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Gender-specific aspirations and determinants of career development in computer science

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Structure

- **Introduction to the project “Alumnae Tracking”**
- **Determinants of perceived success in computer science programs**
- **Determinants of career aspirations**
- **Determinants of career development**
- **Conclusion**

ESF Research Project "Alumnae Tracking" (October 2012 – March 2015)

- Alumnae Tracking reviews life and career paths of women and men who study at or graduated from the Faculty of Information Systems and Applied Computer Science at the University of Bamberg.
- 50 companies are included in the study. We asked for their corporate culture as well as their programs for career development and work-life balance.

Description of Participants

- First wave:
 - About 200 graduates (12.3% women) and about 100 students (28.5% women).
- Different BA and MA programs:
 - Information Systems (largest group of participants),
 - Computer Science,
 - highly interdisciplinary programs (largest group of females, only few graduates yet).

Empirical Survey

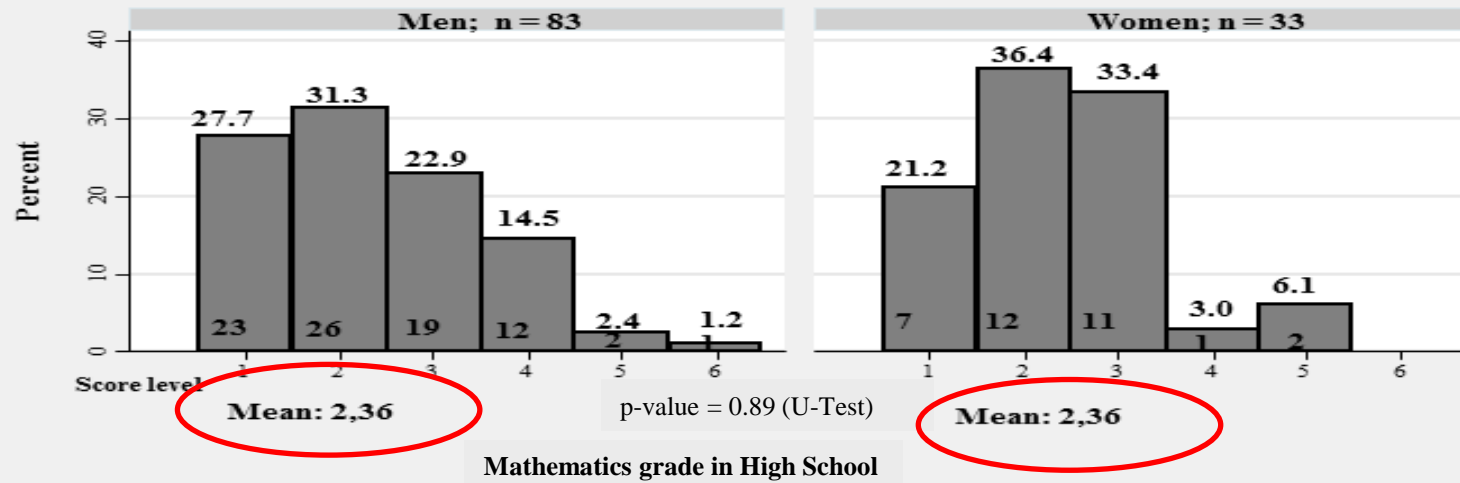
- Analysis of objective criteria such as personal responsibility and income, grades in high school and final degree.
- Analysis of subjective criteria such as life satisfaction and work-life balance.
- Analysis of personal motives and goals for choosing computer science as a career, life goals and work objectives.
- Self-assessments obtained mostly by five points rating scales.

Interesting Aspects...

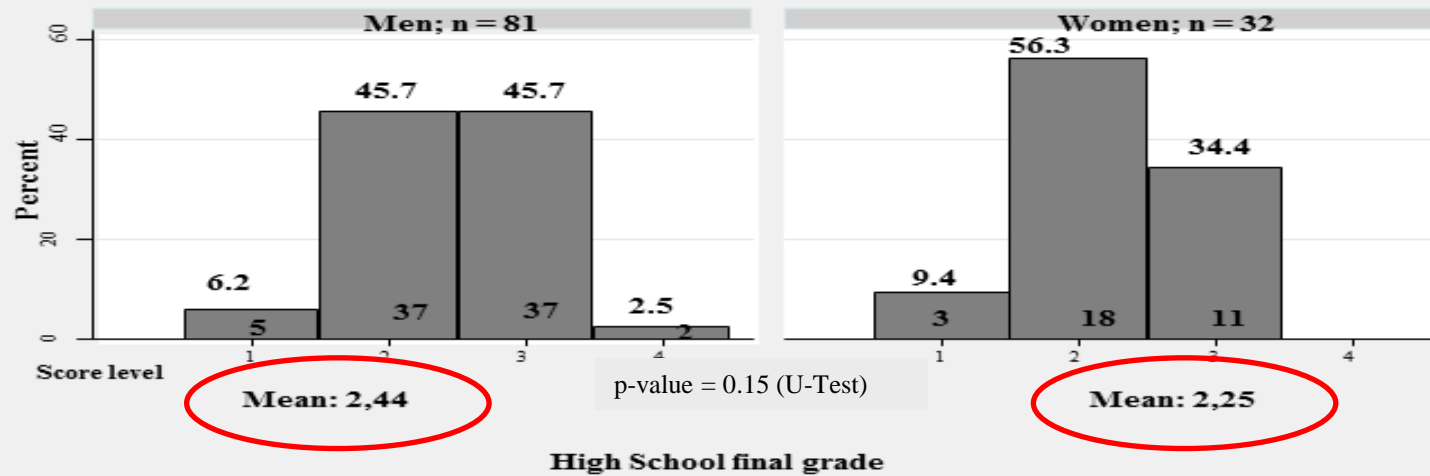
- We suppose that the academic performance from male and female students is different by gender stereotype (Steele, 1997; Marsh 1990).
- We suspect that women underestimate their abilities. This leads to conflicts with their professional and personal goals (Skorepa & Fuhrmann, 2009; Heatherington, et al., 1993).
- Conclusion: women who are working in a male-associated environment do not progress in their professional development as well as men (Abele, 2003).



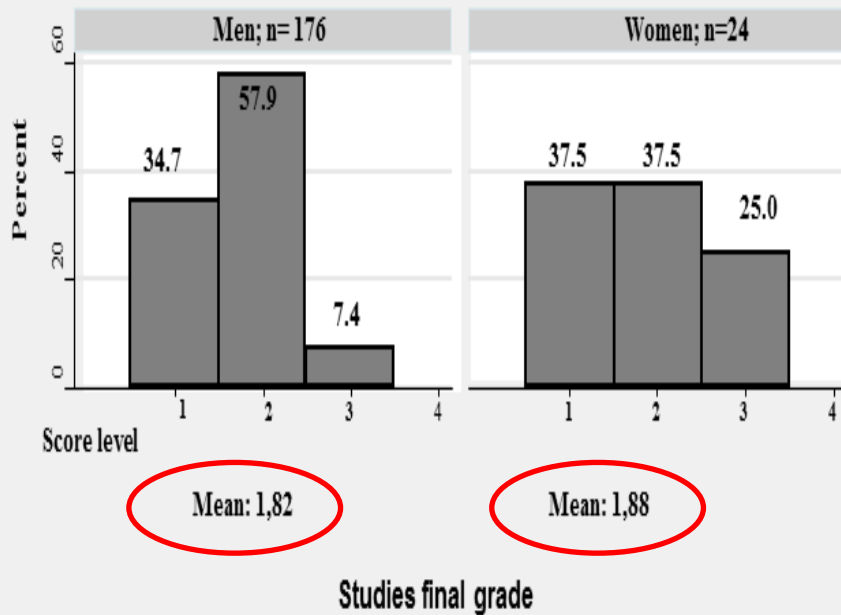
Students of all computer science courses



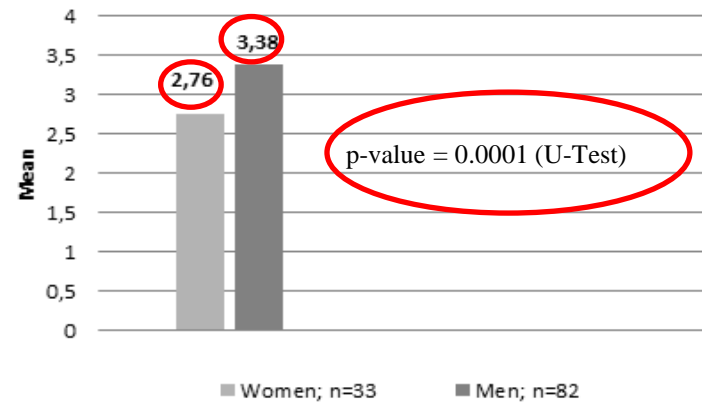
Students of all computer science courses



Graduates of all computer science courses



Self-Assessment of study success



Question...

- What influence has the academic performance on the personal judgment of academic success?

Determinants of perceived success in computer science programs

Estimation results of the logistic regressions for subjective assessment study success

	Modell 3		Modell 4	
Women (1)	0.050***	(0.047)	0.048***	(0.042)
Age	0.950	(0.132)	1.010	(0.131)
Skills				
Mathematics grade in High school (2)	6.170*	(0.158)	6.579**	(5.539)
High School final grade (2)	1.252	(0.773)		
Extrinsic motives				
Income (3)	0.914	(1.068)		
Reconciling career and family life	1.802	(1.416)		
Career opportunities (3)	2.709	(3.465)		
Secure field of work (3)	0.555	(0.595)		
Intrinsic motives				
Aptitude for the subject (3)	2.673	(2.317)	3.686*	(2.547)
Professional interest (3)	2.423	(2.294)		
Social motive				
Opportunity to help other people (3)	0.818	(0.620)		
Programs				
Strongly technical-oriented Bachelor and Master programs (4)	0.016***	(0.024)	0.011***	(0.016)
Bachelor and Master programs in information systems (4)	0.035**	(0.056)	0.020***	(0.029)
Constant	91.324	(345.503)	90.120	(311.083)
Log Lik.	-29.990		-31.454	
Iterations	5		5	
Pseudo-r2	0.3621		0.3310	

*/**/*** Significant at 10/5/1% level

Method by Backward selection*

Number of observations = 108

Source: Alumnae project tracking, student survey first wave; Odds Ratios shown; SE in brackets.

Reference categories : (1) Men; (2) average/low achievement; (3) less important; (4) less technical-oriented Bachelor and Master programs.

Main Results

- There is no significant difference in the academic performance between male and female students.
- However, the female students estimate their personal academic success significantly lower compared to their male students.

Main Results continued

- Students with a good/very good final grade in math have a higher chance of assessing their academic success high.
- Students in strongly technical-oriented programs as well as programs in information systems have a significantly lower chance of seeing their academic success high.
- Students who see talent for the subject as an important criteria for the choice of study have a significantly higher chance of assessing their academic success positively.

Question

If women assess their academic success lower do they also underestimate their leadership capabilities?

Leadership capabilities and women in leading positions

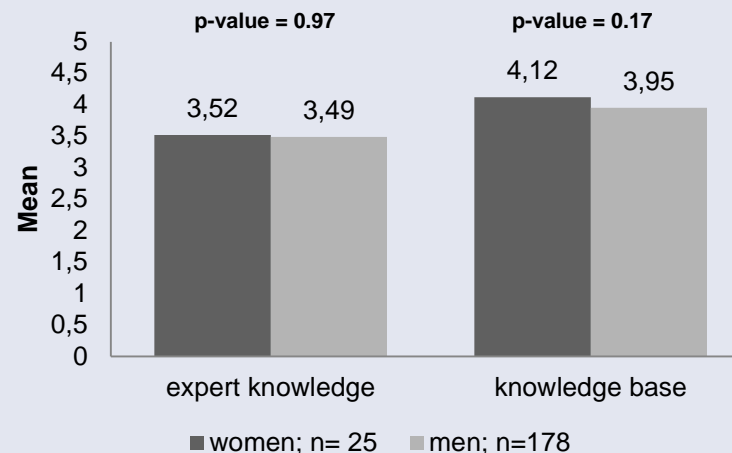
Requirements for the achievement of a leading position:

(Neumann, 2014)

- Qualification (good grades, good expert knowledge and broad knowledge base)
- Soft skills

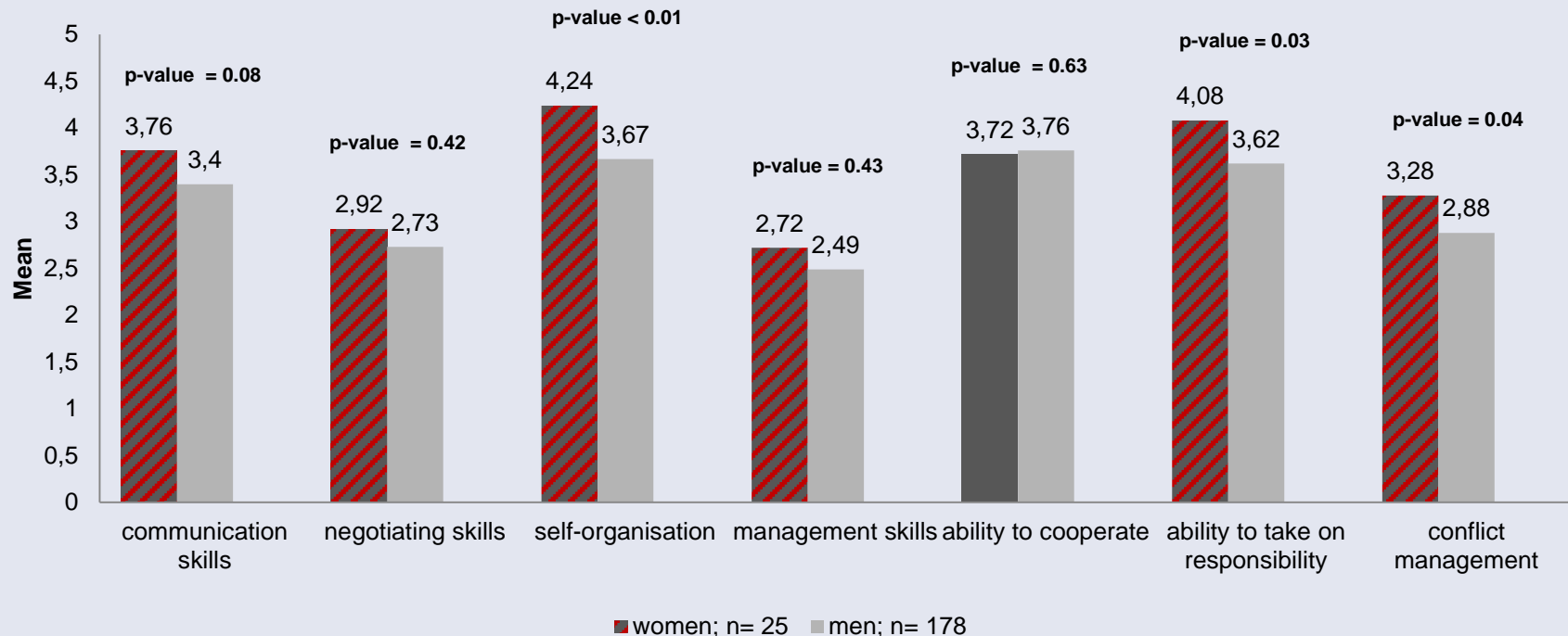
Grades and self-assessment of knowledge as determinants of career aspirations

- Objective findings: Final grades of female graduates are comparable to men.
- Self-assessment of capabilities (retrospective): Women rate their knowledge base and expert knowledge at time of graduation higher than men.

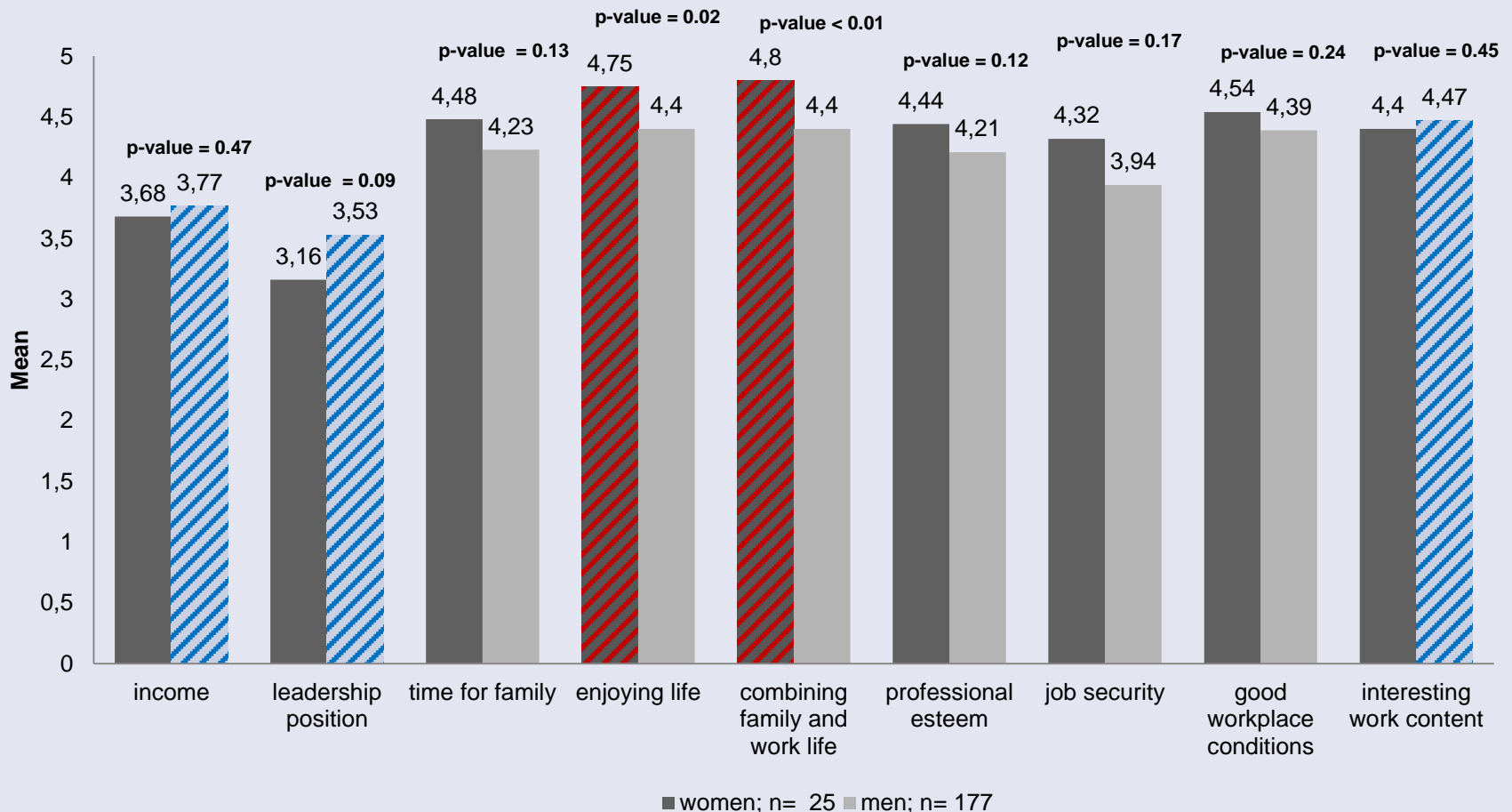


Self-assessment of soft skills as determinant of career aspirations

- Women rate their soft skills higher than men (retrospective).



Professional and personal goals as determinants of career aspirations



Determinants of leadership aspirations

Estimation results of the logistic regression for leadership aspirations

	Modell 1	
	OR	SE
Socio-demographic variables		
Women (1)	0.288**	(0.153)
Year of birth	1.000	(0.467)
Grade and knowledge at time of graduation		
Final grade (2)	0.590	(0.349)
Expert knowledge, broad knowledge base (3)	2.186*	(0.925)
Soft skills at time of graduation		
Communication skills (4)	0.884	(0.332)
Negotiating skills (4)	2.052	(0.998)
Self-organisation (4)	1.014	(0.359)
Management skills (4)	4.565***	(2.183)
Ability to cooperate (4)	0.281***	(0.109)
Ability to take on responsibility (4)	0.915	(0.347)
Conflict management (4)	0.627	(0.2774)
Constant	2.162	(1.561)
Log.Like	-119.460	
Iterations	4	
Pseudo-r2	0.1244	
*/**/** significant at 10/5/1% level		
Number of observations	197	

Source: Alumnae Tracking project, graduate survey, first wave, Odds ratios shown, SE in brackets.

Reference categories: (1) men (2) low achievement (3) average/low knowledge (4) average/low skills

Determinants of holding a leading position

- Predictors:
 - Sociodemographic variables (sex, year of birth)
 - Skills: final grade, knowledge (combined judgement of expert knowledge and knowledge base)
 - Soft skills: management skills, ability to cooperate
 - Work and life goals: leadership position, enjoying life

Determinants of holding a leading position

Estimation results of the logistic regression for leading position

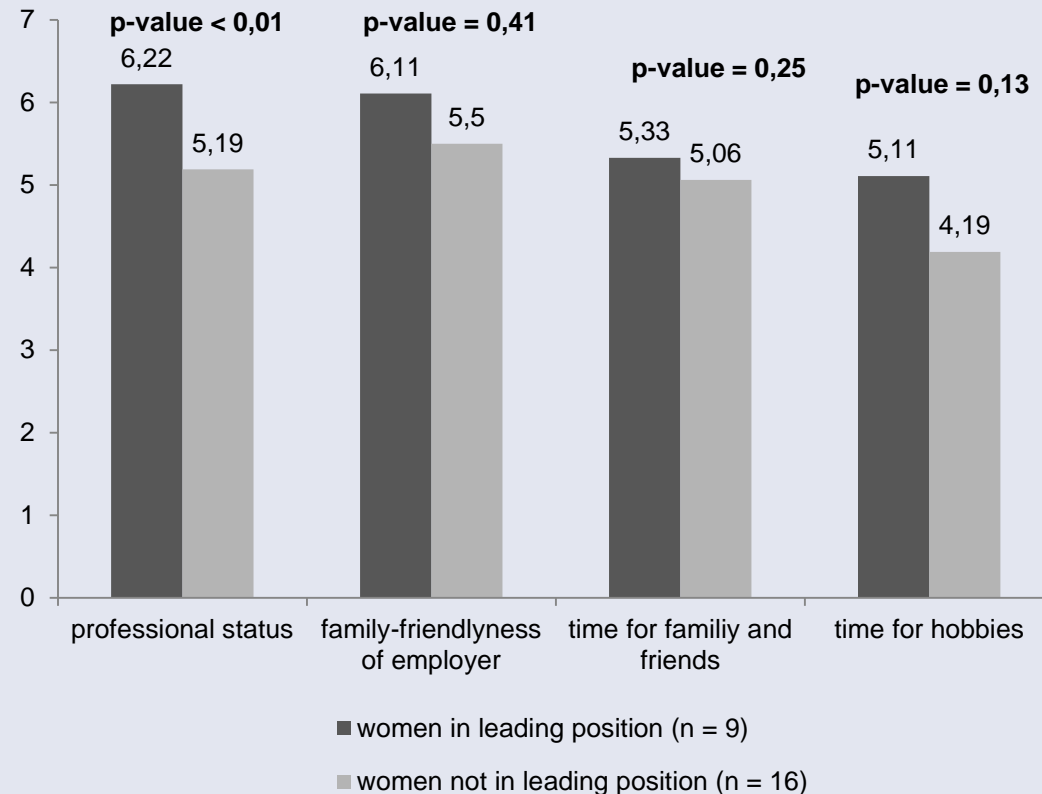
	Modell 1	
	OR	SE
Socio-demographic variables		
Women (1)	0.395*	(0.213)
Year of birth	0.863***	(0.041)
Grade and knowledge at time of graduation		
Final grade (2)	1.321	(0.718)
Expert knowledge, broad knowledge base (3)	1.464	(0.619)
Soft skills at time of graduation		
Management skills (4)	1.325	(0.547)
Ability to cooperate	0.750	(0.275)
Importance of work and life goals		
Leadership position (5)	3.640***	(1.236)
Enjoying life (5)	0.275**	(0.172)
Constant	4.580	(4.284)
Log.Like	-116.449	
Iterations	4	
Pseudo-r2	0.1464	
*/**/** significant at 10/5/1% level		
Number of observations	197	

Source: Alumnae Tracking project, graduate survey, first wave, Odds ratios shown, SE in brackets.

Reference categories: (1) men (2) low achievement (3) average/low knowledge (4) average/low skills (5) average/low importance

Job satisfaction of female graduates by professional status

- Women in executive positions show a higher job satisfaction than women without leading function.



Main Results

- There is no significant difference in leadership capabilities between male and female graduates.
- Perceived management skills at time of graduation are the most important determinant of leadership aspirations.
- Willingness to achieve a leading position is the most important determinant of career development.
- Male graduates attach more importance to the achievement of a leading position.
- Women in leading positions are highly satisfied with their professional status.

Conclusion

- Female students show a high performance but rate their study success low
- → Lecturers should give more positive feedback so that female students develop a more realistic perception of their performance
- Female graduates seek no leadership position because they want to have more time for themselves and their family
- However, women in leading positions are more satisfied than women without leadership function
- → Role models are showing that leading positions are compatible with family and personal life

Literature

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Survey of selected companies

- Best practice examples how to increase the number of women in leading positions -

- Diversity-oriented staff policy → change in corporate culture: time flexibility, home office, part-time leading positions
- Encouragement of women to apply for leadership positions
- “Family“ as career stepping-stone within leadership programs