female computer scientists rated satisfaction with self-confidence very differently. However, there was a significant result for time of graduation related to satisfaction with self-confidence. The longer the time since graduation, the more self-confidence they had. Almost all graduates (95%) who had finished their studies nearly 15 or 20 years ago were satisfied with their self-confidence compared to graduates (over 85%) who had passed their graduation between the years of 2006 and 2010. The difference of 9.68 percentage points was significant. For computer scientists who had graduated between 2011 and 2014, only 76% were convinced of their self-confidence. This result was also significant (difference of 18.56 percentage points). The course of study was also important for rating satisfaction with self-confidence . Over 92% of graduates who had taken a course in computer science with less emphasis on informatics rated their self-confidence high. In contrast to this result, about 83% of graduates in information systems believed in their self-confidence. The difference between graduates in information systems and courses with less emphasis on informatics was significant (difference of 9.31 percentage points). Only three-quarters of graduates with degrees in applied computer science were convinced of their self-

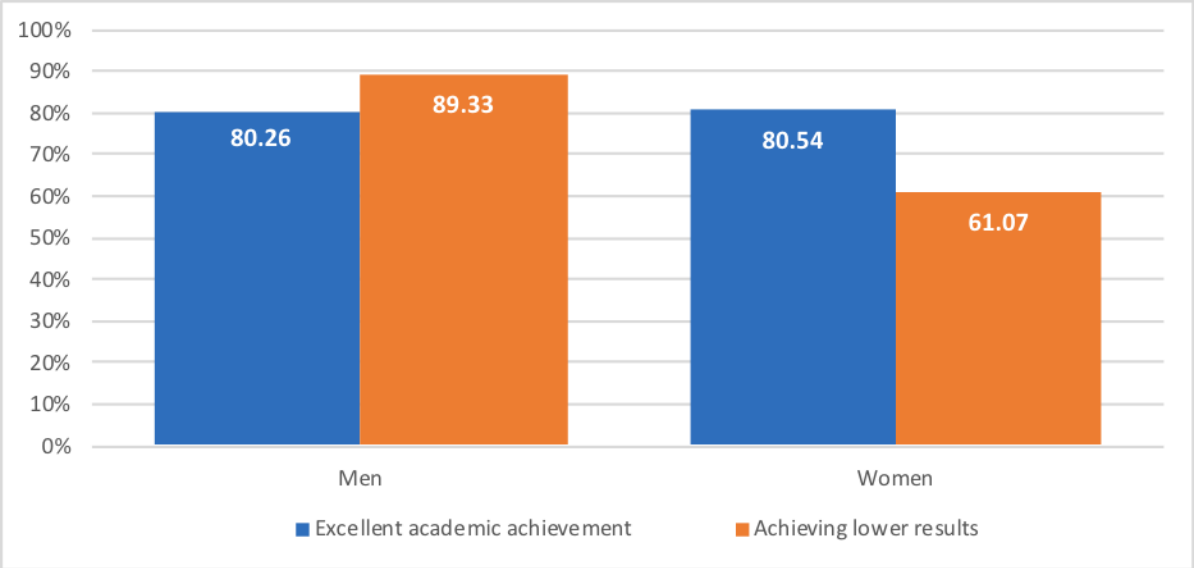
confidence. The difference between these graduates and graduates of courses with less emphasis on informatics was significant with 17.62 percentage points.

Table 4: Differences in graduates' academic achievement at university, self-assessment of expert knowledge at time of graduation, year of graduation and course of study on the average probability of being satisfied with self-confidence (logistic regression).

Model (4)	AME	PM
Academic achievement at university		
Excellent	–	80.95
Achieving lower results	4.14	85.09
Self-assessment of expert knowledge		
Very high or high	–	85.68
Average or low	–4.81	80.88
Year of graduation		
2000-2005	–	95.26
2006-2010	–9.68*	85.58
2011-2014	–18.56**	76.70
Course of study		
Computer science courses with less emphasis on informatics	–	92.74
Information systems	–9.31*	83.43
Applied computer science	–17.62*	75.12
n	261	
Log likelihood	–104.02	

Source: Own calculations based on data from the Alumnae Tracking Study.
Notes: **p < 0.01, *p < 0.05
AME = Average Marginal Effects (expressed as percentage points), PM = Predictive Margins (expressed as percentages). The model controls of gender.

To understand gender-specific differences in the effect of academic achievement at university on graduates' satisfaction with their self-confidence, we introduced an interaction between graduates' gender and their academic achievements in an additional model. The corresponding results are presented in Figure 1.



Source: Our own calculations based on data from the Alumnae Tracking Study.
Notes: Predictive margins (expressed as percentages) derived from a logistic regression model that also controls for respondents' assessment of expert knowledge at time of graduation, year of graduation and course of study.

Figure 1: Gender-specific effects of graduates' academic achievements at university on satisfaction with self-confidence.

Our results indicated that gender-specific differences in the effect of graduates' academic achievements at university on satisfaction with their self-confidence existed, see Table 5. As expected, satisfaction with self-confidence in men did not depend on their academic achievement at university. On the contrary, the men who had reported lower academic performance rated their self-confidence higher compared to men who had graduated from university with excellent degrees (on average 80% and 89%). The difference of 9 percentage points was significant at the 10% level.

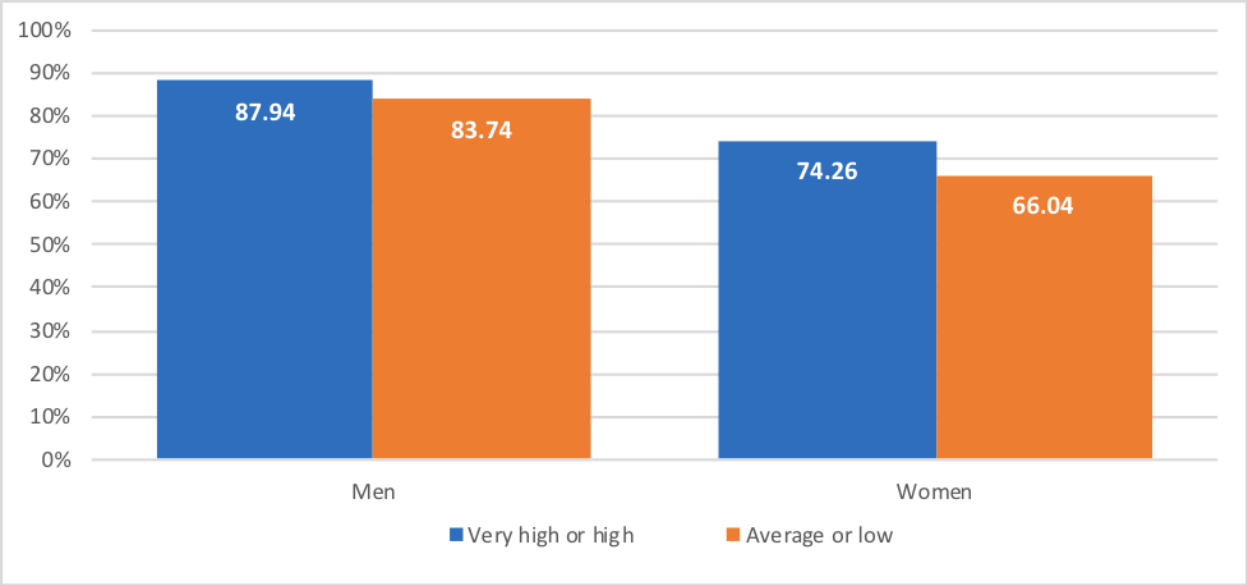
In contrast, women's satisfaction with their self-confidence clearly depended on their previous academic performance at university. While 80% of the excellent-achieving female computer scientists believed in their self-confidence, this was the case for only about 61% of the women attaining lower academic achievements at university, even if the difference of about 19 percentage points was not significant. Indeed the difference of men and women who had achieved lower academic performance was, at 28 percentage points, highly significant. Women in computer science were much more oriented on their academic performance if they rated their self-confidence positively.

Table 5: Percent point difference in the average of satisfaction with self-confidence, by grade and gender (logistic regression).

Model (5)	AME
Excellent academic achievement	
Men	–
Women	0.28
Achieving lower results	
Men	–
Women	−28.26 **
Men	
Excellent academic achievement	–
Achieving lower results	9.07 +
Women	
Excellent academic achievement	–
Achieving lower results	−19.47
n	261
Log likelihood	−101.61

Source: Own calculations based on data from the Alumnae Tracking Study.
Notes: **p < 0.01, *p < 0.05, +p < 0.10
AME = Average Marginal Effects (expressed as percentage points). The model controls for respondents' assessment of expert knowledge at time of graduation, year of graduation and course of study.

Next, of our analysis, we were interested in specific gender effects regarding graduates´ self-assessment of expert knowledge. Therefore, we introduced a model that estimated an interaction between graduates' gender and their self-assessment of expert knowledge at time of graduation. The corresponding results are presented in Figure 2.



Source: Our own calculations based on data from the Alumnae Tracking Study.
Notes: PM = Predictive margins (expressed as percentages) derived from a logistic regression model that also controls for academic achievement at university, year of graduation and course of study.

Figure 2: Gender-specific effects of graduates 'self-assessment of expert knowledge on satisfaction with self-confidence.

The results were as follows in Table 6: Nearly 88% of men who were convinced of their expert knowledge they had acquired at university were also satisfied with their self-confidence. In contrast, only about 74% of women who rated their expertise as high were satisfied with their self-confidence. However, even if men rated their acquired expert knowledge lower, over 83% were satisfied with their self-confidence. By comparison, only 66% of women with lower perceived expert knowledge were convinced of their self-confidence. The difference of over 17 percentage points was on the 10% level significant. The results can be summarized as follows: Men generally had a high level of self-confidence, regardless of their objective performance and self-assessment.

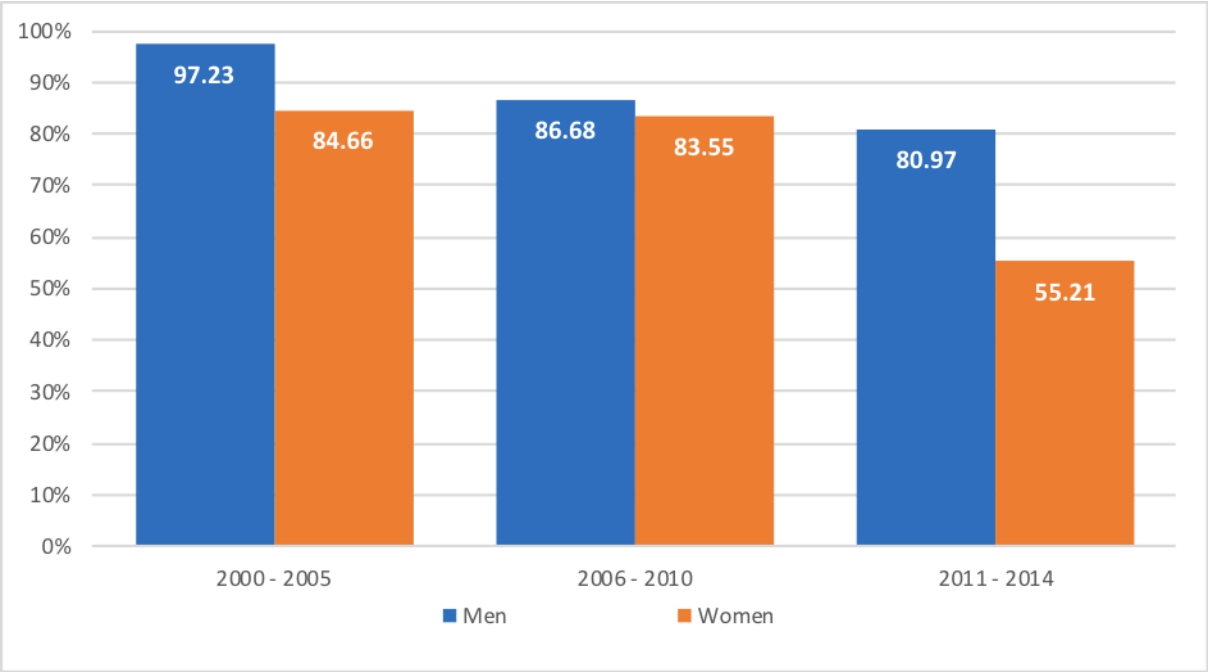
Table 6: Percent point difference in the average of satisfaction with self-confidence, by self-assessment of expert knowledge at time of graduation and gender (logistic regression).

Model (6)	AME
Very high or high expert knowledge	
Men	–
Women	−13.68
Average or low expert knowledge	
Men	–
Women	−17.70 +
Men	
Very high or high expert knowledge	–
Average or low expert knowledge	−4.2
Women	
Very high or high expert knowledge	–
Average or low expert knowledge	−8.22
n	261
Log likelihood	−104.02

Source: Own calculations based on data from the Alumnae Tracking Study.
Notes: +p < 0.10
AME = Average Marginal Effects (expressed as percentage points). The model controls for academic achievement at university, year of graduation and course of study.

We also suspected a gender effect at time of graduation and satisfaction with self-confidence. The main effects of the corresponding regression showed a significant result. In Figure 3 and Table 7, we presented an interaction between graduates' gender and their time of graduation. We could recognize that almost all men (97%) in our sample who had graduated at an early stage (2000 – 2005) were highly satisfied with their self-confidence. In this case, about 85% of women rated their self-confidence on this level. Overall, we observed that more recent graduates of informatics science were less satisfied. The difference between the earlier periods and later periods was at 10.5 and 16 percent points respectively significant for the male professionals. For female computer scientists, the difference between earlier and latest stage of graduation at 29 percentage points was significant at the 10% level. Furthermore, we identified a significant gender effect for the group of computer scientists who had completed their studies at a later stage. While over 80% of the men felt satisfied with their self-confidence, in comparison only half of the women (55%) were satisfied with their self-confidence if they had graduated between the year of 2011 and 2014. The difference between male and female professionals was with 25 percentage points significant at the 5% level. Therefore,

we can summarize: Women in computer science need - particularly at an early stage of their career - support to improve their self-confidence and facilitate their career development.



Source: Our own calculations based on data from the Alumnae Tracking Study.
Notes: PM = Predictive margins (expressed as percentages) derived from a logistic regression model that also controls for academic achievement at university, assessment of expert knowledge at time of graduation and course of study.

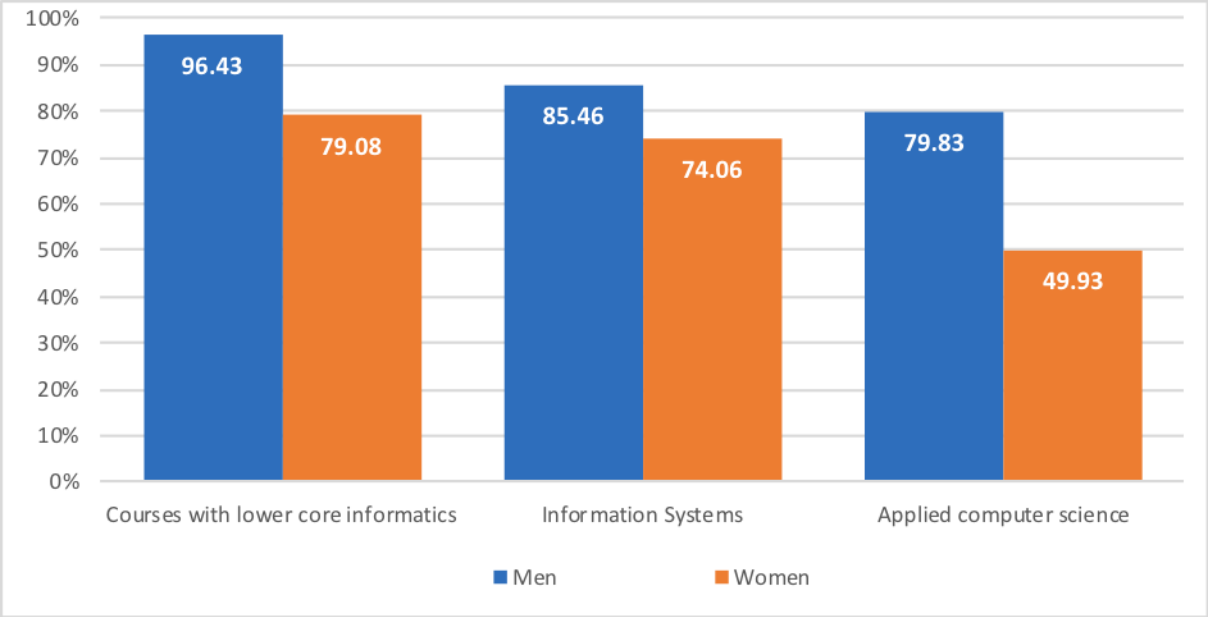
Figure 3: Gender-specific effects of graduates 'year of graduation on satisfaction with self-confidence.

Table 7: Percent point difference in the average of satisfaction with self-confidence, by year of graduation and gender (logistic regression).

Model (7)	AME
Graduation at university between 2000 - 2005	
Men	–
Women	−12.56
Graduation at university between 2006 - 2010	
Men	–
Women	−3.32
Graduation at university between 2011 - 2014	
Men	–
Women	−25.76 *
Men	
Graduation at university between 2000 - 2005	–
Graduation at university between 2006 - 2010	−10.54 *
Graduation at university between 2011 - 2014	−16.26 **
Women	
Graduation at university between 2000 - 2005	–
Graduation at university between 2006 - 2010	−1.30
Graduation at university between 2011 - 2014	−29.45 +
n	261
Log likelihood	−103.29

Source: Own calculations based on data from the Alumnae Tracking Study.
Notes: **p < 0.01, *p < 0.05, +p < 0.10
AME = Average Marginal Effects (expressed as percentage points). The model controls for respondents' academic achievement at university, assessment of expert knowledge at time of graduation and course of study.

Next, we examined to what extent the orientation of the study program influenced the self-confidence of computer scientists. Again, we were interested in specific gender effects. Therefore, we implemented an interaction effect between gender and the study program of the graduates (Figure 4).



Source: Our own calculations based on data from the Alumnae Tracking Study.
Notes: PM = Predictive margins (expressed as percentages) derived from a logistic regression model that also controls for academic achievement at university, assessment of expert knowledge at time of graduation and year of graduation.

Figure 4: Gender-specific effects of graduates' course of study on satisfaction and self-confidence.

It is interesting to note, that almost all men who had graduated in a study program with less emphasis on informatics, rated their self-confidence positively. In the case of women, the percentage was only 79%, although the difference was not significant. However, there were significant results for the men's group. Table 8 shows that men who had graduated in information systems or in applied computer science were less satisfied with their self-confidence as compared to men who got their degree in study programs with less emphasis on informatics. The difference was almost 11 and 16 percentage points respectively. It was not really surprising that women who had graduated in applied computer science, i. e. in a very technically oriented study program, were less satisfied with their self-confidence. Gender stereotypes seemed to have worked here. However, the difference of almost 29 percentage points between female and male professionals was not significant. This result might be attributed to the small sample size.

Table 8: Percent point difference in the average of satisfaction with self-confidence, by course of study and gender (logistic regression).

Model (8)	AME
Course of study with less emphasis on informatics	
Men	–
Women	−17.35
Information systems	
Men	–
Women	−11.40
Applied computer science	
Men	–
Women	−29.90
Men	
Course of study with less emphasis on informatics	–
Information systems	−10.97 *
Applied computer science	−16.60 *
Women	
Course of study with less emphasis on informatics	–
Information systems	−5.02
Applied computer science	−29.15
n	261
Log likelihood	−103.48

Source: Own calculations based on data from the Alumnae Tracking Study.
Notes: *p < 0.05
AME = Average Marginal Effects (expressed as percentage points). The model controls for respondents' academic achievement at university, assessment of expert knowledge at time of graduation and year of graduation.

Are there gender-specific effects of satisfaction with self-confidence on career ambitions?

In the last step of our analysis, we wanted to find out if satisfaction with self-confidence had gender specific effects on career ambitions. Career ambitions were measured based on the question how important it was to take over a leading position. Table 9 reported the results of our multivariate analyses.

Table 9: Gender differences in graduates' ambitions towards a job with leadership responsibilities (logistic regression).

	(Model 9)	
	AME	PM
Men	Ref.	52.57
Women	−15.20+	37.37
n		261
Log likelihood		−176.46

Source: Own calculations based on data from the Alumnae Tracking Study.
Notes: +p < 0.10
AME = Average Marginal Effects (expressed as percentage points), PM = Predictive Margins (expressed as percentages). Besides gender, the model additionally controls for respondents' year of graduation, course of study, achievement at university, self-assessment of expert knowledge at time of graduation and satisfaction with self-confidence.

While it was important for more than half (52%) of the men to get a job with leadership responsibilities, this only applied to just over a third (37%) of women. The difference of 15 percentage points between female and male professionals was significant at the 10% level. Next, to our analysis, we turned to the main effects of covariates that were important to our empirical study in Table 10. The results showed, that computer scientists who were satisfied with their self-confidence were more interested in getting a leadership position (over 50%). Those who were dissatisfied with their self-confidence were less interested in a job with leadership responsibilities (over 30 %). The difference of 22 percentage points was highly statistically significant. It was interesting, but not surprising that computer scientists with lower academic achievement (over the half) had highly career ambitions. This finding was related to the men of our sample and was consistent with the results in model 5. There was a significant result, with 20 percentage points for computer scientists with excellent academic achievement as compared to lower-achieving results regarding leadership aspirations. Men were less influenced by their academic achievement if they had the goal to achieve a job with leadership responsibilities. Women, on the other hand, payed much more attention to their objective achievements if they had such career goals. Regarding this assumption, we were able to report another interaction effect between graduates' gender and their academic achievements towards the goal to aspire a job with leadership responsibilities. This analysis is not shown; however, it was significant at the 10% level. Interesting was also the finding that over the half of the computer scientist who had graduated in information system were significantly (at 10% level) more interested in getting a job with leadership responsibilities compared to computer scientists who had graduated in courses with less emphasis on informatics. The

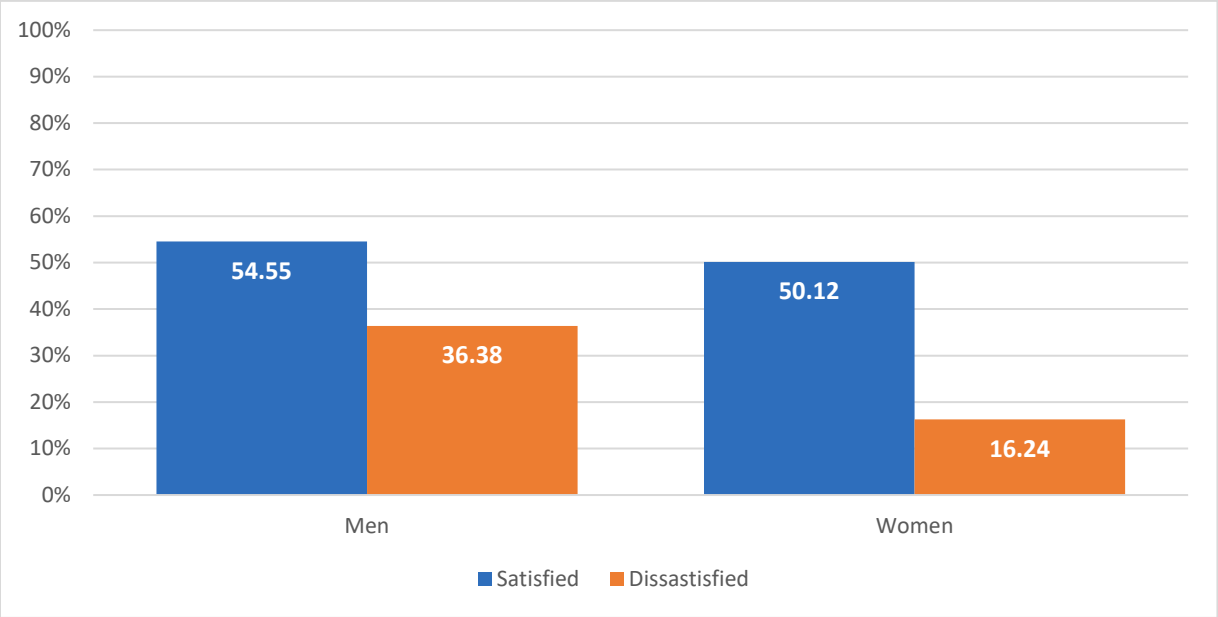
difference was 14 percentage points. It seemed that graduates of information systems were more interested to climb up the career ladder.

Table 10: Differences in graduates' satisfaction with self-confidence, academic achievement at university, self-assessment of expert knowledge at time of graduation, year of graduation and course of study on the average probability of graduates' ambitions towards a job with leadership responsibilities (logistic regression)

Model (10)	AME	PM
Satisfied with self-confidence		
Satisfied	–	53.75
Dissatisfied	−22.20**	31.45
Academic achievement at university		
Excellent	–	37.20
Achieving lower results	20.01**	57.21
Self-assessment of expert knowledge		
Very high or high	–	54.11
Average or low	−8.62	45.49
Year of graduation		
2000-2005	–	48.42
2006-2010	07.90	49.21
2011-2014	3.70	52.12
Course of study		
Computer science courses with less emphasis on informatics	–	39.47
Information systems	14.73+	54.20
Applied computer science	−1.73	37.74
n	261	
Log likelihood	−167.00	

Source: Own calculations based on data from the Alumnae Tracking Study.
Notes: **p < 0.01, *p < 0.05, +p < 0.10
AME = Average Marginal Effects (expressed as percentage points), PM = Predictive Margins (expressed as percentages). The model controls of gender.

As last step of our analysis, we also suspected a gender effect between confidence and graduates' ambitions towards a job with leadership responsibilities. Again, we were interested in specific gender effects. Therefore, we implemented an interaction effect between graduates' gender and satisfaction with self-confidence towards the goal to aspire a job with leadership responsibilities (Figure 5).



Source: Our own calculations based on data from the Alumnae Tracking Study.
Notes: PM = Predictive margins (expressed as percentages) derived from a logistic regression model that also controls for academic achievement at university, self-assessment of expert knowledge at time of graduation, year of graduation and course of study.

Figure 5: Gender-specific effects of satisfaction with self-confidence on graduates' ambitions towards a job with leadership responsibilities.

The gender effect showed that women and men who were dissatisfied with their self-confidence were less interested in a leadership position. While more than the half of men who were satisfied with their self-confidence were motivated to take a leadership position, only about one-third of men who were dissatisfied were interested in such a job. The difference was significant with 18 percentage points at the 10% level. For women in our sample, the result was even clearer. Likewise, half of the women who were satisfied with their self-confidence were motivated to take leadership responsibilities. However, significantly fewer women, namely 16%, who were dissatisfied with their self-confidence wanted a job with leadership responsibilities. The difference was with 33 percentage points at the 5% level significant (Table 11).

Table 11: Percent point difference in the average of graduates' ambitions towards a job with leadership responsibilities, by satisfaction with self-confidence and gender (logistic regression).

Model (11)	AME
Satisfied with self-confidence	
Men	–
Women	−4.42
Dissatisfied with self-confidence	
Men	–
women	−20.14
Men	
Satisfied with self-confidence	–
Dissatisfied with self-confidence	−18.17 +
Women	
Satisfied with self-confidence	–
Dissatisfied with self-confidence	−33.88*
n	261
Log likelihood	−166.51

Source: Own calculations based on data from the Alumnae Tracking Study.
Notes: *p < 0.05, +p < 0.10
AME = Average Marginal Effects (expressed as percentage points). The model controls for respondents' academic achievement at university, assessment of expert knowledge at time of graduation, year of graduation and course of study.

DISCUSSION OF THE QUANTITATIVE ANALYSIS

The aim of the quantitative analysis was to study gender differences of professionals in computer science. Thus, we investigated whether or not male and female professionals who successfully graduated from a course of computer science differ in their academic performance, self-assessment of expert knowledge at time of graduation and satisfaction with self-confidence. It is known that self-confidence, expert knowledge, and academic performance influence the professional development and the career ambitions of employees (Lent, Brown & Hackett, 1994; Abele, 2003b; Förtsch et al, 2018). For the empirical analyses, we used data from the Alumnae Tracking study. Although our sample is small, we can present important results regarding gender and, to our knowledge, no comparable studies of computer scientists in Germany exist.

The first thing to mention is that female and male computer scientists do not differ in their academic performance and in their self-assessment of expert knowledge at time of graduation. Women are even slightly superior in terms of their academic

performance at university. In the professional assessment, on average, men rate themselves slightly better, although the difference is not significant. Although men and women seem equally capable, they differ significantly in their actual satisfaction with confidence. On average, men are significantly more satisfied with their confidence. This finding is attributed to gender stereotypes (Beyer, 1990, 2016; Kling et al. 1999; Spurk & Abele, 2014; Ertl, Luttenberger & Pächter, 2017).

Deeply rooted gender stereotypes have a major impact on how men and women perceive themselves and judge their abilities. In Germany, computer science is male dominated and technical skills are attributed to men (Eccles et al., 1983; Lent, Brown & Hackett, 1994; Bandura, 1997; Abele, 2002, 2003a, 2003b; Abele & Spurk, 2009; Abele, Spurk & Vollmer, 2011; Hannover & Kessels, 2004; Brauner et al., 2010; Kosuch, 2010; Schmid, Gärtig-Daugs & Förtsch, 2015). Male computer scientists believe in a natural talent for technical fields and rate their self-confidence highly. Even with a lower assessment of their expert knowledge at time of graduation, men are still strongly self-confident. Conversely, only women who are more focused on their objective performance at university are satisfied with their confidence. It seems that women assess their abilities more realistically compared to men. This finding is consistent with many studies demonstrating that women underestimate their abilities, even if there is no difference in academic performance, solely because these abilities are attributed to men (Marsh & Yeung, 1998; Klieme, 2000; Bescherer, 2003; Skaalvik & Skaalvik, 2004; Hannover & Kessels, 2004; Skorepa & Greimel-Fuhrmann, 2009; Cheryan et al., 2015; Kessels, 2012; Sáinz & Eccles, 2012; Smith et al., 2012; Ertl et al., 2017; Weinhardt, 2017).

In addition, our empirical study reveals that young professionals are significantly less satisfied with their confidence. Our findings show significant gender differences for the cohort who graduated between 2011 and 2014. Female computer scientists who have just entered the labor market are more dissatisfied compared to their male counterparts. One reason for this finding could be that women are uncertain about career planning at an early stage of their career Carter & Silva, 2011; Elprana et al., 2012; Edding, 2014). At this point, it seems that women need more support compared to men in order to aspire higher career positions. It takes activities that help women to identify their competences and become aware of their strengths such as utilizing a personal mentor, a mentoring or coaching program and networking (Edding, 2014).

Another important result is the fact that almost all of the men (over 96%) who graduated in a study program with less emphasis on informatics are highly satisfied with their self-confidence. For women this figure is only 79%. About 80% of the men who graduated in applied computer science, a study program with more emphasis on informatics, feel satisfied with their confidence and only half of the women with a degree in this study program rate this personal characteristic positively. Although the gender effect is not significant, perhaps attributable to the number of women in our sample, the result shows the direction of the trend: Women with a degree in applied computer science, a male dominated area with high technical requirements such as programming, are less satisfied with their self-

confidence. Again, we suspect the effect of gender stereotypes. Female computer scientists believe that they are less capable in professions with high technical standards due to gender stereotypes, (Bandura, 1997; Wigfield & Eccles, 1992; Eccles et al., 1983; Eccles, Wigfield & Schiefele, 1998; Eccles & Wigfield, 2002).

LIMITATIONS

We can observe in our findings that women are less satisfied with their self-confidence compared to men. One important finding of our study is that lower satisfaction with self-confidence is related to lower career ambitions of women. Women who are less satisfied with their self-confidence are less interested in taking a job with leadership responsibilities. This, in turn, may influence the career ambition and occupational development of female and male computer scientists (Abele, 2002; 2003a, 2003b; Aisenbrey & Brückner, 2008; Abele & Spurk, 2009; Abele, Spurk & Vollmer, 2011; Spurk & Abele, 2014; Förtsch et al. 2018). However, we have to keep in mind that it is not possible to truly measure confidence and satisfaction with confidence. We are only able to measure self-reports which may be biased. Therefore, we do not know if the findings are due to actual gender differences in confidence or gender differences how individuals report their satisfaction with confidence. Previous research has shown that career ambitions and career development of women are a complex interplay of social and psychological barriers. Women often tend to lower self-assessments (Sieverding, 2003). This may be also true for satisfaction with self-confidence and is due to further investigation. Nevertheless, we would like to point out that women need more support to achieve their career goals. This situation requires measures that will encourage and support women in particular in their personal career development. Thus, we implemented a coaching program for female computer scientists at different stages of their career. The following practical measure shows the support of coaching and the personal benefit for the individual's career.

DEVELOPMENT OF A COACHING PROGRAM AS A CONSEQUENCE OF THE FINDINGS OF THE ALUMNAE TRACKING STUDY

The finding that women are more dissatisfied with their self-confidence compared to men and that this affects their career development suggests that women need more support to achieve their career goals. This assumption can also be attributed to the fact that women are less often offered career-promoting measures. When we asked the participants of our quantitative study if they were involved in career-promoting measures, such as coaching or mentoring, over 89 percent of the men were involved in such programs whereas only just over 10 percent of the women were using supporting measures. In an open question of the Alumnae Tracking Study`s questionnaire concerning desired supporting measures, the women named coaching and mentoring to plan their careers. Therefore, a supporting measure like a coaching program was implemented as a further element of the support measures for women's careers in CS at the Faculty of Information Systems and Applied Computer Sciences.

TARGET OF THE COACHING PROGRAM

The target of the practical program is to strengthen the self-confidence and motivational resources of CS graduates because it is known that strong self-

confidence is considered a predictor of career success (Lent, 1986, Abele, 2013). Coaching in a professional context is suitable to encourage women to reflect on their career path and to set career goals (Klaffke, 2011). This means coaching could open new perspectives and change behavior. This changing process is successful if the coaches feel self-confident. Self-confidence is known as the most important factor for motivation and the regulation of behavior (Bandura, 1986)**.** In addition, personal determinants such as gender, abilities, and environmental factors are seen as predictors for professional success as well as for professional satisfaction and life satisfaction (Lent, 1986, Abele, 2013). An important aspect of life satisfaction is satisfaction with self-confidence (Fahrenberg et al., 2000).

TARGET GROUP

The coaching program was offered to all female computer scientists who participated in the quantitative study. Fifteen women (between 24 and 40 years old) decided to take part in the coaching program. They had all graduated with a degree in applied computer science, information systems or computer science courses with less emphasis on informatics.

METHODOLOGICAL BASIS AND STEPS OF THE COACHING PROGRAM

The coaching program is divided into the following different sub-steps.
For the first step in our coaching program, we used the Bochumer Inventar for professional descriptions of personalities (BIP)[2]. The BIP is a reliable and valid personality test for professional applications. The BIP was constructed at a German university that analyzes the competitiveness of employees.

The BIP is used by personal manager for recruiting new employees and by job counsellors for career development. The test is carried out to assess job-related characteristics of the participants. The individual results can be compared to different reference groups, for example female professionals or women in leadership positions. The consistent consideration of the perspective of participants is one of the special strengths of the test. The BIP is one most German personality test for professional applications as reliable and valid certified (Marcus, 2006). The personality test was optionally offered for individual coaching. All 15 participants decided to participate in the personality test. The consistent consideration of the perspective of participants is one of the special strengths of the test.

Fourteen personality traits, belonging to four personality areas, are analyzed (Hossiep & Paschen, 2003). Those include the following facets such as **professional orientation and career ambition:** achievement motivation, motivation to shape, leadership ambition; **work behavior:** conscientiousness, flexibility, activity orientation; **social competencies:** sensitivity, interpersonal skills, sociability, teamwork, assertiveness; **mental condition:** emotional strength, physical resilience, and self-confidence. The BIP questionnaire includes 210 items that have to be ranked by the test person on a six-point scale from „strongly agree" to „strongly disagree". Fourteen personality traits, belonging to four personality areas, are analyzed (Hossiep & Paschen, 2003). The evaluation of the data took place in a 10-stage standardization whereby each result profile is based on the presented distribution of the comparison group (Figure 5) The gray area shows the

middle area of the reference group. A special focus of the coaching program was the consideration of leadership potential. Thus, the evaluation of the participant's answers is compared to the reference groups of professional and professionals in leadership positions. For the development of potential as a manager, the dimensions of management motivation, achievement motivation, sensitivity, ability to communicate, assertiveness, and self-confidence are particularly relevant (Kanning & Kempermann, 2012). At the individual level, we review the results of the quantitative study to develop support measures for female computer scientists.

The second step includes the individual coaching session. The individual coaching measure is divided into five phases (contact, contract, hypotheses, interventions, and evaluation) according to the person-centered process consultation model. The phases do not have to show a linear course, but are in a systematic relationship to each other (Loebbert, 2017).

1st phase: During the contact and contract phase, the participants were informed about the project and familiarized with the BIP.
2nd phase: Expectations and concrete topics for the coaching session were established. In addition, the results of the BIP were integrated.
3rd phase: In the hypothesis phase, the concerns and goals of the candidates were intensively discussed and considered. This took place both through reflection on the results of the BIP and the individual coaching session.
4th phase: In the intervention phase, new perspectives and possible action steps were worked out together.
5th phase: The evaluation phase consisted of brief feedback from the participants directly at the end of the coaching as well as feedback after a few months as to what extent the plans could be implemented (Loebbert, 2013)

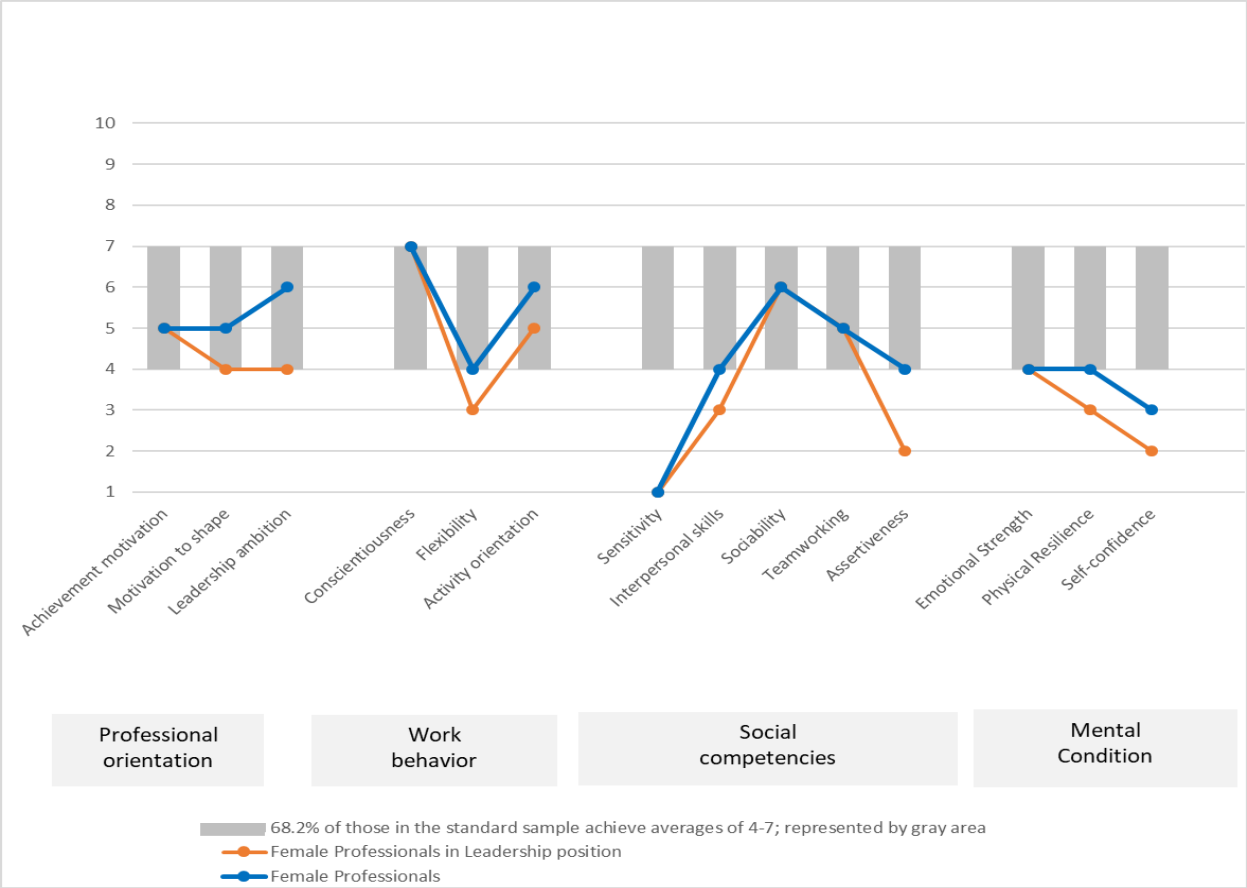
CASE EXAMPLE

Based on the results of the quantitative study and the different requirements that include individual coaching sessions, we would like to present a case example that reflects the connection between career ambitions respectively leadership ambitions and self-confidence.

At the time of the coaching, the coachee was 25 years old and had graduated in information systems in October of 2015. Since November of 2015, she had been working in a small software company. She was responsible for the implementation of technology projects. The professional activity was predominantly customer contact. As a first step on the career ladder, she wanted to get experience in the day-to-day operations. In addition, she planned to reach the management level and was willing to take on responsibility for staff.

For this reason, the personality analysis tool the Business-Focused Inventory of Personality (BIP) was used (1st phase) and the results were interpreted for the reference groups of female professional and female managerial staff (2nd phase). In Figure 5, we present the results of the BIP questionnaire. A special focus of the

coaching is on management potential. Indicators for management potential are high levels of the dimensions leadership motivation, achievement motivation, sensitivity, interpersonal skills, assertiveness, and self-confidence. The dimensions conscientiousness, sociability, and teamwork should lie in the mid-range (Kanning & Kempermann, 2012).



Source: Our own illustration based on data from the study of Career Coaching in STEM.

Figure 5: Evaluation BIP, young professional with the goal to achieve a leadership position.

The results of the test are interpreted according to the guidelines of the BIP (Hossiep & Paschen, 2003). Figure 5 shows the results of the coachee in comparison to both referential groups of female professionals and female professionals in leadership positions (blue and orange lines). At first, we analyzed the outcomes compared to the reference that is relevant for professionals in leadership positions. Particularly the important dimensions, as explained above, for the coachee are as follows: Leadership motivation lies in the lower limit of the average and achievement motivation lies on the average compared to the reference group. With regard to sensitivity, we noted a very low factor (1 out of 10). People

with low values on this scale are uncertain in different social situations. For example, it is difficult for them to assess the emotional condition of customers. Accordingly, they are uncertain of their own behavior. Therefore, it is important for the coachee to get realistic feedback from others about their behavior. Coaching, for example, would be helpful in this case (Hossiep & Paschen, 2003). The factor for interpersonal skills is also low (3 out of 10). For people with a low value on this scale is it difficult to engage or network with others. If the person holds a leadership position, it is advisable to support them with intervention measures that promote agency (Hossiep & Paschen, 2003). Regarding assertiveness and self-confidence, we also observe a low level (2 out of 10). Assertiveness corresponds with the hierarchical position in the company but is also associated with self-confidence. Since the coachee is at the beginning of her professional career, the low assertiveness is not surprising. Especially at the beginning of employment, it is necessary for young professionals to familiarize themselves with the traditions of the company. The position of the employee is not yet well established. Those with a low value on self-confidence are unsure of their abilities and worried about their image. Professional positions with a high level of management responsibility could be a problem for the coachee (Hossiep & Paschen, 2003).

Regarding the dimensions conscientiousness, sociability, and teamwork, we can recognize the following outcomes: conscientiousness lies at the upper end of the average (7 out of 10) compared to the reference group of managerial staff. The social competencies of sociability and teamwork are around average as is advantageous for people in leadership positions. A high score on conscientiousness suggests the coachee is very reliable. Conscientiousness is correlated with income and leadership motivation. In conclusion, employees with management responsibilities have to see the big picture and not lose themselves in details (Hossiep & Paschen, 2003). When considering the reference group of managerial staff, it should be remembered that the people in this group have already achieved the goal of a leadership position whereas the coachee wants to climb up the career ladder in the future.

Compared to the reference group of professionals, the characteristics scores are almost all higher. The outcomes of the BIP suggest that the coachee should gain more professional experience as it is her first job. During the first two years, it is important to learn about the corporate culture of the company and to meet and network with new colleagues. Based on her high level of expert knowledge, a leadership career can be aspired to. In the case of the coachee, coaching will be an advantage and could support her to a higher level in her personal career development. As part of the coaching session, it was clarified how the BIP fits the self-image of the coachee. The results of the BIP did not surprise the coachee. She stated that she had long been dissatisfied with her self-confidence and wanted to improve it. In difficult situations, she wanted to remember how she solved tough tasks in the past. She wanted to transfer this positive experience to the current situation. With improved self-confidence she will be able to be more proactive. In order to increase her expert knowledge, she would like to participate in further training within the company (3rd phase).

In the individual coaching session the SMART method was used for career planning (4th phase). That means the career goal must be specific, measurable, achievable, relevant, time limited (Drucker, 1977; Brühwiler, 2016). It was clearly stated by the participant that she would like to take on (specifically) a team leader position (measurable) in 2-3 years (timed). This position seemed very attractive for her because it allows independent work and leads to freedom of decision making (attainable). She also wanted to take responsibility. Her actual career path allows her to reach this goal (relevant). After the probationary period, she will take over her own project, which will be followed by another one later in the year. Thus, the first step is achievable and, in fact, almost achieved. At the end of the temporary career ladder is the goal of becoming a team leader. The participant herself says that she probably will not achieve this goal within the current company because it is a small company, the respective positions are already filled, and the existing age structure does not allow her to reach team leadership. This means that she will change employer for the preliminary final step of her career planning. She also wanted to work on her self-confidence by remembering in difficult situations what it was like when she mastered a similar situation. Thus, she wanted to transfer a positive experience to the upcoming task. From this, confidence can grow to show even more job initiative.

In this context, it was discussed if it is helpful for the coachee to have a personal mentor who supports her and introduces her into social networks. With regard to the results of our quantitative questionnaire, we could observe that women are very interested in a personal mentor; however, men are more often provided with the support of a personal mentor for their career development (Förtsch, Gärtig-Daugs & Schmid 2015). We also discussed possible participation in communication training. This would be an opportunity to learn strategies and tools to handle conflict situations. Thus, she could get a clear vision of her own behavior and find alternative ways to solve problems. She could identify particular triggers for conflicts and defend herself better against verbal attacks.

After three months, we contacted the coachee again. Based on the individual career plan that had been developed during the coaching session, we asked which steps had been implemented (5th phase). The coachee was allowed to respond to the questions in an open manner and gave written feedback. The coaching program was evaluated by a content analysis according to Mayring (2003). The coaching was rated as successful if the next career steps had been achieved or if new perspectives had evolved.

The coachee described her current job situation as follows:

> *"In the meantime, I have been able to work on new projects and have also been involved in larger projects in which I can also assume organizational tasks." In three days I have my next special training with final certification" (Coachee).*

She was able to take over new tasks and more responsibilities. This indicates that she was successful in working on her self-confidence. The current work situation of

the coachee did not change organizationally. Due to the high workload, she had little time for additional training outside of the company such as communication training. However, the coachee had her career goals clearly in mind and followed them systematically to reach further stages of her career:

> *"The conversation was very helpful to put the goals on a timeline. My career ambitions are still the same. I want to move up to a leadership position. I will spend one or two years in the current company to gain further practical experience. After this time, I will have a look at the job market for more career opportunities. The current company is too small to support me in this direction" (Coachee).*

Other participants of the coaching program explicitly stated that the measure contributed not only to the clarification of career goals but also to the strengthening of self-confidence.

> *"I realize that my self-confidence hindered my success. This problem is also typical for women, men do not think about if they are good enough. During the coaching session, I had an "Aha-experience." It is up to me to find the courage to implement this knowledge" (Coachee 1).*
>
> *"The coaching talk certainly strengthened my self-confidence once again. I have actually managed to say "no" more often and yet to advance my ideas" (Coachee 2).*

It is often up to the immediate supervisor to provide career opportunities, motivate, and offer support measures. Another participant of our coaching program reported that she had to send stronger signals compared to men to reach the management level. Gender stereotypes such as…

> *"The field of computer science is not a profession for women" (another Coachee).*

…require a high level of self-confidence and assertiveness. Female computer scientists can clearly feel the glass ceiling. The high levels of competition in male dominated areas causes women to not feel as competent in the profession of computer science. Even if women have the potential to achieve a leadership position, they are uncertain about their competences and abilities. In this case, coaching will be a good opportunity for following career ambitions.

CONCLUSION

The results of the quantitative study have led to the development of the practical measure of coaching. With the individual coaching program, it is possible to encourage women to follow their career goals. Especially at the beginning of a professional career, but also throughout the entire career, female employees need support to use career opportunities. The results of our quantitative analysis show

that women are more dissatisfied with their self-confidence as compared to men, and that women are less interested in leadership positions. However, companies offer men more than women the opportunity to participate in career development measures (Förtsch, Gärtig-Daugs & Schmid 2015). Again, gender stereotypes are in evidence: Men are considered to have higher productivity by their employers as, for example, men take less parental leave compared to women. Women have to send strong signals to convince their employers they are worthy of career advancement (Spence, 1973). Individuals whose potential is highly rated by employers have the greatest chance to participate in career measures.

ENDNOTES

[1] Due to our small sample size, we had to create dummy variables for both graduates' "objective" abilities, self-assessment of expert knowledge in computer science and satisfaction with self-confidence. For "objective" abilities, we differentiate between graduates who achieved excellent grades at university and those achieving more modest results. Regarding the self-assessment of expert knowledge in computer science, we differentiate between participants who report a very high or high level of expertise and those reporting only average or lower level of expertise. In a similarly way, we operationalized satisfaction with self-confidence: We differ between graduates who are satisfied with their self-confidence and graduates who are dissatisfied regarding their self-confidence.

[2] The Business- Focused Inventory of Personality Bochum (BIP, Hossiep & Paschen, 2003) is a psychological test that systematically records occupational personality traits. For this purpose, the participant is presented with statements that they should judge in terms of the personal validity of the statements. The answers are summarized on the basis of relevant professional dimensions in each case to numerical values, represented graphically by means of a profile sheet and summarized in a psychological report. BIP can be applied in different contexts, such as e.g. in coaching measures.

REFERENCES

Abele, A. E. (2002). Ein Modell und empirische Befunde zur beruflichen Laufbahnentwicklung unter besonderer Berücksichtigung des Geschlechtsvergleichs. *Psychologische Rundschau*, 53(3), 109–118.

Abele, A. E. (2003a). The Dynamics of Masculine-Agentic and Feminine-Communal Traits: Findings from a Prospective Study. *Journal of Personality and Social Psychology*, 85(4), 768–776.

Abele, A. E. (2003b). Beruf – kein Problem, Karriere – schon schwieriger: Berufslaufbahnen von Akademikerinnen und Akademikern im Vergleich. In: A. E. Abele, E.-H. Hoff & H.-U. Hohner (Hrsg.). *Frauen und Männer in akademischen Professionen. Berufsverläufe und Berufserfolg*. Heidelberg: Asanger.

Abele, A. E., & Spurk, D. (2009). How do Objective and Subjective Career Success

interrelate Over Time? *Journal of Occupational and Organizational Psychology*, 82(4), 803–824.

Abele, A. E., Spurk, D., & Volmer, J. (2011). The Construct of Career Success: Measurement Issues and an Empirical Example. *Journal of Labour Market Research*, 43, 195–206.

Aisenbrey, S., & Brückner, H. (2008). Occupational Ambitions and the Gender Gap in Wages. *European Sociological Review*, 24(5), 633–649.

Arbeitsmarkt aktuell DGB (2010). Junge Frauen am Arbeitsmarkt: Gut qualifiziert, oft aber schlecht bezahlt.

Athenstaedt, U. (2002). Gender role self-concept, gender role attiudes and the participation in gender-typed vocational and leisure sport courses. *Psychologische Beiträge*, *44,* 585–595.
Athenstaedt, U., & Alfermann, D. (2011). *Geschlechterrollen und ihre Folgen. Eine sozialpsychologische Betrachtung*. Stuttgart: Kohlhammer.

Athenstaedt, U., & Mikula, G. (2008). Haben es männliche Führungskräfte bei der Bekanntagabe negativer Entscheidungen leichter als weibliche? Zu den Folgen von Gerechtigkeitsvorstellungen und geschlechtersterotypen Erwartungen an Führungskräfte. *Wirtschaftspsycholgie*, *2*, 65–75.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, Prentice Hall, NJ.

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York: W. H. Freeman Times Books Henry Holt.

Bénabou, R. & Tirole, J. (2001). Self-confidence and personal motivation. Princeton. https://www.princeton.edu/~rbenabou/papers/papers/CONFQJE2.pdf (accessed 20 May 2019).

Berdousis, I., & Kordaki, M. (2015). Gender differences and achievement in computer science: A case study. *Procedia - Social and Behavioral Sciences*, *191*, 1161–1166. doi:10.1016/j.sbspro.2015.04.233.

Bescherer, C. (2003). *Selbsteinschätzung mathematischer Studierfähigkeit von Studienanfängerinnen und Studienanfängern: Empirische Untersuchung und praktische Konsequenz*. Ludwisgburg: Pädagogische Hochschule Ludwigsburg.

Beyer, S. (1990). Gender Differences in the Accuracy of Self-Evaluations of Performance. *Journal of Personality and Social Psychology*, 59 (5), 960-970.

Beyer, S. (2016). Women in CS: Deterrents. In P. A. Laplante (ed.). *Encyclopedia of Computer Science and Technology.* doi: 10.1081/E-ECST2-120054030.

Bordalo, Pedro, Katherine Baldiga Coffman, Nicola Gennaioli, & Andrei Shleifer (2019). "Beliefs about Gender." American Economic Review 109, no. 3 (March 2019): 739–773.

Boye, K. (2009). Relatively different? How do gender differences in well-being depend on paid and unpaid work in Europe? *Social Indicators Research*, *93*, 509–525.

Brauner, P., Leonhardt, T., Ziefle, M., & Schroeder, U. (2010). The Effect of Tangible Artifacts, Gender and Subjective Technical Competence on Teaching Programming to Seventh Graders. In: D. Hutchison, T. Kanade, J. Kittler, J. M. Kleinberg, F. Mattern, J. C. Mitchell, & J. Vahrenhold (Hrsg.). *Teaching Fundamentals Concepts of Informatics*. Berlin: Springer, 61–71.

Brown, S. & Lent, R. (2005). Career development and counseling. Putting theory and research to work. Hoboken: Wiley.

Brühwiler, B. (2016). SMART Ziele setzen und erreichen: Erfolg durch neue Gewohnheiten.

Carter, N. M., & Silva, C. (2011). The myth of the ideal worker. Does doing all the right things really get women ahead? New York u.a. 2011 http://www.catalyst.org/file/523/the_myth_of_the_ideal_worker_does_doing_all_the_right_things_really_get_women_ahead.pdf (accessed 18 May 2019).

Cheryan, S., Plaut, V., Davies, P. & Steele, C. (2009). Ambient belonging: How stereotypical cues impact gender participation in computer science. Journal of Personality and Social Psychology, 97 (6), 1045-1060.

Cheryan, S., Siy, J. O., Vichayapai, M., Drury, B. J., & Kim, S. (2011). Do Female and Male Role Models Who Embody STEM Stereotypes Hinder Women's Anticipated Success in STEM? Social Psychological and Personality Science, 2(6), 656–664.

Cheryan, S., Master, A., & Meltzoff, A. N. (2015). Cultural Stereotypes as Gatekeepers: Increasing Girls' Interest in Computer Science and Engineering by Diversifying Stereotypes. *Frontiers in Psychology,* 6, 49.

Claffey, S. T., & Mickelson, K. (2009). Divison of household labor and distress: The role of perceived fairness for employed mothers. *Sex Roles*, *60*, 819–831.

Dette, D. E. (2005). Berufserfolg und Lebenszufriedenheit. Eine längsschnittliche Analyse der Zusammenhänge [Career success and life satisfaction. A longitudinal analysis of their relationship]. urn:nbn:de:bvb:29-opus-1626.

Drucker, P. F. (1977). *People and Performance. The Best of Peter Drucker on Mangement.* Harper's College Press, new York 1977

Eccles, J. S. (1983). Expectancies, Values and Academic Behaviours. In: J. T. Spence (Hrsg.). *Achieve-ment and Achievement Motives: Psychological and Sociological approaches*. San Francisco: Freeman, 75–145.

Eccles, J. S., Wigfield, A., & Schiefele, U. (1998). Motivation to Succeed. In: N. Eisenberg & W. Damon (Hrsg.). *Handbook of Child Psychology: Social, Emotional, and Personality Development.* Hoboken: Wiley, 1017–1095.

Eccles, J., & Wigfield, A. (2002). Motivational Beliefs, Values, and Goals. *Annual Review of Psychology*, 53, 109–132.

Eckes, T. (2008). Geschlechterstereotype: Von Rollen, Identitäten und Vorurteilen. In: R. Becker, & B. Kortendiek (Hrsg.). Handbuch Frauen- und Geschlechterforschung. Theorie, Methoden, Empirie. Wiesbaden: VS Verlag für Sozialwissenschaften, 165–176.

Edding, C. (2014). Was wünschen sich Frauen von ihrer Arbeit? Literaturrecherche

im Auftrag der Bertelsmann Stiftung. https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/GP_Was_wuenschen_sich_Frauen_von_ihrer_Arbeit.pdf (accessed 18 May 2019).

Elprana, G., Stiehl, S., Gatzka, M., & Felfe, J. (2012). Gender Differences in Motivation to Lead. A Germany-Wide Interview Study. In: Quaiser-Pohl & Endepohls-Ulpe (Hrsg.). *Women's Choices in Europe – Influence of Gender on Education, Occupational Career and Family Development.* Münster: Waxmann, 135–150.

Ertl, B., Luttenberger, S., & Paechter, M. (2017). The Impact of Gender Stereotypes on the Self-Concept of Female Students in STEM Subjects with an Under-Representation of Females. *Frontiers in Psychology,* 8, 703.

Fahrenberg,J., Myrtek, M., Schuhmacher, J.,Brähler, E. (2000). FLZ. Fragebogen zur Lebenszufriedenheit. Göttingen.

Förtsch, S., Gärtig-Daugs, A., & Schmid, U. (2015). Unternehmenskulturen im Wandel - Karriereentwicklung im Informatikbereich. Ergebnisse des Forschungsprojekts Alumnae Tracking, Bamberg.

Förtsch, S., Gärtig-Daugs, A., Buchholz, S., Schmid, U. (2018). Keep it going, Girl! An Empirical Analysis of Gendered Career Chances and Career Aspirations Among German Graduates in Computer Sciences. International Journal of Gender, Science and Technology, Vol 10, No 2 (2018), 265-286.

Goldin, C. (2014). A Grand Gender Convergence: Its Last Chapter. *The American Economic Review*, 104(4), 1091–1119.

Gorman, E., & Kmes, J. (2007). We (Have to) Try Harder: Gender and Required Work Effort in Britain and the United States. Gender & Society, Vol. 21 (6), 828-856.

Hannover, B., & Kessels, U. (2004). Self-To-Prototype Matching as a Strategy for Making Academic Choices. Why High School Students Do Not Like Math and Science. *Learning and Instruction*, 14, 51–67.

Holland, J. L. (1985). *Making Vocational Choices: A Theory of Vocational Personalities and Work Environments*. Englewood Cliffs: Prentice-Hall.

Hossiep, R. und Paschen, M. 2003. Bochumer Inventar zur berufsbezogenen Persönlichkeitsbeschreibung, Manuel Loebbert, M. 2017. Coaching Theorie. Eine Einführung. Springer, Fachmedien.
Jacobs, J. A. (1989). *Revolving Doors: Sex Segregation and Women's Careers*. Redwood City: Stanford University Press
James, W. (1890). Principles of Psychology. Vol. 1. New York: Henry Holt & Co.

Jünnemann, A.-K. (2015). Selbstwert und Selbstvertrauen. In D. Frey (Ed.). Psychologie der Werte. Springer, Berlin/Heidelberg, 187–199.

Kanning, U. P. und Kempermann, H. 2012. Fallbuch BIP. Das Bochumer Inventar zur berufsbezogenen Persönlichkeitsbeschreibung in der Praxis. Hogrefe, Göttingen [u.a.].

Kessels, U. (2012). Selbstkonzept: Geschlechtsunterschiede und

Interventionsmöglichkeiten. In H. Stöger, A. Ziegler, & M. Heilemann (Hrsg.). Lehr-Lern-Forschung. Mädchen und Frauen in MINT: Bedingungen von Geschlechtsunterschieden und Interventionsmöglichkeiten. Münster: Lit Verlag, 163–191.

Klaffke, M., (2011). Coaching von führungskräften in Change Mangement Prozessen. *Organsiationsberatung Superversion Coaching* 18 (1), 5-16.

Klieme, E. (2000). Fachleistungen im voruniversitären Mathematik- und Physikunterricht: Theoretische Grundlagen, Kompetenzstufen und Unterrichtsschwerpunkte. In: J. Baumert, W. Bos & R. Lehmann, R. (Hrsg.). *Dritte internationale Mathematik- und Naturwissenschaftsstudie. Mathematische und naturwissenschaftliche Bildung am Ende der Schullaufbahn.* Opladen: Leske & Budrich, 57–128.

Kling, K. C., Hyde, J. S., Showers, C. J., & Buswell, B. N. (1999). Gender Differences in Self-Esteem: A Meta-Analysis. *Psychological Bulletin*, 125 (4), 470–500.

Mayring, P. (2003). *Qualitative Inhaltsanalyse. Grundlagen und Techniken.* Weinheim**:** Beltz.

Kosuch, R. (2010). Selbstwirksamkeit und Geschlecht – Impulse für die MINT-Didaktik. In: Kröll, D. (Hrsg*.). Gender und MINT – Schlussfolgerungen für Unterricht, Beruf und Studium*. Kassel: Universität Kassel, 12–36.

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a Unifying Social Cognitive Theory of Career and Academic Interest, Choice, and Performance. *Journal of Vocational Behavior*, 45 (1), 79–122.

Lent, R. W., Brown, S., & Hackett, G. (2000). Contextual supports and barriers to career choice: A social cognitive analysis. *Journal of Counseling Psychology*, 47, 36–47.

Loebbert, M. 2013. Professional Coaching. Konzepte, Instrumente, Anwendungsfelder. Systemisches Management. Schäffer-Poeschel, Stuttgart.

Loebbert, M. 2017. Coaching Theorie. Eine Einführung. Springer, Fachmedien.

Marsh, H. W. (1986). Verbal and Math Self-Concepts. An Internal/External Frame of Reference Model. *American Educational Research Journal*, 23, 129-149.

Marsh, H., & Yeung, A. S. (1997). Coursework Selection: Relations to Academic Self-Concept and Achievement. *American Educational Research Journal*, 34(4), 691–720.

Mood, C. (2010). Logistic Regression: Why We Cannot Do What We Think We Can Do, And What We Can Do About It. *European Sociological Review*, 26, 67–82.

Möller, J. (2015). Zur Entwicklung und Genese fachbezogener Selbstkonzepte: Effekte sozialer und dimensionaler Vergleiche. In: B. Schenk. (Hrsg.). *Bausteine enier Bildungsgangstheorie,* Wiesbaden: VS Verlag für Sozialwissenschaften, 223 – 238.

Mortimer, J & Lorence, J. (1979). Occupational Experience and the Self-Concept: A Longitudinal Study. *Social Psychology Quarterly* Vol. 42, No. 4 (Dec., 1979), pp.

307-323.

Pavot, W. & Diener, E. D. (1993). Review of the satisfaction with life scale. Psychological Assessment, Vol. 5, No. 2, 164-172.

Pflaum, S. (2017). Mentoring beim Übergang vom Studium in den Beruf. Eine empirische Studie zu Erfolgsfaktoren und wahrgenommenem Nutzen. Wiesbaden: Springer VS Verlag.

Russo, N. F. (1976). The motherhood mandate. *Journal of Social Issues*, 32, 143–154.

Ruiz Ben, E. (2005). *Professionalisierung der Informatik: Chance für die Beteiligung von Frauen? Sozialwissenschaft*. Wiesbaden: Deutscher Universitätsverlag.

Sáinz, M., & Eccles, J. (2012). Self-concept of computer and math ability: Gender implications across time and within ICT studies. *Journal of Vocational Behavior,* 80*(2), 486–499.*

Schmid, U., Gärtig-Daugs, A., & Förtsch, S. (2015). Introvertierte Studenten, fleißige Studentinnen? Geschlechtsspezifische Unterschiede in Motivation, Zufriedenheit und Wahrnehmungsmustern bei Informatikstudierenden. Informatik Spektrum, 38(5), 379–395.

Sax, L. J. (2008). The gender gap in college: Maximizing the developmental potential of women and men. Jossey-Bass. San Francisco.

Schneeweiß, S. (2016). *Wenn die Norm ein Geschlecht hat: Zur Arbeitssituation von Frauen in technischen Berufen in Österreich*. Wien: Arbeitsmarktservice Österreich/Arbeitsmarktforschung und Berufsinformation.

Schreyer, F. (1999). *Frauen sind häufiger arbeitslos — Gerade wenn sie ein „Männerfach" studiert haben*. Nürnberg: Institut für Arbeitsmarkt- und Berufsforschung.

Schulte, A. (1995). Du kannst doch keine normale Frau sein… Über Frauen in gewerblich-technischen Berufen. *Berufsbildung*, 34, 41–44.

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-Concept: Validation of Construct Interpretations*. Review of Educational Research*, 46, 407–444.

Sieverding, M. (2003). Selbstbeurteilungs-Biases in einer simulierten Bewerbungssituation. Women Underevaluate Themselves: Self-Evaluation-Biases in a Simulated Job Interview. *Zeitschrift für Sozialpsychologie*, 34 (3), 147–160.

Skaalvik, S., & Skaalvik, E. M. (2004). Gender Differences in Math and Verbal Self-Concept, Performance, Expectations, and Motivation. *Sex Roles*, 50, 241–252.

Skorepa, M., & Greimel-Fuhrmann, B. (2009). Studienziele und -interesse, Lernmotivation, Lernstrategien und Fähigkeitskonzept von Erstsemestrigen an der Wirtschaftsuniversität Wien. In: M. Stock & G. Mandl (Hrsg.). Entrepreneurship Europa als Bildungsraum Europäischer Qualifikationsrahmen. Wien: Manz Verlag, 191–199.

Smith, J., Lewis, K. Hawthorne, L., & Hodges, S. (2012). When Trying Hard Isn't Natural: Women's Belonging With and Motivation for Male-Dominated STEM Fields

As a Function of Effort Expenditure Concerns. *Personality and Social Psychology Bulletin,* 39, 131–143.

Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, Vol. 87, Nr. 3, 355–374.

Spencer, S. J., Steele, C., & Quinn, D. (1999). Stereotype Threat and Women's Math Performance. *Journal of Experimental Social Psychology*, 35, 4–28.

Spurk, D., & Abele, A. E. (2014). Synchronous and Time-Lagged Effects Between Occupational Self-Efficacy and Objective and Subjective Career Success: Findings from a 4-Wave and 9-Year Longitudinal Study. *Journal of Vocational Behavior*, 84 (2), 119–132.

Steele, C. M. (1997). A Threat in the Air: How Stereotypes Shape Intellctual Identity and Performance. *American Psychologist*, 52, 613-699.

Super, D. E. (1957). *The Psychology of Careers: An Introduction to Vocational Development*. New York: Harper & Row.

Super, D. E. (1980). A Life-Span, Life-Space Approach to Career Development. *Journal of Vocational Behavior*, 16 (3), 282–298.

Weinhardt, F. (2017). Ursache für Frauenmangel in MINT-Berufen? Mädchen unterschätzen schon in der fünften Klasse ihre Fähigkeiten in Mathematik. *DIW Wochenbericht*, 45, 1009–1014.

Wigfield, A., & Eccles, J. S. (1992). The Development of Achievement Task Values: A Theoretical Analysis. *Developmental Review,* 12(3), 265–310.

Wunderer, R. (2004). Selbst- und Fremdvertrauen – Konzepte, Wirkungen und Märcheninterpretationen. *Zeitschrift für Personalforschung* 18 (4), 454–469.