Gendered study paths

Perspectives on the selectivity of higher education aspirations

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1. Introduction

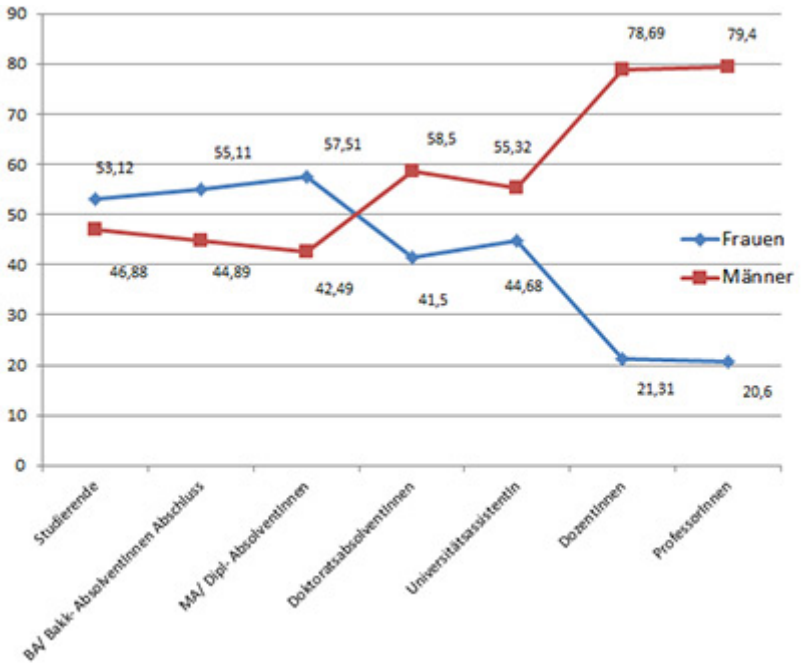
Whereas several forms of inequalities between men and women disappeared during the last decades of the 20th century, occupational segregation of men and women is still an important issue in nearly all societies. Besides several other approaches, segregation theory is commonly used to explain gender differences on the labour market. Two forms of occupational segregation have been identified: Horizontal segregation describes the gender participation regarding different types of occupations, vertical segregation, however, refers to differences between the occupations of men and women regarding status and hierarchy (Charles 2005).

In higher education segregation between men and women is particularly accentuated (Fritsch 2014). According to Leemann/Stutz (2008) scientific careers of women and men can be differentiated by three structural characteristics:

- horizontal segregation along (sub-) disciplines and fields of studies (and afterwards along economic sectors and branches) which is the result of gender specific patterns of choices of subjects (ibid.)
- vertical segregation according to Leeman/Stutz (2008) refers to the disproportional distribution of women and men on the consecutive qualification level (as well as position in hierarchy). These patterns result from gender specific loss rates during the transitions in higher education careers and studies. Van Anders (2004:511) describes this phenomenon as follows “The educational procession of undergraduate students through academia to tenured professorships is referred to as “the Pipeline.” Reductions in group representation (e.g., women, ethnic/racial minorities) at succeeding stages in academia are referred to as “leaks”.”
- Interactions of horizontal and vertical segregation form the third structural characteristic (Leeman/Stutz 2008). The intensity of the “selections processes” in some disciplines seems to be stronger at certain transition points.

Among students in Austria, women account for the majority of students (Unger et al. 2011) and so do they among MA graduates. Afterwards however, the share of women in the respective group of academics constantly declines as career steps rise (Figure 1). Among PhD graduates already, women account for 42% while among MA graduates their share is 58%. The scientific labour market finally is predominantly male with a share of 79% males among lecturers and professors.

Figure 1: "Leaky Pipeline" of academic biography



Source: Robert Czepel, science.ORF.at, 4.7.2014. http://science.orf.at/stories/1741332/, referring to the statistical database of the Ministry of Science.

Most studies on the leaky pipeline concentrate on careers of PhD-graduates and seldom focus on the transition into consecutive Master or PhD-studies which are generally prerequisite for a scientific career (Holzbecher/ Küllchen/ Löther 2002, Leemann 2002).

This paper attempts to make the gender gap in transitions to consecutive studies and the gender specific loss rates among students in Austria visible. The empiric basis of this paper are two main data sources and hereof deducted statistics essentially in a descriptive manner to explore reasons for the gender gap in the continuation of studies in a consecutive study programme (MA after graduation from BA or PhD after graduation from MA).

Additionally, the study “Intentions of enrolling in consecutive study programmes of students at Universities” [translated by the author] of Wejwar et al. (2013) will provide descriptive empirical evidence for reasons and motivations of following a certain study path through different study cycles. Theoretical approaches and results from other empiric studies explaining the leaks in the pipeline will help to embed the empirical findings in a broader, theoretical context, to interpret empirical findings and provide additional possible explanations, pointing towards future research that claims to approach the matter in a more complex way than possible on the grounds of the available data.

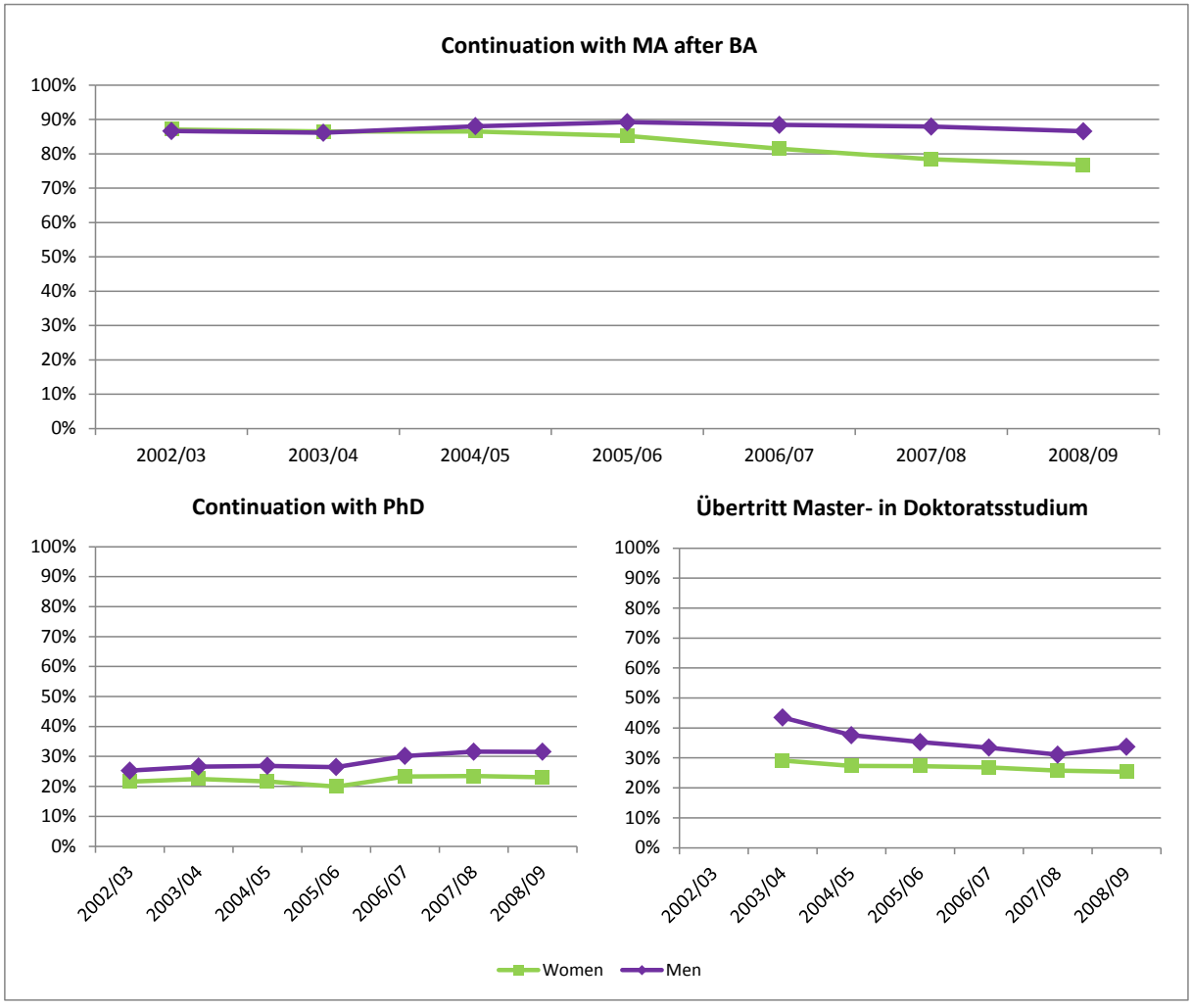
The paper follows a twofold approach of analysis:

- Differences in intentions (women plan to continue studies in consecutive programmes less often than men) and

- differences in successful realisation of these plans. Thus, even if all students would realise their plans, less women would continue their studies. This effect is aggravated by the fact that women seem to continue their studies less often despite planning to do in the first place.

Considering the continuation of studies in a consecutive study programme (MA after graduation from BA or PhD after graduation from MA) male and female students behave differently. A comparison over time shows an increasing gap in transition rates between males and females. Figure 2 shows that women's transition rates have been decreasing more than men's, considering that the overall transition rates of BA students to consecutive MA programmes is relatively high. Considerably lower the transition rates from MA to PhD, where the gender gap seemed to decrease until 2007/08 but started to open up again in 2008/09.

Figure 2: Gender gap in consecutive continuation of studies over time



Source: Studierenden-Sozialerhebung 2011.

2. Gendered study paths

The current analysis is based on two different student surveys conducted in 2011 and 2013. The "Studierenden-Sozialerhebung", an online survey among students, is conducted approximately every 3-4 years since the 1970s. Over 44.000 Students from Universities, Universities of Applied Sciences and Universities of Teacher Education participated in the survey. For enhanced homogeneity of data and hence more comprehensive interpretation, the analysis has only been conducted for students at scientific universities up to the age of 30 years.

In 2013, a survey commissioned by the Austrian National Union of Students has been conducted among students at Universities. The survey focussed on the plans of students to follow a consecutive study career, i.e. planning to continue with a Masters' degree after graduation from a Bachelor programme or to continue with a PhD degree after graduation from a Master programme respectively. Considerably heavy weight was laid on the motivations pro and contra continuing studies with a consecutive programme.

Both surveys sampled students in Austria, though referring to different dates (2011 vs. 2013). Nevertheless, the present analyses can be compared to each other, as there have been no major structural changes that would affect the enrolment in higher education of men and women differently.

As the data available only surveys students at one point in time, the present analysis cannot compare student's attempts of continuing their studies in a consecutive programme (Master after Bachelor or PhD after Master) with their actual realisation thereof. As an approximation, the actual share of women is compared to the fictive gender distribution, assuming all students who plan to continue their studies in consecutive programmes would realise their plans. As we will show, male and female students differ not only in their plans of study continuations but also concerning their actual realisation. Also, the data cannot account for continuation of studies abroad, which means that the continuation rate referred to in this paper is probably underestimated.

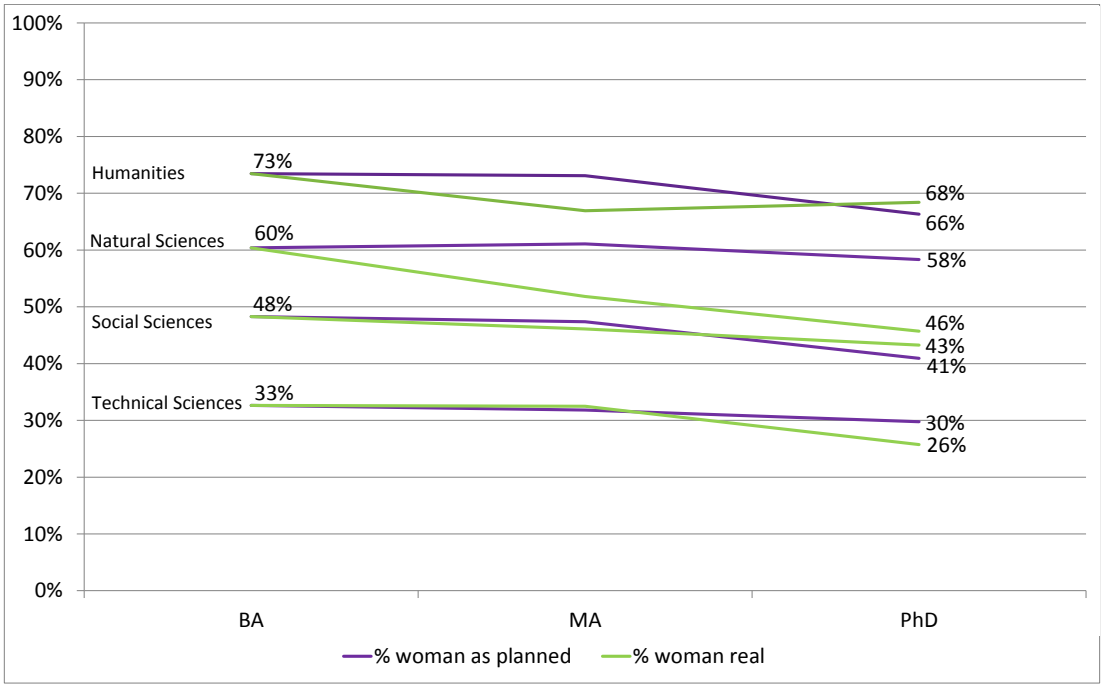
Figure 3 shows the gap between the fictive proportion of women – under the assumption that all students planning to continue their studies actually do so – and the actual proportion of women, separated by fields of studies. For Humanities, we see a total shift of 5% in the gender distribution between Bachelor and PhD with less women ending up in a PhD programme. The two lines clearly show, that the decline in the share of women takes place between BA and MA already, contradicting the distribution as it were, given all students would actually realise their plans. These findings, however, do not consider the gender distributions of students that go abroad to continue their studies after their Bachelor degree. What can be stated though is that relatively more women than men enrol in a PhD programme in Austria after having graduated abroad (share of women 71% graduated abroad vs. 63% not graduated abroad), which would partly explain the rise in the share of women between MA and PhD.

In natural sciences we see a linearly increasing gap between the fictive and the real gender distribution. Under the assumption that all students would realise their plans of continuing their studies in consecutive programmes, the share of women would remain more or less the same among Bachelor- and among PhD students. In fact though, the actual gender distribution shifts by 15% from a female majority among Bachelor students to a male majority among PhD students.

In social sciences, the share of women among PhD students is only a little lower than among BA students. Moreover, there is hardly any difference between the fictive distribution as it were if all plans would be realised and he actual gender distribution. One may conclude that the gender differences in transition to consecutive programmes are minimal in social sciences.

For technical sciences, we see a similar pattern at least as far as the transition from Bachelor to Master is concerned. Both the fictive and the actual gender distribution remain constant, which indicates that there are hardly any selection mechanisms. These come into play only for the transition from Master to PhD studies: while the distribution would not change if all students who plan to enrol in a PhD after graduation from a Master, the gender distribution in fact shifts by 7%, aggravating the male superior number in technical Sciences.

Figure 3: Fictive and real share of women in BA, MA and PhD studies



Source: Studierenden-Sozialerhebung 2011.

2.1 Why is study transition selective?

Holzbecher/ Küllchen/ Löther (2002) as well as Lind (2007) identified several approaches explaining the under-representation of women in consecutive studies and Academia, where they differentiate

between individual explanations rooting on socialisation and structural explanations focusing on the system “University” resp. “Science”. In the early stages of research on this matter during the 1980s studies mostly focused on biographical and socialisation-based explanations (Lind 2007), whereas in the past decade explanations focusing on the university as an organisation gained a growing importance in explaining the underrepresentation of women in consecutive (PhD-)studies. Though findings on barriers on the individual level are still valid, more recent studies could show that structural obstacles have a greater impact on the differences between men’s and women’s educational careers. (Lind 2007)

Bourdieu and Passeron (1971) identified universities as a social space which’s entry processes are highly influenced by self as well as social selection. Over centuries it has been a space were men (of high social class) operate alone. Leemann (2002) argues that universities are therefore systems with a “distinctive gender substructure and an asymmetric gender culture”. The formed male academic Habitus hampers women’s chances for an academic career which - as already stated above - is a prerequisite for an occupational career in Academia (Leemann 2002).

Coming back to the interaction of horizontal and vertical segregation in higher education, we mentioned above that the intensity of the underrepresentation of women in consecutive studies varies significantly by field of study. Some of the overall differences can be seen as results of different proportions of women among different fields of studies. The overall share of students planning/ graduates enrolling in consecutive studies also differs a lot by field of studies, which is also due to disciplinary specific expectations on the usability of a PhD-degree on the labour market (Metz-Glöckel 2007). Women generally are overrepresented in faculties with lower transition rates, which partly causes mathematically explainable lower overall participation rates in consecutive studies (Emerek/ Østergaard Larsen 2011). When taking the fields of studies into account, the differences between men and women still persist and even amplify: Women enrolled in fields of studies with a balanced distribution of men and women or with a higher share of women are not more likely to continue their studies than men. Fields of study with high shares of women, however, seem to increase the motivation of men in relation to women to continue their education, as they see consecutive studies as an advantage for their occupational careers (Holzbecher/ Küllchen/ Löther 2002, Lind 2007).

Another approach to explain the different extends of gender gap along fields of studies is provided by Leemann (2002), who examines the effects of the “contact thesis” (Kanter 1977) and those of the (contradicting) “competition thesis” (Tolbert, Simons, Andrews & Rhee, 1995). The contact thesis assumes that prejudices against women start to disappear and integration chances of women start to increase when the share of women rises. This is the case for more female dominated disciplines, whereas fields of studies like engineering are more dominated by male scientists and make it more difficult for women to enter communication and interaction circles. The competition thesis, however, contradicts the assumption of a linear correlation between share of women and integration. A rising share of women increases the fear of competition among men and increases the prejudices towards women, making it more difficult for them to feel as part of the system. If women make up for a certain share of students (among 40%) the integration chances start to improve. In disciplines where women are considered “exotic” integration chances and therefore the chances of transition to a consecutive

program are also higher (Leemann 2002). The examination of the above mentioned findings does however not fully support these two approaches. A more detailed differentiation of disciplines and also a higher number of cases would be necessary to re-examine these two theses. The findings of Holzbecher/ Küllchen/ Löther (2002) as well as Lind (2007) also contradict these theses with their assessment that men in women dominated fields are more likely to continue their academic career than women.

2.1.1 Explanation-Hypothesis 1: Uncertainty and less specific goals

Looking at the timeframe after graduation students envisage for their transition to a consecutive study, another indicator for women striving for a consecutive study career less often than men can be found. Overall, 59% of male BA students and 51% of female BA students are planning to continue with a MA programme directly after graduation, while a fifth of male but a quarter of female BA students intend to enrol in a MA programme later after graduation.[1] Considering the transition between MA and PhD, the uncertainty gap between men and women appears to be even bigger: The share of males willing to continue with a PhD programme directly after graduation from MA is more than double the share among women (23% of males vs. 10% of females).[2] At the same time, women answered they did not know yet what to do after graduating from their MA 1.5 times as often as men. In natural sciences it is also males who intend to continue their studies in a PhD programme directly after graduating from a MA (36% of male MAs and 13% of female MAs).[3] Also, in social and economic sciences we see a significantly larger share of students who don't know yet whether they want to continue studying after graduating from their MA among women (44%) than among men (25%).[4] In technical studies, we even see males planning a direct transition from BA to MA as well as from MA to PhD significantly more often than females,[5] though those who intend to enrol in a MA programme some time later after their graduation do not differ significantly by gender. Referring to the gap we see between the share of women under the assumption of all transition plans being realised and the actual gender distribution among MA and PhD students (Figure 3), we have to conclude that student's plans of continuing their studies do not necessarily coincide with their real actions. We can therefore draw a first hypothesis from these evidences:

H1: Women seem to be less secure and less stringent in planning their study career than men.

These findings are supported by findings in literature: Uncertainty is also considered to be a cause of the underrepresentation of women in PhD-studies: According to Lind (2007) women express more difficulties in setting out one clear career goal and planning their careers in the process. These uncer-

1 X^2=12,82, α=0,05. Data: Studienpläne von Universitätsstudierenden 2013.
2 X^2=18,42, α=0,01. Data: Studienpläne von Universitätsstudierenden 2013.
3 X^2=5,36, α=0,05. Data: Studienpläne von Universitätsstudierenden 2013. No significant differences for BA students.
4 X^2=7,58, α=0,01. Data: Studienpläne von Universitätsstudierenden 2013.
5 BA students: X^2=6,18, α=0,05; MA students: X^2=3,51, α=0,1. Data: Studienpläne von Universitätsstudierenden 2013.

tain career plans of female students could be classified as individual barrier. However, one can still expect a link between uncertainty and structural processes and effects.

Lind (2007) identifies the differences in the "reassurance culture" towards female and male students as one structural barrier for women to continue their studies (which could also raise the level of uncertainty among women). Women (in certain fields of studies) report less often than men that they received acknowledgement of their competencies, which has a negative impact on their plans to enroll in PhD-studies.

Holzbecher/ Küllchen/ Löther (2002) as well as Leemann (2002) mention in this context also a "cooling out" phase, a phase of disintegration for women during their studies. Female students are less involved in the complex communication and interaction structures of the organisation "university" which leads to a feeling of "exclusion" or "not belonging" and increases the chances of either quit the higher education system after graduation even though they originally planned to enroll in a consecutive study or (in case of a successful transition to PhD-studies) dropping out. The differences in the "reassurance culture" towards men and women can vary along disciplinary sectors and can cause different participation rates of women and men by fields of studies (Holzbecher/ Küllchen/ Löther 2002).

An examination of the situation of students in their PhD-studies in Austria (Zaussinger et al. 2012) also shows that women are less satisfied with their integration in research taking place at their university and feel less supported during the preparation of publications, presentations and proposals than men.

2.1.2 Explanation-Hypothesis 2: horizontal instead of vertical

On the whole, most BA students in Austria intend to continue with a masters' degree (75% of women in BA and 78% of men in BA). Among female BA students planning to continue their studies, a share of 9% envisages to enrol in another Bachelor programme after graduation from their current one. Among male BA students with further study plans, only 6% state the same.[6] An even bigger difference can be observed among MA students, where more than one fifth of female students intend to enrol in a MA programme after graduation in comparison to 7% of male MA students.[7] Due to a very biased distribution of male and female students in different fields of study, it is difficult to gain significant results from a comparative analysis of future plans of MA students in all fields of study. Especially for Humanities which is dominated by female students, and male dominated technical studies, the size and variance of the comparative groups differ too much to allow for a valid Chi^2 statistic. Nevertheless, we can summarise a second explanatory hypothesis:

H2: Female students tend to broaden their knowledge rather than striving for a higher grade or scientific specification more often than male students.

These findings are also supported by various explanations found in past research papers: Abele (2003) states for female career aspirations that they are less specific and less „directed" in comparison

[6] X2=3,93, α=0,05. Data: Studienpläne von Universitätsstudierenden 2013.
[7] X2=5,71, α=0,05. Data: Studienpläne von Universitätsstudierenden 2013.

to male career paths. Moreover, the author suggests that women are more liberate in terms of social coercion concerning the expectations they are confronted with. Following that argumentation, women have a broader set of choices than men of how they want to "design" their career. Gärtner/ Himpele (2010) also stated that women tend to plan broader careers (enrollment in another Bachelor-/Master-programme) instead of a vertically higher qualification which can be seen in the context of a higher share of women who are enrolled in more than one field of study than men (ibid.). The combination of higher levels of uncertainty and less integration in one field of study or one career path as well as the thesis that women have less specific career goals than men, this could also (partially) explain their ambition to continue their education on a horizontal instead of a vertical level.

2.1.3 Explanation-Hypothesis 3: field specific conditions rather than individual occupational motivation

Earlier as well as more recent papers looked into men's and women's occupational motivation and didn't find any significant differences between these two groups regarding their overall occupational motivation. They did however find differences regarding the importance attached to "work contents and tasks" and "professional status": Women's motivation lies more on the content aspects of their (future) occupation and less on the status, whereas men tend to point out status-related ambitions (prestige, high income) regarding their future occupation and are also more likely to identify these ambitions as reasons for their plans to continue their studies (Lind 2007, Holzbecher/Küllchen/Löther 2002). Analysis of the available data however could not support this thesis.

Positive reinforcement and (informal) support from professors is also a very beneficial factor to motivate students to carry on with their study path. However, men receive more support and advice to fulfill this career than women, which Lind explains with the expectation that women more likely will have difficulties to with the work-life-balance than men. Supporting women can be seen as more risk-bearing for professors, which will result in a lack of confidence towards women's abilities/availabilities and which therefore causes women to feel less integrated in the system. This increases the drop out ratio of women and reinforces the expectations of professors (Lind 2007).

Following the argument of Lind (2007), it is more crucial for women than for men to receive sufficient support and to face adequate structural conditions for studying, in terms of study continuation. Among those who do not intend to enrol in a PhD programme after graduation from their MA, women state significantly more often than men that they did not have the confidence to strive for a PhD degree (27% of women vs. 10% of men).[8] Female MA students who do not intend to continue their studies consecutively also find the structure, organisation and design more often hindering for their studies than women who do want to enrol in a PhD after graduation (42% vs. 35%).[9] Also, women who do not intend to enrol in a MA after graduation from BA state a lack of personal assistance or support from teachers and general university staff as at least partially hindering for their studies more often than

[8] X^2=7,27, α=0,05. Data: Studienpläne von Universitätsstudierenden 2013.
[9] X^2=9,06, α=0,05. Data: Studienpläne von Universitätsstudierenden 2013.

women who do envisage a PhD (58% vs. .49%).[10] Although we cannot conduct a statistically valid analysis for all fields of studies due to a small number of cases, we can conclude a third hypothesis:

H3: Gender specific differences in pursuing a certain study career cannot entirely be traced back to personal motivations, but occur due to field specific circumstances and structural conditions.

2.2 Further (theoretical) explanations

Most studies (still) tend to link the leaky pipeline at the transition into PhD and also afterwards with perceived/ expected difficulties to balance work and family for women. The transition period from Master into PhD-studies is often seen as problematic for women, since it is considered to be at an age when women tend to start a family. For men, however, who are at about the same age and in the same transition period family plans and consequential child care is seen as less hindering to continuing their educational pathways at a higher level (Holzbecher/ Küllchen/ Löther 2002, Lind 2007). Lind even goes as far as stating that in some contexts difficulties with the work-family balances and underrepresentation of women in science is used as synonyms. This persistent explanatory approach, however, neglects factors regarding the university system itself (Lind 2007). Analysis of the available data also doesn't support these findings.

The low level of formalisation of the PhD-studies has also been identified as more hindering for women than for men. A comparison of countries with higher formalized access to such studies showed that formalisation of access has been beneficial for women's transition rates. Official tenders and transparency in general are important factors, which can help to raise women's participation rates in PhD-studies and further Academia. (Lind 2007, Metz-Glöckel 2007)

Indication for another barrier for women to enroll in consecutive studies can be seen in the fact that women receive less financial support during their doctoral studies than men (Pell 1996) and are more often financed by (social) scholarships. Students who are supported in this way are more likely to drop out.

[10] X^2=12,87, α=0,01. Data: Studienpläne von Universitätsstudierenden 2013.

3. Summary and outlook

As stated above, this paper attempts to go a first step beyond most of the studies and research work that is done in order to outline gender differences in occupational or educational careers. Focussing on graduates and employees, these works' perspective mostly views already the result of another process, which follows gender biased mechanisms itself. Especially for the academic labour market it is crucial to look at the education paths that lie before the first labour market transition or even before a post-graduate degree has been attained.

For Austria, data to analyse this matter is rare and allows only for rather vague approximations. Nevertheless, it can be shown that "The Pipeline" leaks already before most studies deploy their examinations. Already from undergraduate to graduate studies significant gender biased transition behaviour can be shown, where it becomes clear that this is not necessarily the path as it was planned to be treaded. Would all female students intending to continue their studies in a consecutive programme realise their plans, the gender distribution would not change much from what it looks like among BA students. As a comparison of gender distributions among BA, MA and PhD students clearly show, the share of women decreases remarkably on the way through graduation careers, regardless of different trends in different fields of study.

It is beyond controversy that this analysis can only scratch on the surface of what has to be unveiled. The data that has been used for the present paper has not been collected with the prevalent aim of analysing this specific matter, respectively has not the required depth or sample size to allow for a more complex, multivariate analysis. Because the available data did not allow for sufficient multivariate analysis of this specific question, third variables could not be controlled. Also, we could not account for a final transition rate, firstly, as we could not cover students that continue their studies abroad. Secondly, for the present paper only survey data was available, which does not disclose the actual share of all students that continued their studies. As an approximation, only student's plans of continuing studies could be accounted for. However, as already shown by Gärtner, Himpele (2010), Wejwar et al. 2013a and 2013b, the approximation is indeed justifiable.

The pressing question that arises thereof is: Where do these differences come from? With regards to results from a study conducted in 2013, aiming at explaining the differences in transition to consecutive study programmes (Wejwar et al. 2013a), an empirical attempt has been made to approach this question in order to explain the leaky pipeline from BA to PhD from a student's perspective. Additionally, similar studies focussing on slightly different educational or occupational stages have been considered to deploy a broader perspective.

Overall, we argue that reasons for the gender specific loss rates are multi-facetted. One explanation lies in women's individual preferences of broadening their knowledge rather than striving for a higher degree or more specific knowledge. Quite consistent with this assumption, data as well as theory suggests that women pursue their career in a less stringent or strict way, due to either more uncertainty regarding their plans, but also to broader possibilities considering gendered peer expectations and

societal coercion. In line with this argument, another factor refers to structural circumstances such as organisation of studies, scientific guidance and overall support that appears to be unequally granted to male and female students – surely also related to field specific “cultural” differences.

We are well aware that these explanatory attempts are far not exhaustive or sufficient, but nevertheless as comprehensive as possible regarding the data available. We do however claim for future research and targeted data collection in order to conduct more in-depth analysis to clarify not only the reasons why women continue their studies in consecutive programmes less often, but also, how these differences and potential inequalities can be overcome. At least, one goal for future research must be to unveil the complex mechanisms in order to enable possibilities and options as broad as possible to create equal opportunities for all students to pursue their individual educational and occupational paths without facing structural barriers and having to yield to force of inequality.

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