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1. Introduction

The concept of motivation is used in many different disciplines to analyze the ‘what and why’ (Deci & Ryan, 2000) of human action. A vast body of literature exists on the relationship of motivation and performance in professional work and organization settings (e.g. Osterloh, Frey & Homberger, 2011; Gagné & Deci, 2005). Motivation is widely acknowledged to enhance performance and efficiency of staff (Ryan & Deci, 2000). Beyond work settings motivation may influence performance in academic settings and among university students. Our main research question asks for factors that influence academic motivation: *Can student characteristics and study conditions impact academic motivation?*

In the following, at first a theoretical view on academic motivation will narrow down the subject of interest and distinguish it from already existing research. Secondly, factors that we assume of having an influence on academic motivation will be presented. We focus on students with non-traditional characteristics, the individual field of studies, different stages of studies, social background, and the organizational perspective of studying. Moreover, we look at the relationship between extrinsic and intrinsic motivation. Finally, our hypotheses will be tested empirically with data from a survey on academic motivation and on the students’ expectations. The survey was conducted at three German universities in 2009.

2. What is Academic Motivation?

We focus on the works of Vallerand, Pelletier and Koester (2008) or Vallerand, Pelletier, Blais, Briere, Senecal and Vallieres (1992) who developed the Academic Motivation Scale (AMS) by drawing on the self-determination theory (SDT) proposed by Deci and Ryan (1985). Motivation “is operationalized as the underlying “why” of behavior” (Vallerand, Pelletier, Blais, Briere, Senecal & Vallieres, 1992, p. 1008). Academic motivation asks the question “Why do you go to college?” (Vallerand, Pelletier, Blais, Briere, Senecal & Vallieres, 1992, p. 1008). Thus, academic motivation can be understood as the motivation to decide for and continue with university studies.

Deci and Ryan basically identify “several distinct types of motivation” (Ryan & Deci, 2000, p. 69). These types of motivation root in the perceived locus of causality, which can be internal, external or impersonal (see figure 1):

“[M]otivation for the behavior can range from amotivation or unwillingness, to passive compliance, to active personal commitment. According to SDT, these different motivations reflect differing degrees to which the value and regulation of the requested behavior have been internalized and integrated. Internalization refers to people's "taking in" a

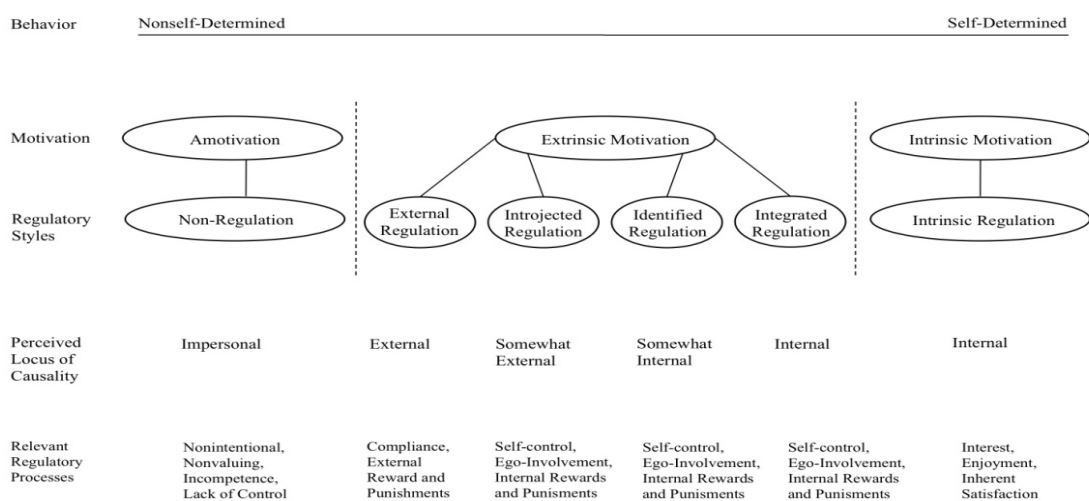
value or regulation, and integration refers to the further transformation of that regulation into their own so that, subsequently, it will emanate from their sense of self.” (Ryan & Deci, 2000, p. 71).

Deci and Ryan (2000) apply a very narrow definition of intrinsic motivation. A person is intrinsically motivated if an activity is done for itself and for the pleasure that derives from doing the activity. The development of intrinsic motivation is dependent on the degree in which the innate psychological needs of autonomy, relatedness, and competence are supported by the social environment. In turn, if behavior is not restricted by external forces, people can experience their actions as self-determined. Intrinsic motivation “refers to doing an activity for the inherent satisfaction of the activity itself” (Ryan & Deci, 2000, p. 71). Keywords that describe intrinsic motivation are interest, enjoyment, and inherent satisfaction. Individuals engage freely in activities where they experience these phenomena.

In contrast extrinsic motivation is related to behavior that is not done for its own sake but for external reasons. These external reasons can be rewards or punishments: “People behave to attain a desired consequence such as tangible rewards or to avoid a threatened punishment.” (Deci & Ryan, 2000, p. 236). The more external regulation is internalized the more actions are experienced as autonomous, i.e. self determined.

Ryan and Deci (2000) developed a continuum of self-determination with amotivation at one end, different types of extrinsic motivation in the middle, and intrinsic motivation at the other end (figure 1).

Figure 1: SDT (Ryan & Deci, 2000, p. 72)



Amotivation describes the situation where the actor perceives his or her behavior as being determined by external forces completely out of his or her own control (Cokley 2000, p. 561).

The SDT serves Vallerand and his colleagues (1992, 2008) as the theoretical underpinning to investigate students' academic motivation. They developed the Academic Motivation Scale (AMS) to measure students' motivation, which was again further validated by Cokley (2000).

Academic motivation is close to the term 'motivation to learn'. Following Krapp (1993, p. 188) motivation to learn deals with psychological processes which explain the appearance and evolvement of learning activities and its effects. Classical research fields are classroom settings and instruction. Obviously it is also part of academic learning. Learning as well as achieving play certainly a role for motivation to study; learning processes are naturally a part of university education and of academic motivation. A whole body of literature from school and educational psychology exists on learning motivation with emphasis on learning and instruction. Many studies deal with students' motivation regarding their learning aspirations and their psychological processes of learning (e.g. Murton et al. 2008, Paulsen & Feldman, 2005; Valle et al. 2003, Salili et al. 2001, Bures et al. 2000). Nevertheless, learning motivation is not to be confused with academic motivation for the latter focuses exclusively on reasons why individuals decide for and continue with university studies.

3. Impact Factors on Academic Motivation

In the following we will discuss factors that may influence academic motivation.

Non-Traditional Students

The student body at European universities today is very diverse (Osborne 2003). Due to various socio-economic reasons such as labor market demands and the massification of higher education systems (Teichler 1998; Enders, Kehm & Schimank, 2002), the profile of the typical university student has become more heterogeneous over the last decades (European Commission 2009). Today students can more and more be characterized as non-traditional. This diverse group of students with non-traditional characteristics (NTS) is assumed to play an increasing role as an additional stakeholder that has been neglected politically as well as in empirical research (Schuetze & Slowey, 2002).

NTS are academic learners who were traditionally widely excluded from higher education for various reasons, especially in Germany. The traditional university student of the past was financed by parents, studied full time, and started university directly after a high school diploma had been acquired. Due to vast changes in higher education from elite to a mass system this is

not an adequate pattern of the contemporary academic reality anymore (OECD 2010). Nevertheless, participation of NTS has been quantified in different ways. Schuetze and Slowey (2000) explored the phenomenon of NTS with their international study on lifelong learners in ten countries. Other contributions have been addressing the topic of conditions of student life in the context of the Bologna reforms (European Commission 2009).

Following Schuetze and Slowey's (2002) as well as Wolter's (2000) definition of NTS we describe this group by three criteria:

1. The educational biography of NTS is characterized by a winding path to higher education and NTS often enter higher education at a later stage in their life cycle. There may be differences in student motivation between students of earlier or later life cycle stages. Therefore, we define NTS as students older than 30 years.
2. NTS access university often through alternative entry possibilities, which can be on the basis of work experience or through entry examination tests. In Germany the 'regular' way to enter university is the A-level. We define NTS as students without an A-level or as students with a second-chance education background.
3. The mode of studying among NTS differentiates often due to other major commitments. These are in particular work, domestic, and social obligations which do not allow for a full time study mode. Academic motivation may be influenced by a time-consuming wage employment. Therefore, we define NTS as students working more than 20 hours a week during semester.

Students who go to university at a later life cycle stage have more life experience, work experience, and perhaps more self-reflection on the reasons why to study. From the perspective of human capital theory NTS have less time in their life to yield profit from their educational investment because they are older than other students already. Therefore, we assume that extrinsic motivation like financial payoffs don't play a prominent role regarding their reasons to study. Additionally, if a student has to work more than 20 hours a week for his or her livelihood during semester, there has to be strong intrinsic motivation to continue with the studies. Our first hypothesis is:

H1: Students with at least one NTS criterion (either work more than 20 hours a week during semester or second-chance education or no A-level or older than 30 years) are more intrinsically motivated than students without these characteristics.

Field of study

The second factor assumed to have an influence on academic motivation is the field of study. Certain occupational fields imply higher future salaries to students than others. Alumni of busi-

ness administration or engineering earn much more in the average than graduates from social sciences (Graduate Employment Survey 2011). Financial rewards are perceived to enlarge extrinsic motivation (Frey & Osterloh, 2002); the same can be supposed for income prospects. This leads to the assumption that students from different study fields show different academic motivation.

H2: The higher the expected salary associated with a certain discipline the more students in this field of study are extrinsically motivated.

Study duration

Thirdly we take the stage of studies into consideration when investigating academic motivation. Undergraduate students study because all other peers study as well or because the parents expect it. Especially students in the first two semesters study because their environment expects that. That implies that undergraduate students perceive the locus of control for their behavior outside themselves and thus are more extrinsically motivated. Older students are less dependent from their family and peers in their behavior and therefore more likely to be interested in the field of studies itself and therefore more intrinsically motivated. We assume:

H3: The longer students are at the university the more intrinsically motivated they are.

Social background

Another factor influencing academic motivation is the social background of students; particularly the educational background of the parents is here important. Drawing on Boudon's (1974) distinction between primary and secondary effects of social origin a lot of German studies confirm that these effects are responsible for the underrepresentation of working class children at German universities (Becker 2009; Schindler & Reimer, 2010; Schindler & Lörz, 2011). The majority of these studies emphasize that primary effects play only a minor role for explaining discrimination of lower class children, whereas secondary effects can better explain social inequalities. These secondary effects can not only explain general decisions for or against a university study but also the transition from Bachelor to Master programs (Ausprung & Hinz, 2011). Schindler explains the differences between both effects as follows:

“Since students from lower status families can rely on less cultural resources than their classmates from higher status families, their school achievement will on average be lower than that of their peers. At the same time, even if we were to compare students with the same achievement levels, we could observe additional (secondary) social background effects in that students from higher status families would aspire to higher levels of education more often than their lower status counterparts. Social differences in educational aspirations are seen as the out-come of cost-benefit considerations, while both the costs and benefits attached to continuing education differ between social backgrounds.” (Schindler 2010, p. 2).

In alignment with these findings we assume, that the social background influences academic motivation. In families where at least one parent acquired a university qualification, children grow up in an atmosphere that promotes academic thinking and academic behavior in general.

We predict that students from a higher-class background are more focused on scientific topics because for these families academic thinking is a value in itself (Boudon 1974; Becker 2009). This attitude in the family home to value academic thinking as such has the potential to promote intrinsic academic motivation. Our next hypothesis is:

H4: Students with an academic family background are more intrinsically motivated than students without an academic family background.

Students' environment: Organizational and structural side of studying

We lean on the Job Characteristics Model (JCM) from Hackman and Oldham (1980) to shed light on organizational requirements for motivation. The approach shows how job characteristics influence work satisfaction and motivation which are in turn believed to influence job performance positively. The model contains five core job dimensions that encourage motivation and job satisfaction: skill variety, task identity, task significance, autonomy, and job feedback. Intrinsic motivation is believed to occur when three critical psychological states are present in the individual. The JCM found support for the proposed relationships between job characteristics and psychological states as well as motivational outcomes in various studies (Fried & Ferris, 1987). The core job dimensions generate the psychological states as follows:

- A job perceived as providing skill variety, task identity, and task significance leads to the experience of meaningfulness.
- Perceived autonomy generates individual responsibility for work outcomes.
- Feedback creates knowledge of the results.

We assume that organizational characteristics of studying at a university can influence motivation in academic settings – analogue to the findings related to the occupational setting. We predict that autonomy (second bullet point) is transferable to academic settings and appropriate to analyse students' reaction to study conditions. A high level of intrinsic motivation is dependent on structured conditions which allow feelings of autonomy and flexibility. Autonomy is defined by Hackman and Oldham as follows: "The degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out" (Hackman & Oldham, 1980, p.79). When a task provides considerable autonomy, the performing person will perceive the work outcomes as depending largely on his or her own effort, initiative, and decision. The outcomes are not at-

tributed to external institutions like instructions from a supervisor or a personal set of regulations.

Transferred to academic settings autonomy is perceived when the organization of studies provides students freedom of decision-making. If students have enough room for alternative activities and thus perceive autonomy in their acting, intrinsic motivation can arise. Students with a high level of autonomy perceive freedom in scheduling their studies according to their own requirements and feel independent in determining study procedures. This can also include aspects like deciding freely on exam modes and exam timings and not being limited to few inflexible set exam dates. Autonomy and decision freedom in university contexts can also mean having the possibility to attend classes at unusual times (e.g. at evenings or weekends) or to integrate practical orientation and projects into their studies. Students who have the possibility to work more independently from class schedules can better attribute study outcomes to their own effort than students who have to follow a strict curriculum. In contrast, fixed regulations and unalterable procedures hinder the development of autonomy.

Active participation in the studies has also the potential to generate the feeling of autonomy. If the faculties provide students with the opportunity to participate directly in the development of classes and their content, the feeling of autonomy is more likely to be generated and intrinsic motivation can evolve.

Hackman and Oldham (1980) also acknowledge moderating influences in their JCM such as the organizational context. Access to information about studying is often determined by the organizational structure. The easier it is to find information about organizational aspects of the studies (but also about the content), the more certainty students perceive that what they do is right. In this way the academic situation is comparable to the phenomenon of job security analyzed by Hackmann and Oldham. The less time wasted on worrying about aspects like ‘Did I choose the right course?’ the more time students actually have to study. This gives way for the generation of intrinsic motivation. Summarizing these considerations we formulate:

H5: The less the organizational structure creates friction (e.g. information gathering or needing flexibility or desire to participate), the more students are intrinsically motivated.

Crowding out effect

The next factor deals with the relationship of intrinsic and extrinsic motivation and how the two interact. Extrinsic and intrinsic motivation is not necessarily additively connected. Moreover, the opposite has been widely discussed in literature (Frey & Osterloh, 2002). If a person is intrinsically motivated an additional extrinsic incentive has the power to reduce the existing level of intrinsic motivation. Frey (1994) introduced the term crowding-out effect that describes the

trade-off between the two motivation types. According to Frey and Osterloh (2002) intrinsic motivation is undermined when external incentives emerge that are perceived as external control of the own behavior. E.g. a person, initially used to do a certain job enthusiastically because of the task itself and therefore intrinsically motivated, loses some of that interest when promised a financial reward. The external intervention is perceived as an external control mechanism that lowers self-determination and corrupts intrinsic motivation. Eventually the person will be unwilling to do the job without being rewarded.

Transferred to our subject it means that the above explained motivation types of extrinsic and intrinsic academic motivation may not found to be coexistent in an individual. If certain study characteristics are perceived as external control mechanisms they may diminish intrinsic motivation. In alignment with Frey and Osterloh (2002) we assume the following:

H6: Extrinsic and intrinsic academic motivation is negatively correlated (crowding out effect).

Expectations

Motivation may be also influenced by the students' general expectations towards studying. If the personal goal of studies is primarily vocationally oriented in the sense that the student expects practical knowledge, skills development and a good preparation for the future job, this student is extrinsically motivated. He or she acts because the action goal is in the center of interest. Students of such kind aim to apply acquired knowledge directly to their jobs (e.g. Murtonen, Olkinuora, Tynjälä & Lehtinen, 2008).

Intrinsic motivation is defined in the opposite: means and end of action thematically match (Heckhausen 1991, p. 406). That means, if students are scientifically oriented and study because dealing with the topic itself and scientific thinking in general is of interest, these students are intrinsically motivated. Acting and the action goal are thematically corresponding. First of all these students are interested in learning and not in qualifications (although in a certain sense scientific thinking and acting is also vocational training in the job of a scientist).

We understand a person with expectations towards vocational training as extrinsically motivated because the academic qualification serves mainly as a means to enter the labor market. In contrast, expectations about dealing with scientific contents lead to intrinsic motivation.

We summarize our suggestions in following hypotheses:

H7a: The more students are scientifically oriented, the more they are intrinsically motivated.

H7b: The more students are vocationally oriented, the more they are extrinsically motivated.

In the following we draw on results from a quantitative study on German students' motivation that will help to test the above-formulated hypotheses.

4. Empirical Evidence: Results from a Survey in Germany

4.1. Sample Size

Our survey on students' expectations was conducted at three German universities in winter term 2009/2010. Our sample contains 3687 students (TU Dortmund University 1397, University Duisburg-Essen 1300, and University Oldenburg 990). In order to differentiate between different study cultures in different scientific disciplines, students from three different departments were assessed: social sciences ($n = 1110$), economics ($n = 1299$), and engineering ($n = 1278$). All items regarding attitudes are measured on five-point Likert scales (1 = strongly disagree, 5 = strongly agree).

4.2. The Dependent Variable: Academic Motivation

To measure students' motivation we use the Academic Motivation Scale (AMS) from Vallerand et al. (1992, 2008). The AMS contains 28 items originally. In our study the AMS was reduced to 21 items. The reduction was necessary because of the extensive amount of items of the whole questionnaire.

In a second step the selected AMS items were translated from English to German by the researchers. Due to cultural differences between the Anglo-American and the German understanding of university education and differences in the university system, minor modifications were made to adjust the wording of the items to the German approach and understanding. Finally, to assess the adequacy and the clear understanding of the German version of items and instructions a pre-test was conducted with 15 undergraduate university students from social sciences. Again some minor adjustments were made.

Due to the changes we had made (5 point Likert scale instead of a 7 point one and 3 items per assumed factor instead of 4) and the differences in the academic culture between Germany and the Anglo-American model, we used a principal component analysis instead of a confirmatory factor analysis to find the optimal factor structure. We found only four instead of the original seven factors. We deleted two items because they belong to more than one latent variable. These items are: 'For the pleasure I experience while surpassing myself in my studies' and 'Because my social environment expects it'. The factors are defined by an eigenvalue greater than one according to the Kaiser-criterion. An orthogonal rotation following the varimax method with Kaiser-normalization makes it easier to interpret the factors (table 1). With a KMO-value of .88 and an explained variance of 56.5% the factors 'intrinsic motivation' (Cronbachs Alpha = .847), 'identified motivation' (Cronbachs Alpha = .771), 'extrinsic motivation' (Cronbachs Alpha = .745), and 'amotivation' (Cronbachs Alpha = .798) can be distinguished. In comparison to the original AMS intrinsic and extrinsic motivations are somewhat 'broader', while introjected moti-

vation and amotivation draw on the same items Vallerand et al. (1992) used. In our case the intrinsic subscales could not be differentiated, they together build our intrinsic motivation scale. The same can be said for extrinsic motivation, it consists of the external and identified subscales. In this article we will focus on the intrinsic and extrinsic motivation scales.

Table 1: Principal component analysis: academic motivation

	Factor loading			
	Intr	intro	Extr	amot
Intrinsic Motivation $\alpha = ,847$				
Because I experience pleasure and satisfaction while learning new things.	,694			
For the intense feelings I experience when I am communicating my own ideas to others.	,674			
For the pleasure I experience when I discover new things never seen before	,750			
For the pleasure that I experience when I feel completely absorbed by what certain authors have written.	,722			
For the satisfaction I feel when I am in the process of accomplishing difficult academic activities.	,648			
Because my studies allow me to continue to learn about many things that interest me.	,639			
For the "high" feeling that I experience while reading about various interesting subjects	,733			
Because college (CEGEP) allows me to experience a personal satisfaction in my quest for excellence in my studies.	,477			
Introjected Motivation $\alpha = ,771$				
To prove to myself that I am capable of completing my college (CEGEP) degree		,787		
Because of the fact that when I succeed in college (CEGEP) I feel important.		,726		
To show myself that I am an intelligent person		,783		
Extrinsic Motivation $\alpha = ,745$				
Because I think that a college (CEGEP) education will help me better prepare for the career I have chosen.			,684	
In order to obtain a more prestigious job later on			,574	
Because eventually it will enable me to enter the job market in a field that I like.			,652	
In order to have a better salary later on.			,690	
Because this will help me make a better choice regarding my career orientation			,735	
Amotivation $\alpha = ,798$				
Honestly, I don't know; I really feel that I am wasting my time in school.				,812
I once had good reasons for going to college (CEGEP); however, now I wonder whether I should continue.				,808
I can't see why I go to college (CEGEP) and frankly, I couldn't care less.				,783

Abbreviations: intr = intrinsic motivation; intro = introjected motivation; extr = extrinsic motivation; amot = amotivation

4.3. The Independent Variables

Non-traditional students

To measure our first hypothesis the following three items were developed in order to operationalize non-traditional students' characteristics:

- Being older than 30 years (n = 101);
- University entry path: No A-level; using other entrance possibilities by second-chance education (n = 355);
- Work more than 20 hours a week in a job additionally to university studies (n = 88).

Field of study

For our second hypothesis on the fields of study, we examined students from three different scientific disciplines: economics (n = 1299), engineering (n = 1278), and social sciences (n = 1299). The latter one was used as a reference category. We assume that graduates in business administration and engineering earn significantly more money than graduates in social science. To support the second hypothesis the students in business administration and engineering should be more extrinsically and less intrinsically motivated than students in social sciences.

Study duration

We differentiate between graduate students (eighth semester or above; n = 636) and undergraduate students at the beginning of their studies (first or second semester; n = 1062).

Social background

The fourth hypothesis is measured by items that ask for the educational background of the parents. Therefore we differentiate students who have at least one parent with a university degree (n = 1284) from those who have not.

Organization

To test our fifth hypothesis on organizational aspects of studying, we developed eleven items to operationalize the perception of information, flexibility, and participation.

First, flexibility refers mostly to temporal aspects of studying. Our items measured if students can substitute the personal attendance of classes through private studies, if programs are flexible regarding exam periods, deadlines, and times of application, if students can visit classes at unusual times like in the evenings or at weekends, if students have considerable *latitude* to work parallel to their university study, if the classes are not overcrowded, and if practical phases are integrated in the curriculum. These items build a scale with Cronbachs Alpha = .602.

The second organizational aspect addresses access to information. Three items measure this aspect that ask for study coordinators, the availability of the teachers, and regular information on studying (Cronbachs Alpha = .651).

Thirdly, the organizational structure was analyzed regarding the aspect of participation. To measure this aspect we asked for the degree of active involvement in development and arrangement of study contents.

Crowding out

To test our sixth hypothesis we integrated extrinsic motivation as an independent variable in the intrinsic motivation model and vice versa: intrinsic motivation as an independent variable in the extrinsic motivation model.

Expectations

For the last hypothesis we created an index for vocational orientation with the following items: 'The content of the studies should be in step with actual working practice', 'Studies should simulate real working life problems', and 'Studies should prepare me for my job' (Cronbachs Alpha = .735). Scientific orientation consists of following items: 'Studies should teach me the latest scientific results', 'Studies should introduce me to scientific research' (Cronbachs Alpha = .600).

Control variables

Apart from these hypotheses-driven variables, we test for gender specific influences on academic motivation. We also checked for the relevance of a migration background ($n = 971$) which we define as a person who was not born in Germany or with at least one parent who was not born in Germany.

4.4. Empirical Results

To test our hypotheses we used OLS-regression analyzes. We estimated two models which explain the variance of intrinsic and extrinsic motivation (table 2). The reason why we limited our analyzes to these two dependent variables is, that we focus on intrinsic and extrinsic motivation as the most mentioned and quoted concepts in literature (see H 6).

Table 2: Influence of different factors on intrinsic and extrinsic academic motivation

		Intrinsic motivation	Extrinsic motivation
Non-traditional Students	working more than 20 hours a week	-.019	.008
	second-chance education or no a-level at all	.013	-.014
	older than 30 years	.027	-.068**
Field of study	economics	-.059**	.221**
	engineering	-.047*	.157**
	social sciences (reference category)		
Study duration	first or second semester	.024	.016
	eight or more semesters	-.025	-.006
Social background	at least one parent with a university degree	.008	-.008
Organization	flexibility	.047**	.019
	information	.049**	-.013
	participation	.106**	-.063**
Crowding out	extrinsic motivation	.179**	
	intrinsic motivation		.208**
Expectations	scientific orientation	.468**	.032
	vocational orientation	-.077**	.265**
Control variables	gender (1=female)	.005	-.034*
	migration background	-.008	.067**
	n	3280	3280
	adj. r ²	.302	.190
	** p < .01 * p < .05		

There is little evidence for our first hypothesis. All three factors of the NTS definition have no influence on intrinsic or extrinsic motivation with one exception: Students who are older than 30 years are less extrinsically motivated than younger students. The second hypothesis is confirmed. Students from economics and engineering are in comparison to social science students less intrinsically and more extrinsically motivated. The field of study matters. We have to reject the third hypothesis because the number of semesters spent at university has no influence on academic motivation. Surprisingly also the social background does not matter. Motivation seems to be independent from the parents' educational status. Our fifth hypothesis is supported to some extent. On the one side, flexibility, information, and participation have positive impacts on intrinsic academic motivation. On the other side, participation has a negative effect on extrinsic academic motivation. Regarding the sixth hypothesis we observe that there is no crowding-out effect at all. Both types of motivation have a strong positive influence on each other. Our last hypothesis is supported because scientific orientation has a very huge positive impact on intrinsic motivation. Vocational training orientation has a negative effect on intrinsic motivation but a strong positive impact on extrinsic academic motivation.

Regarding our control variable it is interesting to observe that female students are less extrinsically motivated than male students. This finding is in alignment with Vallerand, Pelletier, Blais, Briere, Senecal and Vallieres (1992; Cokley 2000) who found that female students are more likely to show intrinsic academic motivation than male students. Migrants have a somewhat higher extrinsic motivation.

5. Conclusions

Our findings show that the construct 'academic motivation' has intrinsic and extrinsic aspects which do not stand in conflict with each other. Even if students are intrinsically motivated, an additional selective incentive does not destroy the intrinsic motivation. On the contrary, these intrinsic and extrinsic aspects of academic motivation – as the reason to decide for and continue with a university study – amplify each other. On one side there is no crowding out effect at this level. On the other side there are still some influencing factors (field of study and vocational orientation) which have an antithetical effect on extrinsic and intrinsic motivation.

Our findings show that expectations have a heavy impact on these different aspects of academic motivation. This is also a mechanism that affects extrinsic and intrinsic motivation differently. A student who expects to be trained for a job or who earns well is extrinsically motivated. Students who go to university for the love of science or who do not expect great financial rewards from their studies are intrinsically motivated. This may not be very surprising but we think behind these obvious findings some wisdom can be found: Expectations are related to knowledge about university in general. This leads us to the conclusion that the more students know about studying - not the contents of certain disciplines but the more general information on what, why, and how - the more they are motivated in general.

Another result is that neither the NTS-characteristics nor the social background influence motivation on a significant level. The influences seem to stem mostly from personal expectations and from the subjective perception of the organizational structure of studying.

We summarize our empirical evidence with the advice to inspire students and give them leeway for action. This is much more important than a detailed schedule of the program. Teaching students to love scientific thinking will enhance their academic motivation.

These findings are restricted to the German case and we can say that the situation in Canada and the USA and probably anywhere else is different. Further work has to be done to explain what exactly causes these differences. In addition we still need to bring the other aspects of motivation (amotivation and introjected motivation) into the picture to get a broader understanding on how and why academic motivation varies.

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