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Berlin Social Science Center

Irena Pietrzyk
Jutta Allmendinger
Melinda Erdmann
Marcel Helbig
Marita Jacob
Stefan Stuth

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Affiliation of the authors

Jutta Allmendinger, Melinda Erdmann, Marcel Helbig, Irena Pietrzyk
Berlin Social Science Center

Marita Jacob, Stefan Stuth
University of Cologne

Future and Career Plans Before High School Graduation (ZuBAb): Background, Research Questions and Research Design

by Irena Pietrzyk, Jutta Allmendinger, Melinda Erdmann, Marcel Helbig, Marita Jacob, Stefan Stuth[*]

Summary: The German educational system is characterized by pronounced educational disparities based on the parental socioeconomic status. Despite the rather strong stratification of the secondary school system and social selection into obtaining the university entrance qualification, the transition to higher education is no exception to the general picture of strong inequalities in the German educational system. Social differences in enrolment in higher education might be partly due to the unequal distribution of information and differences in social support. If this were the case, offering information and support via guidance counsellors could reduce educational disparities in the transition to higher education. However, empirical research on this issue in Europe, especially in Germany, is scarce. Against this background, the study *"Future and Career Plans Before High School Graduation"* (in German: Zukunfts- und Berufspläne vor dem Abitur, ZuBAb) investigates how a broad long-term counselling program affects the educational pathways of university-eligible students by means of a randomized controlled trial (RCT). The study focuses on the reduction of inequalities in university enrolment (primary outcome). Furthermore, we examine the effect of the intervention on the development of socio-emotional competencies, choice of study majors, satisfaction with educational choices, congruence between occupational interests and educational choice, and rational choice components (secondary outcomes). In addition to investigating the effect of the program on educational pathways by means of an RCT, we analyse the social composition of participating students under real world conditions to estimate the effectiveness of the program in reducing educational disparities under real world conditions. The present discussion paper provides an overview of the background of the ZuBAb study, the research questions that are addressed, and the research design. The study is currently being conducted. It is funded by the Ministry of Culture and Science of the German State of North Rhine-Westphalia. Research is jointly carried out by the Berlin Social Science Centre and the University of Cologne.

Keywords: educational inequality, educational intervention, randomized controlled trial (RCT)

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WZB Berlin Social Science Center
Reichpietschufer 50
10785 Berlin
Germany
www.wzb.eu

Content

1. Background

1.1 Introduction

The German educational system is characterized by pronounced educational inequalities (e.g., Müller/Karle, 1993; Breen/Luijkx/Müller/Pollak, 2012). On all educational levels, the parental socioeconomic status is crucial for students' educational success (e.g., Becker, 2003; Becker/Hecken, 2008; Jaksztat, 2014; Neugebauer/Neumeyer/Alesi, 2016; Pietsch/Stubbe, 2007; Reimer/Pollak, 2010). Because the educational choices and the accordingly acquired educational certificates are decisive for the allocation on the labour market (e.g., OECD, 2018), these educational inequalities translate into disparities in life chances. From a normative perspective, such inequalities based on social origin are not in line with the idea of equal educational opportunities under different starting conditions (e.g., Dahrendorf, 1965). In addition, economic considerations indicate a shortage of skilled labour in Germany (e.g., DIHK, 2018) and thereby necessitate increased participation of socially disadvantaged youth in the high-order tracks of the strongly stratified educational system. Despite the constantly growing overall number of students enrolling in university[1], social inequalities in the transition to higher education remain strong (e.g., Hillmert/Jacob, 2003; Lörz, 2012; Reimer/Pollak, 2010; Schindler/Reimer, 2010). For instance, for students whose parents belong to the highest social class (so-called *Dienstklasse*), the probability of enrolling at university is approximately 20 percentage points lower than for persons with working-class parents (Schindler/Reimer, 2010). Approximately 80 percent of these social differences can be traced back to factors independent of academic achievement (ibid.). It is of both scientific and sociopolitical interest to investigate the reasons for these strong disparities in university enrolment and to scrutinize options for their reduction.

Against this background, the study *"Future and Career Plans Before High School Graduation"* (in German: *Zukunfts- und Berufspläne vor dem Abitur, ZuBAb*) evaluates the impact of an extensive guidance counselling program that aims to support and increase university enrolment among socially disadvantaged students. The ZuBAb study addresses the impact of this particular intervention on post-school pathways, especially on the transition to university, by means of a randomized controlled trial (RCT). Furthermore, the effectiveness of the program in terms of reaching the target population under real world conditions is investigated.

The study seeks to considerably extend the state of research on the possibilities to reduce disparities in the educational careers of university-eligible high school graduates in Germany. Although scientific work on this topic has intensified remarkably in recent years, little is known presently about the efficacy of broad and long-term educational interventions in the European

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[1] Throughout the discussion paper, the term 'university' is used to indicate a higher education institution of any kind. Thereby included are all higher education institutions, i.e. inter alia universities of applied sciences (Fachhochschulen), art academies (Kunsthochschulen), and colleges of administration (Verwaltungsfachhochschulen).

context. This study investigates the impact of such an intensive program. The evaluated intervention is (i) an individual program. The guidance counsellors offer one-to-one counselling sessions for students who belong to the target group as opposed to general class room interventions. The counsellors can be understood as individual and low threshold contact persons for all questions concerning post-school education. The program is (ii) a long-term intervention, because the counsellors and the participants meet several times during upper secondary school. The offer is (iii) broad, as it not only provides information regarding educational opportunities, but also targets different aspects of social-emotional development, such as self-efficacy beliefs, problem-solving competencies, and self-regulatory processes. Recent studies investigating the effects of short-term information workshops on the university enrolment of socially disadvantaged high school graduates in Germany yielded mixed results, with some showing no effect on university enrolment (Daniel/Watermann/Maaz, 2017), and others showing an increase in university enrolment for a specific subgroup of socially disadvantaged students (Ehlert/Finger/Rusconi/Solga, 2017). In contrast, we expect that the long-term and broad educational intervention under investigation in the ZuBAb study should affect post-school pathways more strongly.

The present discussion paper describes the background of the ZuBAb study, namely the previous research on the impact of interventions on educational decision-making and educational disparities; it also presents theoretical considerations on why guidance counselling could reduce social disparities amongst university-eligible students in the transition to university. Furthermore, the research questions addressed in the study are presented, and the research design is described in detail. The study is currently being conducted.

The ZuBAb study was approved by the WZB Research Ethics Committee on 06 November 2017. The study is registered on AEA RCT Registry[2].

1.2 Previous Research

Looking closely at previous international research that addresses the impact of educational interventions on educational decision-making and educational disparities, different types of interventions can be distinguished, namely those that deliver information, those that provide financial support and other forms of practical support, and those that offer broad guidance counselling, among others. Some scholarly work explicitly focuses on the effects of these interventions for socially disadvantaged students, and is particularly concerned with reducing educational inequality, while other studies address the general impact on educational decision-making, regardless of social origin.

Two studies conducted in Germany address the impact of interventions on educational disparities in the transition to university. Both studies investigate the effect of delivering information.

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[2] https://www.socialscienceregistry.org/trials/2738

The first study analyses the effect of an information workshop delivered by volunteer mentors in the upper secondary school on different rational-choice components believed to be influential for university enrolment (i.e. estimates of the costs and benefits of college and the subjective success probability of college completion) and on the intention to enrol at university (Daniel et al., 2017). Although participating in the intervention led to students feeling better informed about post-school careers, it did not have a long-term effect on rational-choice components or on the intention to enrol at university. The second study, carried out within the project "*Berliner Studienberechtigten Panel*" (Best Up), showed that an information workshop provided by the researchers to high school students increased the actual university application rates of those students without university-educated parents who initially intended to enrol at university (Ehlert et al., 2017). Trivariate analyses (treatment condition; application behaviour; knowledge about financing opportunities and benefits of university completion) indicated that this effect might be based on the content of the information workshop, which addresses the costs and benefits of university. However, no overall effect of the workshop on college enrolment was observed for the whole group of socially disadvantaged students. Likewise, in the context of the Best Up study, the researchers analysed whether a monthly scholarship of 300 Euro offered during the first university year leads to a higher university application rate among socially disadvantaged students. This financial intervention did not show the expected positive effect on university application behavior (Peter/Rusconi/Solga/Spieß, 2017). In summary, research in the German context indicates that the delivery of information can increase the university enrolment rate for a subgroup of socially disadvantaged students, but has no overall effect on higher education entry for all socially disadvantaged students. Until now, no studies have been conducted in Germany that investigate the effect of broad guidance counselling programs.

In international research, the effects of information workshops on the benefits and the costs of university have also been investigated, yielding mixed results (e.g., Barone/ Schizzerotto/ Abbiati/Argentin, 2017; Dinkelman/Martinez, 2014; Hastings/Neilson/Zimmerman, 2015; Loyalka/Song/Wei/Zhong/Rozelle, 2015; McGuigan/McNally/Wyness, 2016; Oreopoulos/Dunn, 2012). In contrast to the research conducted in Europe, the rather broad appraisal of guidance counselling in the USA on different educational outcomes, including also college-enrolment, is noteworthy. Most studies examining guidance counselling show considerable positive effects on the analysed outcomes (e.g., Avery, 2013; Bettinger/Baker, 2014; Borghans/ Golsteyn/Stenberg, 2015; Castleman/Page/Schooley, 2014; Myers/Olsen/Steftor/Young/Tuttle, 2004). Additionally, scientific work that addresses the impact of more specific practical support on educational careers (e.g., Bettinger/Long/Oreopoulos/Sanbonmatsu, 2012; Castleman/Page, 2015; Carrell/Sacerdote, 2013) indicates that providing not only information but also support during decision-making and implementation of plans might be fruitful for fostering educational success.

1.3 Theory

Theoretical starting points for educational interventions that aim to reduce social disparities in educational decision-making can be derived from (i) sociological theories of educational decision-making and (i) psychological theories of motivation and volition.

(i) Due to their persuasive explanatory power, *rational choice theories* on educational decision-making are widely applied in sociological work on educational inequalities. To explain social disparities in the transition to educational tracks, Raymond Boudon (1974) introduced the distinction between social differentials in academic achievement (primary effects of social origin) and social differences in decision-making processes (secondary effects of social origin). The decision-making process is determined by the estimates of the costs and benefits for a specific educational path as well as by the subjective success probability for completing this track (e.g., Breen/Goldthorpe, 1997; Erikson/Jonsson, 1996). Several sociological studies indicate that these three components (costs, benefits, success probability) explain social disparities in university enrolment in Germany. The perceived costs and the estimated probability of success partly show greater explanatory power than the perceived benefits (Becker/Hecken, 2008; Lörz, 2012; Schindler/Reimer, 2010).

Only limited evidence exists on whether these subjective estimates can be influenced by educational interventions. Following theoretical considerations, socially diverging estimations reflect mainly objective differences in parental social status and thus disparities in financial, social, and cultural resources (Breen/Goldthorpe, 1997; Erikson/Jonsson, 1996). These considerations imply that information interventions are unlikely to produce changes in the evaluations of costs, benefits and probability of success. However, distortions and lack of information can also lead to socially different estimates from a theoretical viewpoint (Erikson/Jonsson, 1996). For instance, this would be the case if low-SES students were not fully aware of the public financial support for university attendance (i.e., the so-called 'BAföG' in Germany) and therefore rated the costs as rather high. Hence, from a theoretical standpoint, providing information could certainly have an impact on perceptions of costs, benefits, and success probability of university completion and, mediated by these estimates, on post-school educational decisions.

So far, there has been limited research on whether educational interventions have an impact on the perception of rational choice components. It is difficult to summarize the results in this research area because of the varying operationalizations (general estimates vs. subjective estimates), varying time intervals and different social origin groups that have been investigated. However, there is evidence that information workshops have an impact on the estimated benefits (Peter/Rusconi/Solga/Spieß/Zambre, 2016; Daniel et al., 2015), even though long-term effects are not always detectable (Daniel et al., 2015) and information sometimes leads to a reduction in the expected university returns for socially privileged students and has no effect on the estimates for socially disadvantaged students (Barone et al., 2017). Subjective estimates of the costs might also be reduced by information workshops (Barone et al, 2017; contrary find-

ing: Daniel et al., 2015). No effects on the subjective success probability have been found until now (Barone et al., 2017; Daniel et al., 2015).

Because within the program that is evaluated in the ZuBAb-study, guidance counsellors provide information on the benefits and costs of university completion and on the academic demands of university, changes in the rational-choice components might be the intervention's mode of action for enhancing the university enrolment of socially disadvantaged high school graduates.

(ii) In contrast to the outlined rational choice theories, in *psychological theories of motivation and volition*, researchers stress the fact that the stage of intention building is followed by the phases of forming a behavioral plan and plan execution (e.g., Achtziger/Gollwitzer, 2010).

Intention building is characterized by searching for and processing information. During this stage, the prioritization of information and the depth of processing depend on situational and individual factors. Making an informed educational decision involves obtaining information is are relevant to the person who decides. The match between the information that is delivered in educational interventions and the individual needs of participating students should be especially good in individual interventions as opposed to general information workshops.

Before putting an intention into practice, a concrete plan that includes procedural knowledge is necessary. Presumably, not all students possess the necessary knowledge of how to navigate the (formal) requirements of university enrolment. For instance, students may need support when filling out forms. This idea is supported by the work of Bettinger et al. (2012), who showed that practical support in filling out a request for financial support and direct feedback on the expected payment amount led to a significantly higher college enrolment rate in the USA. In contrast, general information on financial support showed no effect on college enrolment in that study.

Even if a behavioral plan that includes appropriate procedural knowledge exists, obstacles can hinder individuals from executing their plans and pursuing their long-term goals. Self-regulatory processes, during which the behaviour is monitored and corrected where inappropriate, support the determined execution of previously made plans. External support of self-regulatory processes can positively influence educational pathways. This is indicated by the work of Castleman et al. (2014): regular text messages that reminded students to submit a follow-up application had a positive effect on the continuation of studies. Another factor that might lead to a distraction from long-term goals is a change in the adversity of behavioral demands over time: an adverse event is experienced as more negative, as it becomes closer in time. Therefore, the task of applying for public financial support can be experienced as more unpleasant as the deadline moves closer (ibid: 322). Consequently, students with an intention to study can be distracted from their aspirations during the course of school or in the months between high school graduation and university enrolment if short-term obstacles attenuate their motivation for pursuing their initial long-term goals. Students who have never been quite sure about enrolling at university in the first place should be affected more strongly.

The process of decision-making regarding post-school pathways and the appropriate implementation and maintenance of these decisions is thus complex and might be challenging for young high-school graduates. Most university-eligible students might need advice and support during this life stage. While persons with university-educated parents can rather rely on parental assistance, students whose parents have not attended university could especially benefit from the support offered by high school guidance counsellors.

High school counselling programs such as the intervention that the ZuBAb study evaluates are adjusted to the needs of students in upper-secondary school and offer support during the decision-making process and the implementation of prior decisions. Because the counsellors provide one-to-one guidance, a good match between information on educational options and individual needs is promoted, information about concrete steps that are necessary for university enrolment can be targeted to the individual, and students can be supported in carrying out their initial long-term goals. Positive effects of such guidance counselling programs on different educational outcomes, including college-enrolment rates, have been shown in the USA (e.g., Avery, 2013; Bettinger/Baker, 2014; Borghans et al., 2015; Castleman et al., 2014; Meyers et al., 2004).

Whether guidance counselling is effective in Germany is currently not clear. To name only one distinct difference, the university enrolment process is less complex in Germany than it is in the USA: requirements between universities are more standardized than is the case in the USA, and financial support is mainly offered by one central government agency in Germany. Therefore, the ZuBAb study will answer the question of whether high school guidance counselling is fruitful in terms of enhancing the college enrolment of socially disadvantaged students not only in the USA but also in Germany.

2. Research Questions

The overarching question of the study is: **How does an intensive high school guidance-counselling program influence the post-school pathways of high school students?**

Therefore our research focuses on (i) the intervention's impact on post-school pathways under controlled conditions by means of a randomized controlled trial (RCT), scrutinizing the effects on college-enrolment (primary outcome) and on other educational outcomes, such as satisfaction with the educational choice, horizontal (gender-specific) choices of study major and type of vocational training, the development of socio-emotional competencies, rational choice components that are known to be influential for educational decisions (costs, benefits, and success probability), and the congruence between occupational interests and post-school educational choices (secondary outcomes). Furthermore, (ii) the intervention's effectiveness is determined by analysing the social composition of participating students under real world conditions.

3. Research Design

The ZuBAb study consists of (i) an efficacy analysis of the program under investigation by means of an RCT and (ii) an effectiveness analysis of whether the program reaches the target population under real world conditions by investigating teachers' nominations for program participation.

The study is being conducted in the German federal state of North Rhine-Westphalia in schools with a rather socially disadvantaged student body. Students are surveyed in four waves within a three-year panel, beginning with the first wave when students are in the first year of the two-year cycle of upper secondary school. A mixed mode design is applied (first wave: paper-pencil in the classroom; subsequent waves: online surveys).

Within the (i) efficacy analysis of the intervention's impact on post-school pathways students were selected into the trial based on the official definition of the target population, i.e. socially disadvantaged students. We used students' data from the first survey wave to identify the target population who would be part of the trial. Subsequently, students were randomized individually within schools into two parallel conditions, i.e., a treatment condition that involves program participation and a control condition with no intervention. To analyse spill-over effects, control schools in which the program is not delivered at all are also included. Measures are taken before (1st wave of panel study), during (2nd wave of panel-study) and after the treatment (3rd and 4th wave). In order (ii) to determine the degree the which the target population is reached by the program under real world conditions, teachers were asked to nominate students for program participation according to the official definition of the target group, as is common practice in the evaluated program under real world conditions. Pooling teachers' nominations with students' survey data makes it possible to scrutinize the social composition and other characteristics of the nominated students. Teachers' nominations have no impact on conducting the RCT.

In the following paragraphs, the program under investigation, the participants (at the school and individual levels), the survey design, and the procedure are described in more detail.

3.1 Program Under Investigation

The investigated guidance counselling program has been offered in the German federal state of North-Rhine Westphalia since 2011. It is funded by the Ministry of Culture and Science in the German State of North Rhine-Westphalia and is currently provided to over 340 schools with an upper secondary level throughout the entire federal state. The program is implemented by universities (traditional universities and universities of applied science), from which the guidance counsellors are sent out to the participating schools. A centre coordinates these activities and

offers a one-year extra-occupational training course for the counsellors, who usually hold a university degree in social work, social education, or other fields of study.

The program usually starts in the first year of a two-year cycle of upper secondary school (in German: *Qualifikationsphase 1*), is provided during high school, and individual program participation can even continue after high school graduation. The specially trained guidance counsellors visit the participating schools, where they offer one-to-one counselling sessions that address educational options after high school graduation, and the counsellors provide individual support for decision-making and decision-implementation. In addition to offering general information on post-school pathways, the counselling addresses, inter alia, students' occupational interests, goals, motivation, and competencies. Additional support can be provided, e.g., advice from persons in professional practice, advice concerning specific topics (e.g., scholarships), workshops to improve academic achievement, and counselling for parents. The counsellors understand themselves as low-threshold contact persons for all general and individual questions concerning post-school education.

In addition to enhancing university enrolment, the intervention aims to foster self-efficacy, competencies in problem solving, self-regulation, and achievement. The program targets socially disadvantaged students who show high to moderate performance levels and aims at reducing educational disparities in the transition to higher education. Under real world conditions, teachers nominate students for program participation based on the program's official definition of the target group and encourage these students to participate in the intervention. However, under real world conditions students have the opportunity to seek guidance counselling regardless of whether they are nominated by a teacher.

3.2 Survey Design

(i) Survey design for the efficacy analysis of how the intervention affects post-school pathways: All students participating in the ZuBAb study are being surveyed in a three-year panel design over the course of their high school graduation and transition to post-school educational pathways. The first wave, which also provides the baseline measurement for the RCT, took place at the beginning of the year 2018, when students attended the first year of the two-year cycle of upper secondary school. The first wave was conducted using a paper-pencil survey in the classroom. The treatment started shortly after the first wave. In all subsequent waves, students will be surveyed online. The second wave will take place at the beginning of 2019. At this time point, students will be close to their high school graduation. The third wave is planned to take place at the end of 2019. Between the second and the third wave, we expect most students to have made a decision regarding their post-school pathways. In addition, for most of the students the treatment will have ended between these two waves, although the program offers a continuation of support after the transition to the post-school educational track. Therefore, some students might continue to seek counselling after high school graduation. The fourth wave is planned for the end of 2020. Students who entered the post-school education immediately after

high school graduation will be in their second year of university and vocational training, respectively, at this time point.

(ii) Survey design for the effectiveness analysis of whether the program reaches the target population: At the time point of the first wave of the student survey, teachers' nominations for program participation were collected.

	Feb. 2018	May 2018	Feb. 2019	Oct. 2019	Oct. 2020
	1 1/2 year **before** graduation[1]	1 year **before** graduation	1/2 year **before** graduation	1/4 year **after** graduation	1 1/4 years **after** graduation
		Start of Treatment			
(i) Efficacy analysis (RCT)	1st Wave		2nd Wave	3rd Wave	4th Wave
Measurement	Baseline		during/after Treatment		
Mode	PAPI in class		CAWI	CAWI	CAWI
(ii) Effectiveness analysis	Data collection				

[1] 11th grade in academic-oriented schools and 12th grade in comprehensive schools

Tab. 1: Survey design

3.3 Participants

The study is being carried out in academic-oriented high schools (in German: *Gymnasien*) and comprehensive high schools (in German: *Gesamtschulen*) in the German federal state of North-Rhine Westphalia. The following description offers information on the sampling strategy and the numbers of participating schools and students. Because the study is currently being conducted, additional description numbers are presented for the first wave of the panel study.

Participating schools: In order to ensure a large share of socially disadvantaged students in the participating schools, which is consistent with the program's target group and with the general research focus on educational disparities, schools with a rather disadvantaged student body were selected for recruitment. The selection process used a school social index that is available for secondary schools in North-Rhine Westphalia (Schräpler/Jeworutzki, 2016). Out of the 125 schools that had been contacted for study participation, 53 schools were willing to participate. Due to the regional distribution of program supply, some schools that were willing to participate could not be included in the ZuBAb study. Eventually, 42 schools participate in the ZuB-Ab study.

(i) Efficacy analysis of how the program under investigation affects post-school pathways: The program under investigation is provided to 31 out of the 42 abovementioned schools. The effects of the intervention on students' educational pathways are mainly investigated within these 'treatment schools', within which students were randomized individually. For the purpose of investigating spill-over effects, 11 additional schools function as control schools, meaning that the treatment is not offered at all in these schools.

(ii) Effectiveness analysis of whether the program reaches the target population: All schools participating in the ZuBAb study were asked to participate in the effectiveness study on whether the program reaches the targeted group of students. A total of 28 schools delivered valid data on nominations. A summary of the number of schools, and a differentiation between academic-oriented and comprehensive high schools, is provided in the illustration given below.

Participation of schools	Academic-oriented	Comprehensive	Overall
Contacted schools	102	23	125
Schools willing to participate	42	11	53
Schools included in the ZuBAb study	31	11	42
(i) Efficacy analysis (RCT)			
Treatment schools	22	9	31
Control schools	9	2	11
(ii) Effectiveness analysis			
Schools that provided teachers' nominations	23	5	28

Tab. 2: Participation of schools in the ZuBAb study

Participating students: In order to guarantee a long-term treatment during high school, students who were attending the first year of upper secondary school at the time of the first wave and at baseline measurement, respectively (in German: *Qualifikationsphase 1*; 11th grade in academic-oriented high schools; 12th grade in comprehensive high schools), were defined as the investigated group. Therefore, students who attended the corresponding grades at baseline measurement are being surveyed. Overall, 1766 students filled out the questionnaires of the first wave.

(i) Efficacy analysis on how the program under investigation affects post-school pathways: Overall, 1609 students participated in the survey in the treatment schools and 157 students in the control schools. For the identification of socially disadvantaged students, we used information on the educational background and partly imputed data. Due to the school sampling procedure, students without college-educated parents were highly represented. In the RCT, students attending treatment schools were included in the trial ($N = 1404$) based on the official definition of the program's target group (see 3.2 for further details). This inclusion led to a large share of students without university-educated parents (over 50 percent of the students included in the trial do not have an academic background). Due to the 50/50 allocation ratio

into treatment conditions, 702 students are in the treatment condition and in the control condition respectively. (ii) In the effectiveness analysis of whether the program reaches the target population, data on 1184 students can be used.

Participation of students	Educational background: number of college-educated parents			Overall[1]
	0	1	2	
Participating students in participating schools	831	482	364	1766
(i) Efficacy analysis (RCT)				
Students in treatment schools	749	437	339	1609
Students included into the trial	749	391	203	1404
in treatment condition	373	194	103	702
in control condition	376	197	100	702
Students in control schools	82	45	25	157
(ii) Effectiveness analysis				
Students in schools that provided teachers' nominations	506	325	248	1129

[1] Small deviations to overall numbers are due to missing data after imputation.

Tab. 3: Participation of students in the ZuBAb study

3.4 Procedure

Preparation of the trial with funders and practitioners: The Ministry of Culture and Science of the German State of North Rhine-Westphalia as the funder of the study, the practitioners from the universities and the coordinating centre, in cooperation with the research team, prepared the trial with a specification of the principal goals of the evaluation and the research design. Additionally, the WZB Research Ethics Committee was involved in the development of the study, and the design was finally approved on 06 November 2017 by the committee.

Additionally, during the preparation phase, schools suitable for program participation were identified together with the practitioners. As the program supply is organized according to geographical regions, covered by the participating universities, the universities' catchment areas, the presence of schools suitable for the study according to their social composition and the practitioners' capabilities had to be taken into account. Furthermore, it was required that the program not have been delivered to the participating schools before the study began, as this would have hindered the randomization procedure. Because of the different parameters of university areas, program capacities and availability of suitable schools, as well as a rather wide expansion of the program before the beginning of the study the identification process took several months.

WZB Berlin Social Science Center
Reichpietschufer 50
10785 Berlin
Germany
www.wzb.eu

School recruitment: School recruitment took place in summer 2017. The recruitment was supported by the Ministry of Schools and Further Education of the German State of North Rhine-Westphalia, and the governments of three administrative districts. School principals received information about the goals and the approach of the ZuBAb study as well as information on contact persons within the research team via mail and telephone. Principals were also informed that study participation would involve the possibility of program delivery to their school. As a further incentive for study participation, a school-specific report on the study results was promised. After this initial recruitment by the research team, responsibility both for maintaining contact with the schools and for the data collection process was passed on to *infas*, a professional institute that conducts social surveys.

School principals who were not willing to participate communicated the following reasons to the research team: A lot of research is actually being carried out in the area where the study will take place. Because study participation is effortful for the schools, schools do not have the capabilities to participate in every study. The change of contact persons (research team to *infas*) was partly experienced as confusing and reduced commitment at the school level. Many principals perceived the delivery of the intervention as a relevant incentive for study participation, while others regarded the implementation of the intervention as a further (administrative) burden, which discouraged participation on their part.

Preparation of the 1ˢᵗ wave: All students attending the defined grades in the participating schools were targeted as the investigated group.
(i) Individual data collection as part of the RCT: In preparing the survey for the first wave, the schools received information packages for the students, which also contained information about the study's goals and its approach, information on data protection, and declarations of consent. Only after giving informed consent could students participate in the ZuBAb study. School principals or other teachers responsible for supporting *infas* during the study distributed the general information as well as the declaration of consent amongst students. The appointment for data collection in the classroom setting and all other aspects of the data collection (suitable room and time point) were coordinated between trained interviewers from *infas* and the teachers responsible for supporting the data collection.
(ii) Data collection for the effectiveness study on whether the program reaches the target population under real world conditions: A few weeks before the student survey took place, teachers were asked to list approximately 20 students attending the targeted grade who were suitable for program participation. The target group is students whose parents have not attended university. Amongst this group, the program especially targets high-performing students and students with a rather high achievement potential, as well as highly motivated, determined and/or curious persons. Teachers were informed about these criteria and about the fact that not all requirements have to be met in order to nominate a student. Teachers were encouraged to discuss the nomination with their colleagues, such as fellow teachers and other staff at the school, to facilitate well-informed decisions. Furthermore, teachers were informed that the data were relevant for research. Teachers prepared the nomination list prior to the first wave.

Conduct of the 1ˢᵗ wave: The data collection was organized by *infas*. It took place at the beginning of 2018.

(i) Individual data collection as part of the RCT: Trained interviewers carried out the paper-pencil surveys in the classroom. In addition to the standardized survey, students also took a standardized test on cognitive skills (Heller/Perleth 2000). The survey took at most 90 minutes, the test of cognitive skills included. If possible, surveys and tests were taken in small groups of no more than 30 persons in the morning. As has been mentioned before, students of the targeted grades were not obliged to take part in the study. Therefore, not all targeted students participated in the study for different reasons (e.g., lack of interest in the study, school absence). Because of a somewhat low response rates at the student level in some participating schools, schools with such low response rates were asked to repeat the data collection, offering students who had not yet participated opportunity to take part in the study. To raise the willingness to participate, a monetary incentive at the school level was offered to schools that exceeded a specific response rate. Four schools participated in the repeated measure. Eventually, the mean non-weighted response rate of students at the school level was 45 percent.

(ii) Data collection for the effectiveness study on whether the program reaches the target population under real world conditions: On the day when the first wave of the student survey was conducted in a certain school, the teachers in charge indicated (on a list of students who had consented to participate in the study) which students they had nominated for program participation. This step enabled merging teachers' nominations and individual student data (according to data protection guidelines) only for students who had consented to participate in the study.

Inclusion of participants in the RCT for the efficacy analysis: The data of the first wave were used to identify the participants for the trial. Students without university-educated parents were prioritized for inclusion in the trial. If data on educational background were missing, data were imputed from other characteristics associated with educational background (i.e., number of books in household, profession of parents, professional position of parents). Only if treatment places were left after all students without university-educated parents were included in the trail were the remaining places assigned to students with one or two university-educated parents and students with missing data after imputation. This prioritization led to a large share of students without university-educated parents: over 50 percent of the students included in the trial do not have an academic background (for further information, see 3.3 Participants). These students who were included in the trial were allocated randomly and individually (using educational background and school as blocking variables) in a 50/50 allocation ratio to the two treatment arms (no treatment/ control condition) by an external researcher employed at GESIS, Leibniz-Institute for Social Sciences. The assignment to treatment was disclosed shortly before treatment start.

Treatment and further waves: In the middle of 2018, the treatment started. All students who participated in the first wave will be surveyed in three subsequent waves by using online sur-

WZB Berlin Social Science Center
Reichpietschufer 50
10785 Berlin
Germany
www.wzb.eu

veys. To maintain a high willingness to participate at the student level, participation will be intensified monetarily per survey wave and with other forms of panel maintenance (summer and winter postcards, a USB stick as a pre-incentive in winter 2019).

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4. Appendix: Scales Manual

This manual provides readers with an overview of core scales, which were used in the ZuBAb study. The provided English translation is not an English adaption of the German scales. The English version of the items was never tested empirically.

Table of Contents

1. Occupational Aspirations

Theoretical Background

Occupational aspirations can be defined as a „set of preferences regarding future occupational roles and activities" (Hughes 2011, p. 1926, see also Lent et al. 1994). Occupational aspirations vary regarding their particular content, the social status linked to the occupation pursued by an individual, and the extent to which they meet socially shared (gender) role expectations (Hughes 2011, p. 1926).

Aspirations articulated by adolescents differ substantively from career aspirations children develop as aspirations have a greater influence on future careers (Hughes 2011, p. 1926, see also Auger et al. 2005; Gottfredson 1981). Aspirations develop during the phase of career exploration. Career exploration, on the one hand, requires reflection and information gathering on different career opportunities. On the other hand, it implies the exploration of the self, i.e., one's abilities, interests and goals (Hughes 2011, p. 1926; Kracke 2002, p. 19-20).

There are different strands of research to explain the development of occupational aspirations. One example is the *Social cognitive theory of career interest and choice* by R.W. Lent et al. (1994). They assume that occupation aspirations follow from a) individual self-efficacy expectations which can be realized by working in a certain field and b) outcomes resulting from working in a certain field. Self-efficacy expectations are important as human beings have an interest in engaging in activities they perceive manageable. Outcomes are relevant because human beings strive for actions that result in positive consequences.

Scale Development

Both items on realistic and idealistic occupational aspirations have been adopted from the Berliner-Studienberechtigten-Panel (Best Up) without modification.

Items

1. Imagine you could be whatever you want. What would be your favored profession?
2. Based on everything you currently know, what profession will you most likely have later on?

Scale: Open-ended question

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2. Vocational Interests

Theoretical Background

Vocational interests are at the core of John L. Holland's theory on personality types and environments (Holland 1966, 1973). His main theoretical considerations are (Gottfredson/Johnstun 2009, p. 103-104):

a) Vocational "environments" differ. They can be systematized. Thus, Holland distinguishes between six ideal-typical environments: _realistic_, _investigative_, _artistic_, _social_, _enterprising_, and _conventional_ (RIASEC) (Gottfredson/Holland 1991; Gottfredson/Johnstun 2009, p. 103; Gottfredson/Richards 1999, p. 59).

b) Individuals differ. These individual differences can be "characterized in terms of a typology of persons" (Gottfredson/Johnstun 2009, p. 103), too. This results in six ideal-typical personalities: _Realistic_, _Investigative_, _Artistic_, _Social_, _Enterprising_, and _Conventional_ (ibid.).

c) There exists an interaction between individuals and their environment. Individuals try to act according to their underlying personality types. Some environments, however, reward certain behaviors rather than others. Consequently, the fit between environments and persons varies. „Thus, people who are self-confident, attention-seeking and energetic (enterprising type) seek out environments in which these traits can be expressed into occupational roles […] (enterprising occupations)" (Furnham 2001, p. 11). The better person and environment are suited to each other, the more satisfied a person is regarding her occupational choice (Holland 1966, 1973).

Scale Development

Holland has developed various tools to determine which personality type a person is most likely to belong to. In German-speaking countries, the adaptation according to Bergmann and Eder (2005) (AIST-R, _Allgemeiner Interessen Strukturtest – Revision_) is the most popular (Nagy et al. 2010). Following Holland's theory on personality types, the AIST-R assesses the six different interest dimensions, as well. The original AIST-R comprises a total of 60 items. A shortened version can be found in the _National Educational Panel Study_ (NEPS), Starting Cohort 4 (SC4). The ZuBAb-Study uses the version of the NEPS with a slightly different starting question and a different scaling.

Items

How interested are you in the following things?
(Bitte geben Sie an, wie sehr Sie sich für die folgende Tätigkeiten interessieren.)

1. construct or assemble something (*realistic*)
   (etwas aufbauen oder zusammensetzen)
2. observe and analyze something meticulously (*investigative*)
   (etwas genau beobachten und analysieren)
3. paint pictures or draw (*artistic*)
   (Bilder zeichnen)
4. take a stand for other people's concerns (*social*)
   (sich für die Anliegen anderer einsetzen)
5. negotiate with other people (*enterprising*)
   (mit anderen Menschen verhandeln)
6. keep records or lists on something (*conventional*)
   (über etwas Aufzeichnungen oder Listen führen)
7. manufacture something according to a plan or a sketch (*realistic*)
   (etwas nach einem Plan oder nach einer Skizze anfertigen)
8. conduct experiments in a laboratory (*investigative*)
   (in einem Versuchslabor Experimente durchführen)
9. design something artistically (*artistic*)
   (etwas nach künstlerischen Gesichtspunkten gestalten)
10. provide for sick or injured people (*social*)
    (kranken Menschen helfen)
11. present a cause in public (*enterprising*)
    (für eine Sache in der Öffentlichkeit auftreten)
12. collect, order, or administrate things (*conventional*)
    (Dinge zählen und sortieren)
13. to work on metal/wood, to produce something from metal/wood (*realistic*)
    (Metall/Holz bearbeiten, etwas aus Metall/Holz herstellen)
14. examine something under a microscope (*invesitgative*)
    (etwas durch ein Mikroskop betrachten)
15. read and interpret poetry/literature (*artistic*)
    (Dichtung/Literatur lesen und interpretieren)
16. take care of needy children or adults (*social*)
    (hilfsbedürftige Kinder oder Erwachsene betreuen)
17. get others to do something (*enterprising*)
    (anderen sagen, was sie machen sollen)
18. monitor the adherence to principles (*conventional*)
    (die Einhaltung von Richtlinien überwachen)

<u>Scale</u>: 1 = "not at all" (überhaupt nicht) – 5 = "very much" (sehr stark)

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3. Educational Aspirations

Theoretical Background

In general, aspirations can be defined as "cognitive orientational aspect of goal-directed behavior" (Haller 1968, p. 484). With regard to vocational and educational aspirations, a distinction is usually made between idealistic and realistic aspirations. Idealistic aspirations are aimed at achieving specific educational attainments or occupations that a person desires regardless of any limiting conditions such as grades, costs, etc. (Kurz/Paulus 2008, p. 5491; Stocké 2013, p. 269). Realistic aspirations refer to goals that appear realistic to a person, taking into account any restrictive conditions (ibid.).

According to recent research the level of aspirations is stratified along social class lines and educational background. It also emphasizes the importance of the status preservation motive and a socially dependent evaluation of costs and benefits for the genesis of educational aspirations (Relikowski et al. 2012, p. 112, see also: Kurz/Paulus 2008; Paulus/Blossfeld 2007). In general, high educational aspirations are positively related to academic achievements, and eventually are related to the realization of demanding educational qualifications (Stocké 2013, p. 269f.).

Scale Development

The scales for idealistic and realistic educational aspirations are based on corresponding instruments in the *Berliner-Studienberechtigten-Panel* (*Best Up*), NEPS (SC4) and BiKS 8-14 (wave 7 and 8). In those surveys, respondents were asked what type of educational or vocational training they want to do and what type they will actually do. Due to the assumption that two years before graduation the students are not definitively certain about their plans different aspects have been further differentiated in the ZuBAb-study. Therefore the students were asked for both educational pathway (study and vocational training) separately. Thus, it was first assessed how much the interviewees wish to study and in which field of study. Then, they were asked to tap how realistic they think it is for them to take up an academic degree and what would be the most realistic field of study. In a second step, these two questions were asked with regard to vocational training.

Items

Higher Educational Aspiration
1. How much would you like to pursue a higher education?
   (Wenn es allein nach Ihren Wünschen ginge: Wie sehr würden Sie sich wünschen zu studieren?)
2. Make an estimate: How likely is it that you will actually embark on higher education later on?
   (Was glauben Sie: Wie wahrscheinlich ist es, dass Sie tatsächlich studieren werden?)

Scale for 1.: 1 = "not at all" (überhaupt nicht)– 5 = "very much" (sehr)
Scale for 2.: 1 = "very unlikely" (sehr unwahrscheinlich) – 5 = "very likely" (sehr wahrscheinlich)

Field of Study
1. What subject would you most like to study?
   (Welche Studienrichtung möchten Sie am liebsten studieren?)
2. What subject will you most likely study later on?
   (Welche Studienrichtung werden Sie tatsächlich studieren?)

Scale: one-choice list box + free-text field

Vocational Training
1. How much would you like to take up vocational training?
   (Wenn es allein nach Ihren Wünschen ginge: Wie sehr würden Sie sich wünschen, eine berufliche Ausbildung zu machen?)
2. Make an estimate: How likely is it that you will actually take up vocational training later on?
   (Was glauben Sie: Wie wahrscheinlich ist es, dass Sie tatsächlich eine berufliche Ausbildung machen werden?)

Scale for 1.: 1 = "not at all" (überhaupt nicht) – 5 = "very much" (sehr)
Scale for 2.: 1 = "very unlikely" (sehr unwahrscheinlich) – 5 = "very likely" (sehr wahrscheinlich)

Occupation that requires Training
1. In which profession that requires vocational training would you most like to do an apprenticeship?
   (In welchem Ausbildungsberuf würden Sie am liebsten eine berufliche Ausbildung aufnehmen?)
2. In which profession that requires vocational training will you most likely do an apprenticeship later on?
   (In welchem Ausbildungsberuf werden Sie tatsächlich eine berufliche Ausbildung aufnehmen?)

Scale: one-choice list box + free-text field

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4. Ideational Value of Education

Theoretical Background

The ideational value attributed to education reflects a generalized attitude towards. The personal, ideational attitude signals „how positively individual skills and characteristics associated with higher education as well as their social outcomes are assessed" (Stocké 2014, p. 5, own translation). Thus, the ideational value of higher education does not reflect as how beneficial persons evaluate education in terms of its returns. Rather, the idea behind this construct is to assess to which extend education is thought of as an end in itself (ibid.).

Considerations on individual values on education influencing educational decision-making were first expressed by scholars from the Wisconsin school (Sewell et al. 1957, 1969, 1970). More recent approaches are the *Motivation and Opportunity as Determinants*-Modell (MODE-Modell) (Fazio 1990) as well as the *Modell of Frame Selection* (Esser 2000).

Scale Development

The developed scale reflects attitudes that evolved within the educated middle-class during the development of higher education in the 19th century and are supposed to be widespread also in nowadays among high social classes. To this end, a literature review was conducted in order to distinguish attitudes towards education held by the educated middle-class. This review yielded the following dimensions: knowledge as an end in itself; holistic knowledge; freedom of science; high significance of art in general; high significance of a traditional canon of art; freedom of art. Every dimension is covered by several items.

Items

Generally speaking, what is your view on science and culture? Do you believe that …
(Was denken Sie im Allgemeinen über Wissenschaft und Kultur? Stimmen Sie zu, ...)

1. … one should primarily focus on questions that contribute to the solution of practical problems?
    (… dass man sich vor allem mit Fragen beschäftigen sollte, die zur Lösung praktischer Probleme beitragen?)
2. … it is desirable to acquire knowledge in many different areas?
    (… dass es erstrebenswert ist, sich in vielen verschiedenen Bereichen Wissen anzueignen?)
3. … the state should control what kind of research is being conducted in a country's universities?
    (… dass staatlich kontrolliert werden sollte, wozu an Hochschulen geforscht wird?)
4. … art (i.e., music, poetry, paintings) can be meaningful even if a lot of people see no sense in it?
    (… dass Kunst (z.B. Musik, Gedichte, Gemälde) auch dann sinnvoll sein kann, wenn viele Personen nichts damit anfangen können?)
5. … research sometimes deals with issues nobody cares about?
    (… dass in der Wissenschaft manchmal Dinge erforscht werden, die kein Mensch braucht?)
6. … it is important to be familiar with the works of well-known writers (e.g., Goethe, Shakespeare)?
    (… dass es wichtig ist, die Werke bekannter Schriftstellerinnen und Schriftsteller zu kennen (z.B. Goethe, Shakespeare)?)
7. … art should be financially supported by the state (e.g., by grants for theatres, museums)?
    (… dass Kunst und Kultur staatlich gefördert werden sollte (z.B. Zuschüsse für Theater, Museen)?)
8. … it is valuable to learn something about a topic, even if one doesn't know if one will need it later in life?
    (… dass es wertvoll sein kann, etwas zu lernen, von dem man nicht weiß, ob man es später braucht?)
9. … science (i.e., chemistry, biology) is more valuable than the humanities (e.g., history, literary studies)?
    (… dass Naturwissenschaften (z.B. Chemie, Biologie) wertvoller sind als Geisteswissenschaften (z.B. Geschichte, Literaturwissenschaft)?)
10. … it is valuable to try something new in art (e.g., in theatres, in music)?
    (… dass es wertvoll ist, wenn man in der Kunst (z.B. Theater, Musik) Neues austestet?)
11. … it is a positive sign if many people take part in cultural life (e.g., by visiting theatres or museums)?
    (… dass es positiv ist, wenn viele Menschen an Kultur teilhaben (z.B. durch Theater- oder Museumsbesuche)?)

Scale: 1 = "completely disagree" (stimme gar nicht zu) – 5 = "completely agree" (stimme völlig zu)

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5. Forms of Capital

Capital, following Pierre Bourdieu, is a material or incorporated form of "accumulated labor" (Bourdieu 2009, p. 111). The distribution of capital corresponds to "the immanent structure of the social world" (ibid., own translation). To fully understand this structure, all forms of capital must be taken into consideration. Therefore, in his analysis Bourdieu differentiates between economic, cultural, and social capital (ibid.; see also Müller 2014, p. 47ff.).

5.1 Cultural Capital

Theoretical Background

The core elements of cultural capital are education and knowledge. These core elements can take different forms or find expression in different ways. Bourdieu therefore differentiates once again between incorporated cultural capital, objectified cultural capital, and institutionalized cultural capital (Bourdieu 2009, p. 113). The former has been acquired through internalization during the process of socialization or education. It has become a permanent disposition of a person and manifests itself in concrete skills. The amount of cultural capital can be determined by the degree of distinction resulting from it. It is expressed in the personality, morals, tastes or lifestyles of a person (ibid., p. 114). The objectified cultural capital is typically associated with art objects, books, or musical instruments – ergo material representations of education and knowledge that can, at least in their material form, be acquired by purchase or inheritance. Their value is measured by their aura, that is, by the value they air (ibid., p. 116ff.). By institutionalized cultural capital, Bourdieu means titles and certificates which formally confirm a person's possession of knowledge. Their value is measured by the rarity of the title awarded or the reputation of the institution where the knowledge was acquired (ibid., p. 118ff.). Just like other forms of capital, cultural capital can, under certain conditions, be converted into another species of capital. In addition, intergenerational transmission processes take place as cultural capital is passed on within families, for example. Especially these mechanisms make the distribution of cultural capital interesting for educational research (ibid., p. 114).

Scale Development

The assessment of extracurricular activities fostering the acquisition of cultural capital is based on the NEPS (SC4) questionnaire as well as on the study *Transformation des Sekundarschulsystems und akademische Karriere* (TOSCA). The items used in these two studies were combined into a new scale. In some cases, the wording was slightly adapted to the current language usage habits. The initial question was adopted from NEPS with only slight modification.

The items on the different topics respondents may talk about with their parents were adopted from the NEPS (SC4). However, an item for conversations on natural sciences was added to cover a wider range of topics. The same items were used to assess the topics respondents speak about with friends. The idea to include friends as a relevant reference group as well was adopted from the TOSCA study.

Items

Participation in high culture in the last 12 months:

How often have you done the following things in the past 12 months?
(Wie oft haben Sie in den vergangenen 12 Monaten folgende Dinge außerhalb der Schule getan?)

1. Visited a museum or an art exhibition
   (ein Museum oder eine Kunstausstellung besucht)
2. Watched a movie at the cinema
   (im Kino einen Film gesehen)
3. Attended an opera, a ballet, or a classical concert
   (eine Oper, ein Ballett oder ein klassisches Konzert besucht)
4. Attended a theatre
   (ein Theaterstück gesehen)
5. Attended a rock or pop concert
   (ein Rock- oder Popkonzert besucht)
6. Visited a library
   (eine Bibliothek aufgesucht)
7. Attended a public talk or discussion
   (einen öffentlichen Vortrag oder eine Diskussionsrunde besucht)

Scale: 1 = "never" (nie) – 5 = "more than 5 times" (mehr als 5-mal)

Discussions with parents:

How often does it normally happen that you talk with your parents about …
(Wie oft kommt es im Allgemeinen vor, dass Sie mit Ihren Eltern …)

1. … books?
   (… über Bücher reden?)
2. … movies or TV shows?
   (… über Filme oder Fernsehsendungen reden?)
3. … political or social issues?
   (… über politische oder soziale Fragen reden?)
4. … works of art or art in general?
   (… über Kunstwerke oder Kunst im Allgemeinen reden?)
5. … natural sciences?
   (… über naturwissenschaftliche Phänomene reden?)

Scale: 1 = "Never or rarely" – 5 = "everyday"

Discussions with friends:

How often does it normally happen that you talk with your friends about …

(Wie oft kommt es im Allgemeinen vor, dass Sie mit Ihren Freundinnen und Freunden …)

1. … books?
    (… über Bücher reden?)
2. … movies or TV shows?
    (… über Filme oder Fernsehsendungen reden?)
3. … political or social issues?
    (… über politische oder soziale Fragen reden?)
4. … works of art or art in general?
    (… über Kunstwerke oder Kunst im Allgemeinen reden?)
5. … natural sciences?
    (… über naturwissenschaftliche Phänomene reden?)

<u>Scale</u>: 1 = "never or rarely" (nie oder selten) – 5 = "everyday" (täglich)

Items at home:

At home, do you have …

(Gibt es bei Ihnen zu Hause …)

1. … a desk for studying?
    (… einen Schreibtisch zum Lernen?)
2. … your own room?
    (… ein Zimmer für sich allein?)
3. … your own computer?
    (… einen PC oder Laptop für Sie allein?)

<u>Scale</u>: 1 = "Yes" (Ja) – 2 = "No" (Nein)

Amount of books at home:

1. Around how many books do your parents have at home?
    (Wie viele Bücher besitzen Ihre Eltern?)

<u>Scale</u>: 1 = "none" (keine) – 7 = "more than 500" (mehr als 500)

5.2 Social Capital

Theoretical Background

On the one hand, a person's social capital depends on the extent of her relationship network, on the other hand it is depending on the capital volume the persons in the particular relationship network represent (Bourdieu 2009, p. 119). Therefore, the core elements of social capital are the relationships a person has established. These relationships acquire and are maintained through constant work, i.e. the exchange of material and immaterial goods (ibid., p. 121). Furthermore, social capital can also be converted into economic or cultural capital (cf. ibid., p. 119ff.).

Scale Development

The resource generator (Snijders 1999; Van der Gaag/Snijders 2005; Van der Gaag et al. 2008) is an instrument for the measurement of individual social capital. The resource generator builds on the position generator that only measures the (occupational) position of the members of a network an individual has (Lin/Dumin 1986; Lin/Erikson 2008, Lin et al. 2001; Van der Gaag et al. 2008). In comparison to that, the resource generator asks for concrete access – via persons in the individual's network – to social support and identifies opportunities for mobilizing specific support (Van der Gaag/Snijders 2005, p. 2f.). Due to the lack of addressing social networks that explicit help with educational decisions and realization of educational plans four new items were formulated in the manner of the resource generator. According to the student survey of the NEPS, the students were additionally asked about persons in their social environment with certain educational degrees to measure the potential available social capital regarding exchange of experience and support with the different educational pathways (NEPS SC4 wave 5 and 6). In the ZuBAb questionnaire this questions are asked separately for the cycle of friends and family members.

Items

Social Capital – Supportive Behavior

In the following, scenarios in which people may receive support from persons in their environment are being described. Do you know anyone …

(Im Folgenden sind einige Situationen beschrieben, in denen Menschen andere Personen unterstützen. Kennen Sie jemanden, …)

1. … with whom you can talk about problems in school?
   (… mit dem Sie schulische Probleme besprechen können?)
2. … who encourages you to educate yourself?
   (… der Sie ermuntert, sich zu bilden?)
3. … who would help you with an application for an apprentice position?
   (… der Ihnen bei der Bewerbung um einen Ausbildungsplatz helfen würde?)
4. … who would help you with an application for a place at university?
   (… der Ihnen bei der Bewerbung um einen Studienplatz helfen würde?)

<u>Scale</u>: 1 = "Yes" (Ja) – 2 = "No" (Nein)

Social Capital – Higher education/Vocational training

How many of your friends …

(Wie viele Ihrer Freundinnen und Freunde haben …)

1. … have studied, are studying at the moment, or want to study?

   (… studiert, studieren gerade oder haben vor zu studieren?)

2. … did a vocational training program, are doing a vocational training at the moment, or want to take up vocational training?

   (… eine berufliche Ausbildung gemacht, machen gerade eine berufliche Ausbildung oder haben vor, eine berufliche Ausbildung zu machen?)

Scale: 1 = "none of them" (keine) – 7 = "all of them" (alle)

How many people in your family …

(Wie viele Personen aus Ihrer Verwandtschaft haben …)

1. … have studied, are studying at the moment, or want to study?

   (… studiert, studieren gerade oder haben vor zu studieren?)

2. … did a vocational training program, are doing a vocational training at the moment, or want to take up vocational training?

   (… eine berufliche Ausbildung gemacht, machen gerade eine berufliche Ausbildung oder haben vor, eine berufliche Ausbildung zu machen?)

Scale: 1 = "none of them" (keine) – 7 = "all of them" (alle)

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6. Cognitive Competences

Theoretical Background

To measure students' cognitive competences, the ZuBAb study used the Cognitive Ability Test (Kognitiver Fähigkeitstest, KFT) 4-12+R (Heller/Perleth 2000). It was designed for students from grades 4 to 12 in secondary schools (ibid., p. 8). The KFT 4-12 + R consists of multiple subtests that determine the verbal, quantitative, and figurative-spatial competences of the interviewees through different tasks.

Scales Development

The KFT 4-12+R builds on the *Cognitive Abilities Test for Grades 4 to 13* (KFT 4-13) which is a German application of the *Cognitive Ability Test* developed by Thorndike and Hagen (1971, 1993). The test by Thorndike and Hagen in turn builds on the *Lorge Thorndike Intelligence Test* designed by Lorge, Thorndike and Hagen (1964). In 1998, Heller and Perleth revised the KFT 4-13. The result of this revision is the KFT 4-12+R (Heller/Perleth 2000, p. 12f.).

Items

In the ZuBAb study, the two subtests "word analogies" (V3) and "figure analogies" (N2) from the KFT 4-12+R were used (ibid., p. 10). The first test measures the verbal competences. Students are confronted with a pair of words which introduces a certain relationship between these words. From a range of words, they then have to decide which two words represent the same kind of relationship. The second subtest "figure analogies" works similar: Two given figures stand in a certain relationship to each other. Students then have to select which other figure from a range of examples fits to a third figure in the way the first pair functions (ibid., p. 10).

References

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7. Life Goals

Theoretical Background

According to Pöhlmann et al. (2010), goals in general can be understood as desired states and events that give direction, energy, and purpose to behavior (p. 70). They give meaning and structure to life (ibid.). Goals can be differentiated according to different levels of abstraction. Abstract, long-term goals are called 'life goals'. These goals serve to organize and direct individual life planning and have an impact on individual decision-making (ibid.; Chang et al. 2006; Heckhausen 1997; Heckhausen/Schulz 1995). Typical life goals individuals develop during late adolescence are completion of education, career choice or starting a family (Nurmi 1991). Other typical life goals that are also mentioned in this phase of development are self-realization, professional success, or the acquisition of material possessions (ibid.). Often the life goals that individuals set themselves reflect social norms and values (ibid., Heckhausen 1997; Heckhausen/Schulz 1995).

Scales Development

The measurement of individual life goals in the ZuBAb study is based primarily on the instrument used in the *Socio-Economic Panel* (SOEP). It was extended by items from the Life Goal Questionnaire GOALS (Pöhlmann/Brunstein 1997). The instrument used in the SOEP is based on the work of Kluckhohn and Strodtbeck (1961) which addresses three categories of possible goals: materialistic and success-oriented goals, altruistic goals, and goals related to family life (Headey 2008, p. 219). Pöhlmann and Brunsteins' work is based on the considerations by Wicker et al. (1984) and Novacek and Lazarus (1990). Their questionnaire covers six broad categories of life goals: intimacy, affiliation, altruism, performance, power, and diversion (Pöhlmann et al. 2010, p. 71).

Items

Different people value different things. How important are the following things to you for the future?
(Verschiedenen Menschen sind verschiedene Dinge wichtig. Wie wichtig sind Ihnen die folgenden Dinge für Ihr späteres Leben?)

1. Being able to afford to buy things for myself
   (sich etwas leisten können)
2. Being fulfilled
   (sich selbst verwirklichen)
3. Being successful in my career
   (Erfolg im Beruf haben)
4. Own a house
   (ein eigenens Haus haben)
5. Having a happy marriage/partnership
   (eine glückliche Ehe/Partnerschaft haben)
6. Spend a lot of time with other people
   (viel mit anderen Menschen unternehmen)
7. Having children
   (Kinder haben)
8. Engage in politics or taking a stand on social issues
   (sich politisch, gesellschaftlich einsetzen)
9. Seeing the world and/or traveling extensively
   (die Welt sehen, viele Reisen machen)
10. Faith/Religion
    (der Glaube, die Religion)
11. Achieving a high social status
    (einen hohen sozialen Status besitzen)
12. Continually developing my skills and abilities
    (die eigenen Fähigkeiten fortlaufend weiterentwickeln)

Scale: 1 = "not at all important" (sehr unwichtig) – 5 = "very important" (sehr wichtig)

References

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8. Risk Aversion

8.1 General Risk Aversion

Theoretical Background

General risk aversion is a manifestation of an individual's attitude towards risks. Depending on which theoretical approach is used, the individual risk aversion is attributed to the framing conditions given in a certain situation (Kahneman/Tversky 1979), an individual's personality (Hollenbeck et al. 1994), or a combination of situation and personality (Weber/Milliman 1997; Weber et al. 2002).

Scales Development

The „general risk question" (Dohmen et al. 2001, p. 523) is a situation-independent self-assessment of the respondents' personal handling of risks (ibid.). For the authors, this item represents a simple, efficient way of measuring risk aversion that achieves results which are as valid as more complex options such as lottery simulations (ibid.). The related item in the ZuBAb study was adopted from the SOEP with slight modification regarding the exact question and scaling. If one is interested in specific situations in which decisions must be taken under conditions of uncertainty and risk, survey instruments adjusted to these situations lead to much more valid results (ibid., p. 543). For this reason, another context-specific instrument was developed (for more information see: Domain-specific risk attitude, p. 154).

Items

How do you see yourself?
(Wie schätzen Sie sich persönlich ein:)

1. Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?
   (Wie risikobereit sind Sie im Allgemeinen?)

Scale: 1 = "not risk averse at all" (gar nicht risikobereit) – 7 = "fully prepared to take risks" (sehr risikobereit)

References

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8.2 Domain-specific risk attitude

Theoretical Background

Besides the general risk aversion (see section on General Risk Aversion, p. 143) researchers also considered attitude towards risks that are applies in specific situations only. According to Weber et al. (2002) as well as Johnson et al. (2004), there exists both general and situational or sector-specific pattern of risk behaviors. Therefore, Weber et al. (2002) consider different "risk domains" (p. 276).

Scales Development

Due to the lack of an instrument that is explicit addressing educational decisions, we developed a scale with nine items regarding post-secondary education on a base of the existing concept of *Domain-specific risk attitude[3]* (Johnson et al. 2004, Wagner et al. 2002). Hence we transferred the logic of different "risk domains" as well as the basic structure of the DOSPERT-G scale to the context of post-secondary educational decisions. Therefore the new nine items include four different dimensions that address risk according to educational decisions: social costs, financial costs, probability of success, and employment prospects and conditions. Regarding each behavior it is measured how likely it is for respondents to engage in the behavior according a selected educational pathway.

Items

How likely do you think it is, generally speaking, that you will choose a post-secondary education …
(Ganz allgemein gesprochen: Wie wahrscheinlich ist es, dass Sie einen nachschulischen Bildungsweg aufnehmen würden …)

1. … that deviates from your parents' expectations? (*social costs*)
   (… der von den Vorstelllungen Ihrer Eltern abweicht?)
2. … after which a lot of people end up unemployed? (*employment prospects and conditions*)
   (… nach dessen Abschluss viele Menschen keinen Arbeitsplatz finden?)
3. … that you will only finish successfully if you put a lot of effort to it? (*probability of success*)
   (… den Sie nur erfolgreich abschließen, wenn Sie sich sehr anstrengen?)
4. … for which you would have to move far away? (*financial costs/social costs*)
   (… für den Sie weit weg ziehen müssen?)
5. … that prepares you for a profession most people in your personal environment meet with disapproval? (*social costs*)
   (… der auf einen Beruf vorbereitet, der in Ihrem persönlichen Umfeld auf wenig Zuspruch stößt?)
6. … even students who did very well at school failed to finish successfully? (*probability of success*)
   (… den auch sehr gute Schülerinnen und Schüler nicht geschafft haben?)
7. … that prepares you for a profession which not necessarily promises you financial security? (*employment prospects and conditions*)
   (… der auf Berufe vorbereitet, die nicht unbedingt mit finanziellen Sicherheiten verbunden sind?)

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[3] The *Domain-specific risk attitude* (DOSPERT) *scale* developed by Wagner et al. (2002) and Johnson et al. (2004) includes questions on risky behavior in the five areas sport and leisure, social affairs, ethics, finance, and health.

8. … That prepares you for a profession which may be linked with tasks you don't like? (*employment prospects and conditions*)
    (… der auf Berufe vorbereitet, in denen Sie unter Umständen Tätigkeiten übernehmen müssen, die Ihnen keinen Spaß machen?)

9. … that prepares you for a profession about which you can talk to anybody in your personal environment because nobody has any experience with it? (*social costs*)
    (…über den Sie mit niemandem aus Ihrem persönlichen Umfeld reden können, weil sich keiner damit auskennt?)

Scale: 1 = "very unlikely" (sehr unwahrscheinlich) – 5 = "very likely" (sehr wahrscheinlich)

References

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9. Academic Self-Concept

Theoretical Background

Academic self-concept (or: self-concept of academic ability) can be defined as the "totality of cognitive representations of one's own abilities in academic achievement situations (e.g., at school or university)" (Dickhäuser et al. 2002, p. 394, own translation). These cognitive representations allow for receiving, evaluating, and processing stimuli related to academic achievement situations. For instance, they enable individuals to conclude "I am clever", "I am gifted", or "I am smarter than my classmates" (ibid.). The self-concept derived from these conclusions has an impact on the level of one's own future expectations of success. Furthermore, they can influence the decisions on future educational pathways and, in certain contexts, also influence an individual's future educational achievements (ibid.; Dickhäuser 2001; Eccles et al. 1982; Spinath/Stiensmeier-Pelster 2000).

Scale Development

In the ZuBAb study, a shortened version of the scale developed by Dickhäuser et al. (2002) measuring the academic self-concept of pupils was applied. On the one hand, the selected items ask respondents to rate their own skills and abilities in comparison with their classmates' abilities or relative to the demands they have to meet at school. On the other hand, the items measure pupils' absolute assessment of their own abilities (ibid., p. 397).

Items

To what extent do the following statements apply to you?
(Hier geht es darum, wie Sie sich selbst einschätzen. Wie sehr treffen die folgenden Aussagen auf Sie zu?)

1. If I think about what is expected from us at school, I perceive myself as … not gifted at all/very gifted.
    (Wenn ich mir angucke, was wir in der Schule können müssen, halte ich mich für … nicht begabt./sehr begabt.)
2. If I think about what is expected from us at school, I have the impression that I can … not cope with the tasks at school/cope with the tasks at school very well.
    (Wenn ich mir angucke, was wir in der Schule können müssen, finde ich, dass ich … nicht gut zurecht komme./gut zurecht komme.)
3. If I think about what is expected from us at school, I have the impression that I … don't have a lot of abilities/have lots of abilities.
    (Wenn ich mir angucke, was wir in der Schule können müssen, finde ich, dass ich … wenig kann./viel kann.)
4. I am … not gifted for school/very gifted for school.
    (Ich bin für die Schule … nicht begabt./sehr begabt.)
5. I am … not intelligent at all/very intelligent.
    (Ich bin … nicht intelligent./sehr intelligent.)
6. In school, I know … little/much.
    (Ich kann in der Schule … wenig./viel.)
7. I think I am … less gifted for school than my classmates/more gifted for school than my classmates.
    (Ich denke, ich bin in der Schule … weniger begabt als meine Mitschülerinnen und Mitschüler./begabter als meine Mitschülerinnen und Mitschüler.)
8. My classmates have … less problems /more problems coping with the tasks at school.
    (Mit den Aufgaben in der Schule komme ich … schlechter zurecht als meine Mitschülerinnen und Mitschüler./besser zurecht als meine Mitschülerinnen und Mitschüler.)
9. At school, my classmates have … less abilities/more abilities.
    (Ich kann in der Schule … weniger als meine Mitschülerinnen und Mitschüler./mehr als meine Mitschülerinnen und Mitschüler.)

Scale: 1 – 5; response options as noted above.

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10. Self-Efficacy

10.1 General Self-Efficacy

Theoretical Background

Self-efficacy is a concept based on the social cognitive theory by Albert Bandura (1992, 1997, 2001). It can be understood as the subjective certainty of being able to cope with novel or difficult situations as well as adversity because of one's competences (Schwarzer/Jerusalem 2002, p. 35). Thus, it reflects an optimistic self-belief (Schwarzer 1992). Situations in which self-efficacy becomes relevant cannot be handled by applying routine behaviors, but require extraordinary effort and perseverance (Schwarzer/Jerusalem 2002, p. 35). Thus, high general self-efficacy is considered to be a contributing factor for long-lasting, efficient self-regulation as it promotes "active, adaptive, and problem-oriented forms of dealing with stressful situations" (Schwarzer/Jerusalem 2002, p. 31, own translation; see also Schwarzer/Jerusalem 1999, p. 57; Jerusalem et al. 2009, p. 14f.).

Scales Development

The original scale for measuring a person's general self-efficacy was developed by Jerusalem and Schwarzer in 1979. Since then, however, it has been revised several times (Jerusalem/Schwarzer 1999; Jerusalem et al. 2009; Schwarzer/Jerusalem 1995). Generally, each item of the scale describes a skill related to successfully coping with a situation (e.g.: "I can always manage to solve difficult problems if I try hard enough"). Respondents then need to indicate to which extent they can relate to these descriptions. The ZuBAb study used a total of 10 items from the 1999 and 2009 version of the scale developed by Schwarzer and Jerusalem. The scale was modified and ranges from 1 – 5 in the ZuBAb study.

Items

These questions are about your personal judgements and feelings. To what extent do the following statements apply to you?
(Hier geht es um Ihre persönlichen Einschätzungen und Gefühle. Wie sehr treffen die folgenden Aussagen auf Sie zu?)

1. If someone opposes me, I can find the means and ways to get what I want.
   (Wenn sich Widerstände auftun, finde ich Mittel und Wege, mich durchzusetzen.)
2. I can always manage to solve difficult problems if I try hard enough.
   (Die Lösung schwieriger Probleme gelingt mir immer, wenn ich mich darum bemühe.)
3. It is easy for me to stick to my aims and accomplish my goals.
   (Es bereitet mir keine Schwierigkeiten, meine Absichten und Ziele zu verwirklichen.)
4. I am confident that I could deal efficiently with unexpected events.
   (In unerwarteten Situationen weiß ich immer, wie ich mich verhalten soll.
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.
   (In unerwarteten Situationen weiß ich immer, wie ich mich verhalten soll.)
6. I can remain calm when facing difficulties because I can rely on my coping abilities.
   (Schwierigkeiten sehe ich gelassen entgegen, weil ich meinen Fähigkeiten immer vertrauen kann.)
7. I can usually handle whatever comes my way.
   (Was auch immer passiert, ich werde schon klarkommen.)
8. If I am in trouble, I can usually find a solution.
   (Für jedes Problem kann ich eine Lösung finden.)
9. When I am confronted with new situations, I know how to handle it.
   (Wenn eine neue Sache auf mich zukommt, weiß ich, wie ich damit umgehen kann.)
10. When I am confronted with a problem, I can usually find several solutions.
    (Wenn ein Problem auftaucht, kann ich es aus eigener Kraft meistern.)

Scale: 1 = "not true at all" (trifft gar nicht zu) – 5 = "exactly true" (trifft völlig zu)

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10.2   Academic Self-Efficacy

Theoretical Background

Whereas general self-efficacy refers to the optimistic belief in one's own ability to cope with life (Schwarzer/Jerusalem 2002, p. 40), a person may also hold more specific beliefs of self-efficacy regarding various domains of human functioning, e.g., concerning academic achievement or their occupation (ibid., p. 39f.). Academic self-efficacy in particular can be understood as one aspect of the general self-efficacy. It captures the extent to which people (e.g., students or pupils) are confident that they can successfully complete their studies (Mohrenweiser/Pfeiffer 2016, p. 82).

Scales Development

The scale is based on the measurement of academic self-efficacy for students who attend school (Jerusalem/Satow 1999), from which the wording was partly taken. The scale was adopted for students' prospective estimations about their capabilities given different educational pathways.

Items

How likely is it …
(Wie wahrscheinlich ist es Ihrer Meinung nach, …

1. … that you can rely on your abilities during your post-secondary education if you decide to… take up educational training/take up higher education?
(… dass Sie sich auf Ihre Fähigkeiten während des nachschulischen Bildungswegs verlassen könnten, … wenn Sie eine berufliche Ausbildung aufnehmen?/wenn Sie ein Studium aufnehmen?)

2. … that you can successfully cope with difficult tasks during your post-secondary education if you decide to … take up educational training/ take up higher education?
(…dass Sie komplizierte Aufgaben im nachschulischen Bildungsweg gut lösen könnten, … wenn Sie eine berufliche Ausbildung aufnehmen?/wenn Sie ein Studium aufnehmen?)

3. … that you can successfully solve problems yourself, if you decide to … take up educational training/take up higher education?
(…dass Sie Probleme im nachschulischen Bildungsweg aus eigener Kraft meistern könnten, … wenn Sie eine berufliche Ausbildung aufnehmen?/wenn Sie ein Studium aufnehmen?)

4. … that you can still perform well after a long illness if you decide to … take up educational training/take up higher education?
(…dass Sie auch nach einer langen Krankheit noch gute Leistungen im nachschulischen Bildungsweg erzielen könnten, … wenn Sie eine berufliche Ausbildung aufnehmen?/wenn Sie ein Studium aufnehmen?)

Scale: 1 = "very unlikely" (sehr unwahrscheinlich) – 5 = "very likely" (sehr wahrscheinlich)

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11. Subjective Norm

Theoretical Background

Subjective Norms are key variables in the *Theory of Planned Behavior* (Ajzen 1985, 1988, 1991; Ajzen/Madden 1986). Generally, the theory's goal is to explain people's behavior as well as their behavioral intentions. Attitudes toward a behavior, subjective norms, and perceived behavioral control determine an individual's behavioral intentions which in turn leads to certain behaviors (Ajzen 1991). More precisely, subjective norms capture an individual's perception about a certain behavior which is influenced by significant others (Beck/Ajzen 1991, p. 286). The extent to which these significant others can impact on an individual's behavior, however, is determined by the motivation of the individual to meet the expectations (Watermann/Maaz 2010, p. 315).

In order to capture the subjective norm pupils feel confronted with, the aspirations and exception of the pupils' parents related to their post-secondary education were measured in the ZuBAb study, too. Parents' aspirations can be further differentiated into idealistic and realistic educational aspirations as well. Their idealistic aspirations are usually higher than their realistic aspirations (Kurz/Paulus 2006, p. 5495). Furthermore, parents' aspirations usually reflect their own occupational and educational status which leads to a divide following class (and educational) cleavages (ibid.; Ganzach 2000; Kandel/Lesser 1970; Relikowski et al. 2012, p. 112; Sewell et al. 1969, 1970; Stocké 2013).

Scales Development

The measurement reflects what students think that their parents whish and expect them to do regarding higher education. Since the differentiation between idealistic and realistic aspirations proved to be fruitful in educational research, one item reflects the perceived parental idealistic aspiration, whereas one item captures the perceived parental realistic aspiration.

Items

1. Irrespectively of your academic performance: What kind of post-secondary education do you think your parents would want for you?
   (Unabhängig von Ihren schulischen Leistungen: Was glauben Sie, welchen nachschulischen Bildungsweg würden sich Ihre Eltern für Sie wünschen?)
2. Regarding your academic achievements: Which post-secondary education do you think your parents would advise you to choose after school?
   (Vor dem Hintergrund Ihrer schulischen Leistungen: Was glauben Sie, zu welchem nachschulischen Bildungsweg würden Ihnen Ihre Eltern raten?)

Scale: 1 = "University" (eindeutig Studium) – 5 "Vocational education"(eindeutig berufliche Ausbildung)

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12. Subjective Value of Education

Theoretical Background

„The more interesting, useful, and important a sphere of life, the more dedication and time we devote to it" (Kessels/Steinmayr 2013, p. 105, own translation; see also Eccles/Wigfield 1995). All these attributions can be summarized under the label of "subjective value" (Eccles et al. 1983; Steinmayr/Spinath 2010). Subjective value is also attributed to school and related achievement activities (see, for instance, Eccles et al. 1998).

More specifically, subjective value can be differentiated into three minor components: interest value (or: intrinsic value), perceived importance, and perceived future utility (Steinmayr/Spinath 2010, p. 195). The interest value reflects the "inherent enjoyment or pleasure one gets from engaging in an activity" (Eccles/Wigfield 1995, p. 216). Perceived importance is derived from the personal relevance of "performing well" in a particular domain of life (Steinmayr/Spinath 2010, p. 196). Utility values are attributed due to "the value a task acquires because it is instrumental in reaching a variety of long- and short-range goals" (Eccles/Wigfield 1995, p. 216).

Scales Development

The assessment of subjective value attributed to different domains of life goes back to Eccles et al. (1983). Based on earlier works of Eccles and colleagues (Eccles/Wigfield 1995; Wigfield/Eccles 2000), Steinmayr and Spinath (2010) made an important contribution regarding the development of a standardized scale to assess the value of school. The survey program *Selbstwahrnehmung, Motivation, Interesse und Lernmotivation* (SMILE) (Schiefele et al. 2006) also used an instrument for tapping subjective values attributed to school in general. In the ZuBAb study, the instrument from Schiefele and colleagues was combined with the instrument developed by Steinmayr and Spinat. Some items were reformulated.

Items

To what degree do the following statements apply to your motivation in school?
(Wie sehr treffen die folgenden Aussagen zu Ihrer Motivation für die Schule auf Sie zu?)
1. I enjoy school.
    (Schule macht mir Spaß.)
2. It's important to me to do well at school.
    (Mir ist es wichtig, in der Schule gut zu sein.)
3. I feel like school is a waste of time.
    (Ich habe das Gefühl, meine Zeit in der Schule zu verschwenden.)
4. I often postpone homework.
    (Schulaufgaben schiebe ich oft vor mir her.)

<u>Scale</u>: 1 = "not true at all"(trifft gar nicht zu) – 5 = "exactly true" (trifft völlig zu)

References

Eccles, Jacquelynne S./Adler, Terry/Futterman, Robert/Goff, Susan/Kaczala, Caroline/Meece, Judith/Midgley, Carol (1983): Expectancies values and academic behaviors, in: Spencer, Janet T. (eds.): *Achievement and achievement motives*. San Francisco: Freeman, pp. 75-146.

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13. Rational Choice Theory

Summary

Recently, also sociological theoretical models on educational decision making incorporate rational choice arguments (Jæger 2007, p. 451). It is assumed, that students can be perceived as "rational decision makers whose educational choices are aimed at maximizing expected returns to education" (ibid., p. 452). Educational decision making is thus also based on individuals' cost-benefit considerations. The theories, which developed in this field, however, differ regarding the assumptions underlying the individual cost-benefit assessment as well as the different factors influencing an individual's decision-making process.

An important assumption linked to rational choice theories is that the weighing of costs and benefits vary depending on an individual's social background and resource endowment. These different weighing processes explain differences in educational decision making and thus the basis of educational inequality (Becker/Hecken 2007, p. 101). Regarding post-secondary educational decision-making, Esser (1999) developed a rational choice framework building on works of Boudon (1974), Breen and Goldthorpe (1997), and Erikson and Jonsson (1996). The starting point of his theory is the basic decision that individuals who acquire their higher education entrance qualification face. They are confronted with two alternatives: vocational training and university studies. Following Esser, the following factors have an influence on their decision:

- Returns to education: The decision for one of the alternatives has consequences which are captured in the returns to education (U). Returns to education can either be economic (i.e., income), or social (i.e., prestige).
- Each alternative involves direct costs (*-C*).
- Choosig one of the alternatives can lead to a loss of status vis-à-vis an individual's parents
  (*-SV*).
- The probability of experiencing a loss of status is captured with the expected value *c*.
- In order to be able to assess the consequences of choosing an alternative, it is necessary to assess the expected probability for educational success *p* (Becker/Hecken 2007, p. 102).

Formally speaking, the decision-making process can be expressed as follows: "The decision in favour of higher education is made if the expected return to higher education is greater than the return to other educational alternatives", i.e., if the following applies: $EU_{University} > EU_{Vocational\ Training}$. $EU_{University}$ and $EU_{Vocational\ Training}$ can be broken down into (Becker/Hecken 2008, p. 103; Esser 1999):

$$EU_{University} = pU + (1-p)c(-SV)-C$$
$$EU_{Vocational\ Training} = c(-SV)$$

An important assumption linked to rational choice theories is that the weighing of costs and benefits vary depending on an individual's social background and resource endowment. These different weighing processes explain differences in educational decision making and thus the basis of educational inequality (Becker/Hecken 2007, p. 101).

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13.1   Direct Costs

Theoretical Background

Each educational alternative implies certain direct costs. The lower the cost pressure and the safer the study financing appears due to own or parental funds, the more definite the study decision (Becker/Hecken 2007, p. 104). People opting for vocational training in Germany receive remuneration and the costs incurred for training are usually lower. University studies are often associated with high costs. With this in mind, young people from working class and lower middle class backgrounds often opt for vocational training rather than studying (Becker/Hecken 2008, p. 104; Böttcher et al. 1988).

Scales Development

The items to assess the perceived financial burden incurred by vocational training and university studies were adopted from the *Best Up* study. Since rental costs now, however, can make up a significant part of the expenses which need to be considered, they were explicitly included as a cost factor in the text introducing the items.

Items

1. During a vocational training program or higher education, certain things have to be paid for, e.g. travel costs, books, rent, or even fees. Irrespective of your actual educational goals: How difficult would it be for you and your family to cover these costs if you … took up vocational training/embarked on higher education?
(Während einer beruflichen Ausbildung oder eines Studiums müssen verschiedene Dinge bezahlt werden, z.B. Fahrtkosten, Bücher, Miete oder Gebühren. Unabhängig von Ihrem tatsächlichen Bildungswunsch: Wie sehr würde es Sie und Ihre Familie finanziell belasten, diese Kosten zu übernehmen, wenn Sie … eine berufliche Ausbildung machen würden/studieren würden?)

Scale: 1 = "not difficult at all" (gar nicht) – 5 = "very difficult" (sehr)

References

Becker, Rolf/Hecken, Anna E. (2007): Studium oder Berufsausbildung? Eine empirische Überprüfung der Modelle zur Erklärung von Bildungsentscheidungen von Esser sowie von Breen und Goldthorpe, in: Zeitschrift für Soziologie, Vol. 36(2), pp. 100-117.

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13.2   Opportunity Cost

Theoretical Background

Additionally to the direct costs explained above, different educational pathways might entail different amounts of opportunity costs. Given that one alternative is chosen, opportunity costs reflect the loss of benefits that would have be present if other alternatives would have been chosen. Since graduating from higher education usually takes longer than graduating from vocational training, opportunity costs for higher educational arise due to a delayed entrance into the labor market (Breen/Goldthorpe 1997, p. 279).

Scales Development

Since the delayed entrance into the labor market is assumingly the most important factor that rises opportunity costs of higher education, the item developed to measure opportunity costs reflects how much it would burden the respondent and her/his family if labor market entrance was delayed.

Items

1. How much would it burden you and your family financially if it would take you a long time to find a job and to have your own income?
    (Wie sehr würde es Sie und Ihre Familie finanziell belasten, wenn Sie nach dem Schulabschluss lange bräuchten, bis Sie in das Berufsleben einsteigen und eigenes Einkommen haben?)

<u>Scale</u>: 1 = "not at all" (gar nicht) – 5 = "a lot" (sehr)

References

Breen, Richard/Goldthorpe, John H. (1997): Explaining Educational Differentials. Towards A Formal Rational Action Theory, in: *Rationality and Society*, Vol. 9(3), pp. 275-305.

13.3 Utility Expectation

Theoretical Background

Regarding the rational choice theory described above (see p. 2433) the evaluation of each alternative (educational pathway) includes the expected utility (e.g., Boudon 1974), whereby the utility includes economic as well as social, and idealistic returns. According to Esser (1996) on the one hand, the expected utility are determined by the societal value of goods (like education) and on the other hand persons attribute a certain educational pathway differently.

Scales Development

Also the assessment of the material returns to different post-secondary educational pathways was adopted from the *Best Up* study. However, the ZuBAb study did not differentiate between the expected net income after completing a bachelor's and a master's degree as in the case of the *Best Up* study.

In the ZuBAb study, returns to different educational alternatives regarding future career opportunities were assessed on four different dimensions (probability of getting a well-paid job/a prestigious position/an interesting job/a job associated with job security). Items from these four dimensions can be found in the NEPS (SC4), three of them are included in the *Best Up* study, too. The items were adopted from these two studies with slight modification regarding the introduction question as well as the formulation of some items.

Items

Expectation of the future net income:
   1. Imagine you're completing your university degree. What do you expect to be your monthly net income to the age of 35?
      (Stellen Sie sich vor, Sie schließen ein Hochschulstudium ab. Was erwarten Sie, wie hoch Ihr monatliches Nettoeinkommen im Alter von 35 Jahren wäre?)
   2. Imagine you're completing vocational training. What do you expect to be your monthly net income to be at the age of 35?
      (Stellen Sie sich vor, Sie schließen eine berufliche Ausbildung ab. Was erwarten Sie, wie hoch Ihr monatliches Nettoeinkommen im Alter von 35 Jahren wäre?)

Scale: Open-ended question

Expectation of the future career prospects:
The following question deal with how you see your future career prospects.
(Hier geht es darum, wie Sie Ihre beruflichen Aussichten einschätzen.)

1. How favorably would you judge your prospects of getting a well-paid job if … you obtained a vocational training qualification/completed a higher education program?
    (Was glauben Sie, wie gut wären Ihre Aussichten, …später einen gut bezahlten Job zu bekommen, wenn Sie eine berufliche Ausbildung/ein Studium aufnehmen?)

2. And how good would be the prospects of getting a socially prestigious job if … you obtained a vocational training qualification/completed a higher education program?
    (Was glauben Sie, wie gut wären Ihre Aussichten … später einen in der Gesellschaft angesehenen Job zu bekommen, wenn Sie eine berufliche Ausbildung/ein Studium aufnehmen?)

3. How favorable would you judge your prospects of getting an interesting job if … you obtained a vocational training qualification/completed a higher education program?
    (Was glauben Sie, wie gut wären Ihre Aussichten, … später einen interessanten Job zu bekommen, wenn Sie eine berufliche Ausbildung/ein Studium aufnehmen?)

Scale: 1 = "very poor" (sehr schlecht) – 5 = "very good" (sehr gut)

Expectation of the future unemployment risk:

1. What would be the risk of becoming unemployed if … you obtained a vocational training qualification/completed a higher education program?
    (Wie hoch wäre für Sie das Risiko arbeitslos zu werden, … wenn Sie einen beruflichen Ausbildungsabschluss machen würden?/wenn Sie einen Studienabschluss machen würden?

Scale: 1 = "very low" (sehr gering) – 5 = "very high" (sehr hoch)

References

Becker, Rolf/Hecken, Anne E. (2007): Studium oder Berufsausbildung?, in: *Zeitschrift für Soziologie*, Vol. 36(2), pp. 100-117

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13.4   Expectation of educational success

Theoretical Background

The expectation of educational success is one of the major components that rational choice theory assumes to be crucial for educational decision-making (Erikson/Jonsson, 1996; Esser 1999; see above). Researchers suppose that the expectation of educational success leads, in interaction with the estimates of the costs and the benefits, to a decision regarding post-school pathways. Some rational choice theorists assume that the expectation of success varies between social classes, even after controlling for social differences in academic performance (Erikson/Jonsson, 1996). One reason for social differentials net of academic performance might be that socially disadvantaged students think that you have to be very smart for university graduation, whereas socially privileged students might know that the successful completion of university does not require extraordinary academic skills (ibid.).

Scales Development

To measure the respondents' expectations of educational success, the instruments used in the Best Up study and NEPS (SC4) were adopted. However, the text introducing the item was extended.

Items

These questions are about how you would rate your own abilities regardless of your actual plans for the future.
(Unabhängig von Ihren tatsächlichen Zukunftsplänen geht es hier darum, was Sie sich zutrauen würden: Wie wahrscheinlich ist es Ihrer Meinung nach, dass Sie nach Beendigung der Schulzeit …)

1. How likely is it in your opinion that you could successfully complete … vocational training/higher education?
   (… eine berufliche Ausbildung schaffen könnten/ein Studium schaffen könnten?)

<u>Scale</u>: 1 = "very unlikely" (sehr unwahrscheinlich) – 5 = "very likely" (sehr wahrscheinlich)

References

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13.5 Status Preservation

Theoretical Background

Social status preservation in the succession of generations is considered to be an important influencing factor on educational decision-making (Becker/Hecken 2008, p. 103). It is assumed that the parents' social status is perceived as reference point in the social hierarchy. Status preservation, loss of status or status enhancement due to (sub-)optimal educational decisions are assessed relative to this position (ibid.; Esser 1999). Therefore, pupils and students from different social background view different positions as "sufficient" (Müller/Pollak 2005; van den Werfhorst/Andersen 2005).

Scales Development

The assessment of a respondent's perceived relevance of status preservation or status enhancement relative to his or her parents is based on an instrument already used in the NEPS (SC4). While the relevance of status preservation and status enhancement was not separated in the NEPS, a differentiation was introduced in the ZuBAb study. The relevance of these two motives was assessed separately.

Furthermore, the relevance of status preservation and status enhancement was measured with a focus on earnings. This was done since a pretest revealed that it is very difficult for students to answer questions about the general quality of a job without further differentiation.

In order to model the importance of status preservation or status enhancement as a characteristic that drives educational decisions more fully than in previous investigations, the estimated relevance of post-school educational decisions for status preservation and status enhancement was also measured. This was done by the questions whether respondents anticipate preservation or enhancement in regard to the expected earnings depending on post-school educational decisions.

Items

Status preservation/Status enhancement probability after vocational training/higher education

1. Regardless of your actual educational aspirations, what would you expect to earn in your later working life compared to your parents if you obtained a vocational training qualification? … Compared to your mother/compared to your father.

   (Unabhängig von Ihrem tatsächlichen Bildungswunsch: Welches Einkommen würden Sie im Vergleich zu Ihren Eltern in Ihrem späteren Berufsleben nach Abschluss einer beruflichen Ausbildung voraussichtlich erzielen? … Im Vergleich zu Ihrer Mutter/Im Vergleich zu Ihrem Vater)

2. Regardless of your actual educational aspirations, what would you expect to earn in your later working life compared to your parents if you completed a higher education program? … Compared to your mother/compared to your father.

   (Unabhängig von Ihrem tatsächlichen Bildungswunsch: Welches Einkommen würden Sie im Vergleich zu Ihren Eltern in Ihrem späteren Berufsleben nach Abschluss eines Studiums voraussichtlich erzielen? … Im Vergleich zu Ihrer Mutter/Im Vergleich zu Ihrem Vater)

Scale: 1 = "a much lower income" (deutlich niedrigeres Einkommen) – 5 = "a much higher income" (deutlich höheres Einkommen); 6 = "s/he has never been employed" (Sie/Er war noch nie berufstätig.)

Importance of status preservation/status enhancement

1. If you think of your parent's income: How important is it for you to earn an income one day that is as high as the income of … your mother/your father?

   (Wenn Sie an das Einkommen Ihrer Eltern denken: Wie wichtig ist es Ihnen, in Ihrem späteren Berufsleben ein mindestens gleich hohes Einkommen zu erzielen … wie Ihre Mutter?/wie Ihr Vater?)

2. If you think of your parent's income: How important is it for you to earn an income one day that is higher than the income of … your mother/your father?

   (Wenn Sie an das Einkommen Ihrer Eltern denken: Wie wichtig ist es Ihnen, in Ihrem späteren Berufsleben ein höheres Einkommen zu erzielen … wie Ihre Mutter?/wie Ihr Vater?)

Scale: 1 = "not at all important" (sehr unwichtig) – 5 = "very important" (sehr wichtig); 6 = "s/he has never been employed" (Sie/Er war noch nie berufstätig.)

References

Becker, Rolf/Hecken, Anna Etta (2008): Warum werden Arbeiterkinder vom Studium an Universitäten abgelenkt? Eine empirische Überprüfung der „Ablenkungsthese" von Müller und Pollak (2007) und ihrer Erweiterung durch Hillmert und Jacob (2003), in: *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, Vol. 60(1), pp. 3-29.

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