Educational and Career Trajectories of the Russian Youth in a Longitudinal Perspective: A Case of University Graduates

V.A. Maltseva, N.Ya. Rozenfeld

The article was submitted to the Editorial Board in July 2022

Vera A. Maltseva — PhD (Candidate of Sciences in Economics), Associate Professor, Research Fellow, Center for Skills Development and Vocational Education, Institute of Education, National Research University Higher School of Economics. Address: 20 Myasnitskaya Str., 101000 Moscow, Russian Federation. E-mail: vamaltseva@hse.ru (corresponding author)
Natalia Ya. Rozenfeld — Research Assistant, Center for Skills Development and Vocational Education, Institute of Education, National Research University Higher School of Economics. E-mail: nrozenfeld@hse.ru

Abstract

Education and labor market outcomes of the Russian graduates are vastly studied, including their employment status, salaries, types of universities and majors they study. However, there is a lack of research of the graduates' typical paths in education and labor market, whether they fit the conventional trajectory high school — university — permanent employment. Another question is how social background and human capital differentiate trajectories and predict a path, which graduate opts to. In this article, we address both questions. Employing the longitudinal panel study "Trajectories in Education and Careers" we examine the nine-year trajectories of those who earned a university diploma by the age of 25. In our research, we use sequence analysis to identify trajectories and regression analysis to estimate the probability to follow each trajectory depending on individual characteristics — socio-economic status and human capital — while controlling for demographic variables.

We identify nine typical trajectories, including several types of a linear path, various career-oriented trajectories, a reverse and a delayed path, unstable and nontraditional trajectories. This set of education-career paths largely corresponds to foreign studies, but the Russian graduates' trajectories turn out to be smoother. At the same time, individual factors of human capital and socio-economic status moderate education-career paths. The probability of following trajectories with prolonged education (with a post-bachelor's degree) is significantly higher for high achieving students. Entering early career trajectories is associated with a non–cognitive skill — openness to experience. Socio-economic status differentiates two early career trajectories: "accelerated adulthood" for those with low SES and "encouraged professionalization", which is associated with high SES. Following an unstable trajectory is not associated with either socio-economic status or academic performance (cognitive skills) but is associated with low awareness about the field of study when entering a university (ill-informed choice).

Keywords

higher education, labor market, educational trajectory, career path, socio-economic status, human capital, inequality, sequence analysis.

For citing Maltseva V.A., Rozenfeld N.Ya. (2022) Traektorii rossiyskoy molodyozhi v obrazovanii i professii na materiale longityuda: slozhnye marshruty vypusknikov vuzov [Educational and Career Trajectories of the Russian Youth in a Longitudinal Perspective: A Case of University Graduates]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 3, pp. 99–148. https://doi.org/10.17323/1814-9545-2022-3-99-148

"School — university — job", at first glance, this is how the trajectory of any university graduate exactly looks. However, in today's reality, youth trajectories in many developed countries are becoming less predictable and linear [Walther, Plug, 2006; Furlong, 2016]. Students start working well ahead the graduation, the training itself becomes more and more protracted with returns to the education system from the labor market, and the transition to permanent employment is often preceded by a series of temporary jobs. It becomes clear that the educational and career trajectory is not a one-time transition from the "student" state to the "employee" status, but a path with many stops and intermediate states. It is necessary to study such trajectories in all their complexity without limitation to a single school-to-work transition [Duta, Wielgoszewska, Iannelli, 2021].

Economic and sociological empirical studies show that the way the educational and early career trajectories are formed affects the further stages of life, in particular, labor market outcomes — wages, employment sustainability, professional status [Walpole, 2003; Arpino, Gumà, Julià, 2018; Duta, Wielgoszewska, Iannelli, 2021]. The nature of these trajectories, in its turn, is determined by the composition of individual and institutional factors, and especially by the starting conditions as socioeconomic status (SES), academic performance, demographic characteristics [Brzinsky-Fay, 2007; Monaghan, 2020; Lorentzen et al., 2019; Plug, Du Bois-Reymond, 2006]. Data from many countries indicate that a low SES is a strong predictor of a relatively less successful educational and career trajectory [Walpole, 2003], and human capital accumulation is associated with higher labor market outcomes [Nilsson, 2019].

Traditionally, regression analysis and event history analysis are used to study trajectories as well as educational and career transitions, this approach successfully models single transitions or the result of a trajectory, but does not allow to study the structure of trajectories and their patterns. With the growing popularity of longitudinal data, the method of sequence analysis, supplemented by regression analysis, has entered the practice of studying educational and career trajectories. This combination of methods enables to inductively identify trajectories and then evaluate the chances of different groups of respondents to be included in each of them. Many international studies have been carried out through this methodology [Quintini, Manfredi, 2009; Boylan, 2020], however, there are

few papers that separately study the trajectories of university graduates [Wielgoszewska, 2018; Duta, Wielgoszewska, Iannelli, 2021]. Despite the apparent homogeneity of the group of highly educated young people, there is a distinct differentiation of educational and career routes according to socioeconomic status [Duta, Wielgoszewska, Iannelli, 2021].

We know a lot about Russian university graduates, but most empirical studies consider a one-time school-to-work transition, and they are based on sample surveys (for example, [Rudakov, Roshchin, 2019; Dudyrev, Romanova, Travkin, 2020]). Studies of trajectories and their patterns using sequence analysis require long data as longitudinal studies or the collection of administrative information. In the future, continuous monitoring of the employment of graduates of the Ministry of Labor and the Ministry of Education and Science of Russia will create a solid basis for such studies based on statistical data. Among Russian longitudinal studies, the national cohort panel study "Trajectories in Education and Profession" [1] is most suitable for this purpose.

Using the data from nine waves (2012–2020) of the "Trajectories in Education and Profession" longitudinal study, we traced the trajectories of ninth graders who received higher education by the age of 24–25. The purpose of the study is to typologize the educational and early career trajectories of highly educated young people, to determine individual factors predicting inclusion into a particular trajectory. The analytical framework is based on the synthesis of the sociological approach to the study of trajectories and the corresponding methodology with the achievements of economists in the issue of the school-to-work transition. This work is a continuation of the analytical study [Maltseva, Rosenfeld, 2022], which presents a cross-section on the trajectories of university graduates and formulates the main hypotheses on possible factors of the trajectory formation[2]. In this paper, we go further and answer two questions:

1) what are the educational and professional routes of Russian higher school graduates by the age of 25;
2) how are the trajectory starting conditions as socioeconomic status and parameters of human capital (cognitive and non-cognitive skills) related to how the trajectory unfolds in education and profession?

Our research sheds light on the variety and structure of trajectories of highly educated youth in Russia, and also helps to as-

[1] http://trec.hse.ru/

[2] Based on this analytical study, the authors published a column in "RBC Trends": Maltseva V., Rozenfeld N. "The "School → University → Job" path is no longer relevant": https://trends.rbc.ru/trends/education/62d0227e9a794710912218a5

sess the "trace" of starting conditions in the route of a young person in education and in the labor market. Its results may be useful to those who make decisions in the field of educational policy and youth employment, and are of interest to a wide range of readers in the university community, graduates and students themselves.

1. Theoretical Framework for the Study on Educational and Career Trajectories

1.1. Sociological Perspective

Educational and career trajectories are widely studied in labor economics and sociology of education. Sociologists study trajectories and transitions between study and work within the framework of the life course approach [Elder, Johnson, Crosnoe, 2003] and rely on the theories of socioeconomic inequality. In this logic, a person's life is a process of transition between statuses and states, including education and employment, while the change of states does not happen by chance, but is linked to previous transitions and the institutional context in which the trajectory is built. Social reproduction theories [Bourdieu, 1986; Boudon, 1974; Coleman, 1988] and rational choice theory [Breen, Goldthorpe, 1997] help to understand the mechanisms that affect the trajectory and transitions between statuses. They most often compile the theoretical framework for the study of trajectories based on longitudinal data, since they allow to set the role of socioeconomic status in how a person's path develops in education and in the labor market [Boylan, 2020; Duta, Wielgoszewska, Iannelli, 2021].

Social reproduction theories explain the influence of the economic, cultural and social capital of the family on the educational and professional trajectory of the individual, as well as the role of the education system and the structure of the labor market in maintaining the existing social stratification. Empirical studies conducted in different countries reveal that the socioeconomic status moderates educational and career paths [Boylan, 2020] and its influence can be traced throughout a person's life path [Alexander, Entwistle, Olson, 2014; Braun, 2018]. In most OECD countries, children of parents with a low level of education are less than 50% likely to have upward social mobility and higher educational attainment than their parents [Braun, 2018].

Socioeconomic status has primary and secondary effects [Boudon, 1974; Lucas, 2001], directly and indirectly influencing educational and career decisions [Walpole, 2003, Bonnard, 2020]. Firstly, family resources affect academic performance. The education of parents explains a significant part of the variation in children's cognitive skills [Braun, 2018]. As a result, high academic performance allows to choose more privileged educational trajectories. Secondly, a high socioeconomic status is associated with ambitious educational expectations of parents and schoolchildren themselves [McCarron, Inkelas, 2006; Garg et al., 2002]. Social origin is also considered

through the prism of culture, socially formed and collectively supported patterns of thinking and behavior, which can act as a barrier for social mobility and the selection of certain educational and professional routes [Kurakin, 2020].

Rational choice theory, which focuses on the specifics of assessing benefits and costs, also predicts the inclusion of children from more resourceful families in prolonged educational trajectories, their achievement of high qualifications and the corresponding professional status. Through implementing a strategy of avoiding the risk of downward social mobility, the holders of a high SES strive to get an education that is not lower than that of their parents, while those from families with a relatively low SES opt for more "safe" and less costly educational routes [Werfhorst van de, Hofstede, 2007; Breen, van de Werfhorst, Jæger, 2014]. These theoretical propositions have been repeatedly empirically confirmed, including studies of the educational trajectories of young people [Yastrebov, Kosyakova, Kurakin, 2018; Boylan, 2020].

The socioeconomic status also affects the professional trajectory, although this relationship is somewhat weaker for university graduates than for population groups without higher education [Torche, 2011]. Nevertheless, there is a gaping social inequality among highly educated young people [Jacob, Klein, Iannelli, 2015; Klein, 2021]: people from less resourceful families find themselves in less stable and smooth career trajectories than their peers from more prosperous families [Duta, Wielgoszewska, Iannelli, 2021]. These results are based on data from longitudinal studies that enable to assess not only the actual position on the labor market as well as professional status, but also the trajectory pattern.

Thus, it is empirically confirmed that the initial advantage — a high socioeconomic status — leads to a multiplication of rewards throughout life. The initial conditions of life, including socioconomic status and health, have a domino effect in the life trajectory due to both primary and secondary effects [Arpino, Gumà, Julià, 2018]. As a result, social origin becomes a cumulative accumulated advantage [Merton, 1968], through which inequality is reinforced [DiPrete, Eirich, 2006; Mayer, 2009]. In our study of university graduates — a relatively homogeneous group from the point of SES perspective — we expect to show how social status differentiates the trajectories of highly educated youth.

1.2. Economic Perspective

In contrast to sociologists, who tend to focus more on the process and context of an individual's life path, economists examine educational and career trajectories from the perspective of their outcomes, such as the accumulation of human capital and returns on investment. The traditional framework for such studies is the hu-

man capital theory [Becker, 1962; Schultz, 1961; Mincer, 1974] and the signaling theory [Spence, 1973]. Both predict that labor market outcomes, i.e. earnings, will be higher for those who have studied longer and have a longer work experience. However, proponents of the human capital theory believe that the success of a better-educated and experienced individual in the labor market is mediated by personal greater productivity acquired through investments in human capital, whereas the signaling theory does not associate actual labor productivity with the duration of education. Here, a diploma serves only as a signal of an worker's initial level of productivity in conditions of information asymmetry on the labor market.

Empirical studies show that obtaining a higher level of education is associated with educational success and the level of available cognitive skills [Hanushek et al., 2015], i.e. with previous conditions and investments in human development. In turn, the higher the level of education, the better (more productive) the workplace and the higher the earnings. University graduates in different countries of the world receive higher wages and have more stable jobs than people with a high school or college diploma [Psacharopoulos, Patrinos, 2018]. This is also true for levels within higher education: masters earn on average more than bachelors, but with significant differentiation by specialty [Altonji, Blom, Meghir, 2012; Altonji, Zhong, 2021]. At the same time, the demand for masters is growing, but it is not only related to technological progress in the economy, which requires increasingly high qualifications [Autor, 2014]. In the context of the massification of higher education and a decline in the signaling function of a university diploma [Brown, Souto-Otero, 2020], upskilling occurs — an increase in the requirements for formal qualifications, which fits well into the credential theory of R. Collins [Collins, 1979]. In particular, in the labor market of many developed countries, there are more and more vacancies that provide for a master's degree [Modestino, Shoag, Balance 2020]. Thus, it can be expected that the trajectories with a master's degree will be privileged routes with selection by cognitive skills and the SES level.

In addition to obtaining a high level of education, the most important investment in human capital is the acquisition of work experience. In many countries, a combination of university studies with work has long been a mass practice [Beerkens, Mägi, Lill, 2011] and has turned into a strategy to increase the chances of employment after graduation [Tan, Lim, Loke, 2020; Maltseva, 2021]. At the same time, there is no unambiguous connection between combining study with work and academic performance [Neyt et al., 2019]. In general, the work experience gained during student years has a non-zero return [Baert et al., 2017]. In Russia, the combination gives a significant bonus to the graduate's starting salary, especially if he worked in the specialty as a student [Dudyrev, Romanova,

Travkin, 2020]. In this case, the student accumulates not only general human capital, but also specific work experience, which is encouraged on the labor market and acts as a strong signal for employers. The motives for combining study with work vary across countries and are related to the institutional context. Thus, financial motives prevail in developed countries, where a diploma of education has not lost its signaling function, whereas in transition economies, including Russia, students begin to combine both for material reasons and in an effort to gain work experience [Dudyrev, Romanova, Travkin, 2020]. Therefore, it can be assumed that a low SES and/or low academic performance will not successfully predict the trajectory of long-term work experience among Russian graduates.

Besides the cognitive skills acquired in formal education, non-cognitive or personal characteristics are also referred to as total human capital; economists consider such characteristics as skills, i.e. trainable skills [Kautz et al., 2014]. Studies show that non-cognitive characteristics are associated with labor market outcomes and their impact is comparable to the impact of cognitive skills [Heckman, Stixrud, Urzua, 2006; Brunello, Schlotter, 2011]. Thus, openness to experience [Rozhkova, 2019], conscientiousness [Collischon, 2020] are positively associated with the wage rate and the probability of employment, while neuroticism reduces the chances of employment [Rozhkova, Roshchin, 2021; Collischon, 2020]. Despite the elaboration of the topic of non-cognitive skills and their connection with educational and career success, these characteristics, unlike cognitive skills, are rarely taken into account in studies of educational and career trajectories based on longitudinal data. However, based on previous work on Russian data [Rozhkova, 2019], it can be hypothesized that there is a significant relationship between openness and conscientiousness with inclusion in more successful employment trajectories, and for recent graduates — in trajectories with early entry into the labor market.

Economists who assess the return on experience, education and skills, and sociologists who study inequality in education and occupation, are effectively dealing with the same material, but they traditionally have limited interactions and collaborate little in joint research efforts[3]. Nevertheless, economists are not unfamiliar with the idea of the non-randomness of an individual's educational and career path: they study the relationship between these trajectories

[3] An example of such a combination of efforts is the Center for the Economics of Human Development at the University of Chicago, headed by D. Heckman, a Nobel laureate in economics and one of the leaders in the field of human development research in the social sciences. It implements a synthesis of approaches, bringing together not only economists and sociologists, but also psychologists and geneticists. See more: The Center for the Economics of Human Development, the University of Chicago: https://cehd.uchicago.edu/

and previous investments in the individual, particularly in early development [Heckman, Pinto, Savelyev, 2013]. As a result, the economists' approach to trajectories also allows us to build chains of interrelated events in line with the theory of cumulative advantage — in this case, from the perspective of investments in human capital.

In this study, we attempt to integrate both disciplinary approaches. The theoretical framework is based on a sociological interpretation of the trajectory within the concept of the life course, however, both sociological and economic categories and empirical findings are integrated into the system of factors explaining inclusion in a particular education and work trajectory. This approach allows for a comprehensive understanding of the educational and career trajectories of highly educated youth and the factors explaining their diversity.

2. Review of Educational and Career Trajectories Research

2.1. Modern Methods of Trajectory Research

Educational and career trajectories are increasingly being considered by researchers as routes where the patterns of state transitions are important, and not just individual transitions. With the shift in paradigm, the methodology of research has also changed. The traditional study of transitions, such as the school-to-work transition, is built on deductive statistical methods, such as regression analysis or event history analysis [DesJardins, Ahlburg, McCall, 2002; DesJardins, McCall, 2010; Goldrick-Rab, 2006]. However, these methods are not suitable for trajectory analysis as they do not allow for their heterogeneity and diversity of patterns. Inductive approaches are actively used for the study of long trajectories and multiple transitions between statuses. These include latent trajectory analysis methods [Bahr, 2010; Crosta, 2014; Marti, 2008] and sequence analysis, or sequential analysis [Abbott, Tsay, 2000]. The essence of the latter is to classify scenarios for changing the state or characteristics of an object over time. With respect to educational and career trajectories, the analysis is focused on the sequence of state (status) transitions in education and on the labor market.

From a life course perspective, sequence analysis is best suited for studying trajectories as it considers professional path not as a set of individual points (statuses), but as a sequence of transitions, a process of moving between statuses [Duta, Wielgoszewska, Iannelli, 2021]. Sequence analysis is most often the first step in trajectory research, followed by regression analysis, which allows for modeling the inclusion of respondents in the trajectories identified at the first step. This combination of inductive and deductive approaches has become the gold standard in studies of educational and career trajectories [Anyadike-Danes, McVicar, 2005; Brzinsky-Fay, 2007; Quintini, Manfredi, 2009; Scherer, 2001; Ranasinghe et al., 2019; Lorentzen et al., 2019; Monaghan, 2020].

2.2. Typology of Trajectories

Traditionally, the trajectories of university graduates have been evaluated in terms of their linearity. A linear trajectory is considered one with a smooth transition: a graduate effortlessly moves into permanent employment after completing university education [Plug, Du Bois-Reymond, 2006]. A distinctive feature of the linear trajectory is predictability, the absence of any difficulties with entering the labor market, such as a series of temporary jobs or periods of unemployment. "Alternative" routes refer to other trajectories, including prolonged temporary employment, frequent job changes, and unemployment. As a result, a dichotomous classification of trajectories has been established: linear and nonlinear [Ellen, van der Velden, 2007].

However, this dichotomy does not reflect the full complexity of the career paths of highly educated youth. In our study, we consider an additional spectrum of trajectories identified in a comparison study of the employment outcomes of Finnish and Portuguese university graduates [Alves, Korhonen, 2016]. Among the "alternative" or non-linear trajectories, the authors identified two separate paths: unstable or precarious, and deferred. A university graduate is considered to be on an unstable trajectory if they enter temporary work or have another non-standard employment after completing their education. There may be breaks in employment in an unstable trajectory The deferred trajectory implies a delay in entering the labor market after obtaining higher education, either due to continued education or problems with finding a job.

In addition to these trajectories, it is worth highlighting an unconventional transit route that vocational graduates follow, making a progression to higher education [Yastrebov, Kosyakova, Kurakin, 2018]. Since the focus of our research is not a one-time transition from school to work, but the entire period of formal education and work until the respondent reaches the age of 25, we additionally distinguish trajectories with early entry into the labor market, which occurred while the respondent was still studying at the university. These trajectories are identified as career-oriented. As a result, the typology of trajectories used by us covers the full range of diverse educational and early career routes of graduates.

2.3. Empirical Studies of Trajectories

Studies of educational and career routes in various countries indicate that the majority of university graduates enter the labor market along non-linear trajectories [Kivinen, Nurmi, 2003; Lindberg, 2009]. At the same time, university graduates tend to have smoother routes compared to those of vocational graduates [Du Bois-Reymond, Blasco, 2003; Machin, McNally, 2007]. Recently, there has been an increase in popularity of trajectories involving returning to the education system after entering the labor market [Al-

ves, Korhonen, 2016], primarily among university graduates who return to university in order to achieve a higher level of education.

However, educational and career paths differ significantly differ across countries depending on the type of institutional regime (transition regime) [Walther, 2006], i.e. the configuration of institutional conditions in the labor market and in the education system. In particular, the institutional regime in post-socialist countries has its own characteristics [Noelke, Gebel, Kogan, 2012]. For example, in Russia, after graduation from a university, finding a job is relatively fast: 80% of graduates are employed no later than a year after graduation[4]. As in other countries, in Russia the practice of combining study with work is widespread: 25% of students constantly worked while studying [Lopatina et al., 2020], over 60% worked from time to time starting from the 3rd year [Roshchin, Rudakov, 2016], in the master's program more than 80% combined study and work [Emelina et al., 2022]. At the same time, combining work and study provides a salary increase of 30% [Rudakov, Roshchin, 2019; Dudyrev, Romanova, Travkin, 2020].

The topic of the school-to-work transition among graduates of Russian universities is well developed, however, long trajectories and their patterns have not yet become the object of research, primarily due to difficulties in obtaining the necessary data. To study long trajectories using inductive statistical methods, such as sequence analysis, longitudinal data is required, ideally on a nationally representative sample. In this paper, we attempt to fill this gap by conducting research on longitudinal data and a nationally representative sample of Russian schoolchildren.

The cohort of Russian youth under study consists of individuals who were 24–25 years old in 2020. Due to the conditions prevailing during the formation of their educational and career trajectories, this cohort is of particular interest. The transition to a two-tier higher education system within the framework of Russia's accession to the Bologna Process took place in the mid-2000s, however, the first mass graduation of master's degree recipients took place in 2017 [Rozhkova et al., 2021]. As a result, the cohort we are studying received higher education in the well-established "bachelor's — master's degree" system and in the context of the signaling function of a master's degree in the labor market [Ibid.]. On the other hand, since the mid-2010s, against the background of decreasing economic and territorial accessibility of higher education [Malinovsky, Shibanova, 2020], there has been an increase in demand among youth for the "Ninth grade — vocational education" track, and in 20% of cases it turns into the "Ninth grade — vocational school — universi-

[4] Monitoring data on the employment of graduates 2018-2020. Rosstat, 2022: https://rosstat.gov.ru/labour_force

ty" transit track [Maltseva, Shabalin, 2021]. Therefore, in the cohort of 25-year-old university graduates under consideration, there are both participants who received higher education within the traditional "academic" "11 school grades — university" track and those who chose to transit to higher education through vocational school.

Another characteristic of the cohort under study is its relative smallness in Russia: according to Rosstat, the survey respondents were born during a demographic downturn, in 2021 the cohort of 15–29-year-olds made up 15.5% of the Russian population, in 2012 it was 22.1%. A small number can create a "demographic bonus" for university graduates, contributing to a smoother entry into the labor market. On the other hand, the entry into the labor market from the magistracy for many in the studied cohort came at the beginning of the pandemic in 2020, which may have hindered the transition, especially for those who did not combine study and work [Maltseva, Rosenfeld, 2022]. The crisis associated with the outbreak of the pandemic had a negative impact on the number of starting vacancies for graduates[5], as well as the pace of transition from temporary to permanent employment and chances to gain a foothold in the workplace. The combination of these conditions and cohort characteristics creates a context that determines the specifics of the trajectories in education and in the labor market, it is important to consider when comparing the data obtained with the results of foreign studies.

3. Data and Methods

The empirical base of the research is comprised of data from the National Cohort Panel Study "Trajectories in Education and Careers"[6] (TrEC), a longitudinal study, which has been conducted annually in Russia by the HSE Institute of Education since 2009. The TrEC includes a national representative panel and several regional panels. The initial sample of the national panel consists of the 8th graders (age — 13–14 years), who participated in the 2011 International Mathematics and Science Study (TIMSS) and the 2012 Program for International Student Assessment (PISA), and have been surveyed annually since then.

The TrEC design is aimed at capturing the process of forming educational and career trajectories of young people and is based on similar international studies, such as the Swiss TREE, the Canadian YITS and the Australian LSAY [Malik, 2019]. In total, 4,893 students from 210 schools in 42 regions participated in the zero wave

[5] According to hh.ru, the share of starting vacancies in April — June 2020 ranged from 5.9 to 6.5%, which was the worst indicator in three years. See: How the pandemic affected the labor market of young professionals: https://hh.ru/article/27227

[6] http://trec.hse.ru/

(TIMSS-2011 panel). In 2012 (the first wave), parents of students also took part in the survey. The response rate of respondents in 2012 (the first wave) was 69% of the zero wave, and in 2020 (the ninth wave) it was 76%. 3,743 people participated in the 9th wave, the last one for which data is available.

The empirical strategy is based on previous studies [Brzinsky-Fay, 2014; Brzinsky-Fay, Solga, 2016; Monaghan, 2020] and consists of two stages: determining typical trajectories through sequence analysis and modeling the inclusion in each trajectory based on a set of predictors. The TrEC data allow for tracking the educational and career trajectories of a cohort of ninth graders over a nine-year period from 2012 to 2020. We used data from nine available TrEC waves, as well as zero wave data in TIMSS-2011 and PISA-2012.

At the first stage, typical educational and career trajectories were determined through sequence analysis followed by clustering for those who had higher education by 2020[7] (for more details, see [Maltseva, Rosenfeld, 2022]). Initially, for each respondent, we compiled chains of sequences of annual[8] statuses in education and in the labor market for nine available years, starting with 9th grade education[9]. For this purpose, nine statuses were introduced (Table 1). As a result, the chain of status sequences for a hypothetical respondent was as follows:

A-A-A-C-C-I-I-F-E

where A-I is the respondent's status in the next wave (see the symbols in Table 1).

[7] The sample is limited to those who have received higher education by 2020, i.e. at the age of 24–25. Two categories of potential university graduates are excluded from the sample: students who have not completed or interrupted their studies at the university, as well as college graduates who have entered the university but are still continuing their education as of 2020 (college graduates who have received a university diploma by 2020 are included in the sample). Both categories are of independent interest for research (in particular, the trajectories of college graduates, among whom there may be both those who have been expelled from the university and those who continue to study at the university after college), however, they cannot be included in the current sample of university graduates according to the main differential criterion.

[8] The duration of being in the status is calculated as the number of periods between marks of this status. In our study, due to the structure of the TrEC data, the period is not a month, but a year. Therefore, a respondent who indicated four consecutive waves of university education as their occupation will be credited with three periods of being in that status, not four. As a result, the calculated duration of being in the status is not a calendar period of university education or work, but serves as a conventional parameter for comparison of trajectories. In many studies, a month is used as the period due to the availability of administrative data [Brzinsky-Fay, 2007], but annual surveys are also used, as in TrEC [Ranasinghe et al., 2019].

[9] All stages of sequence analysis were performed in *the TraMineR* package in *RStudio*.

Table 1. **Annual statuses of respondents used in sequence analysis**

Status code	Status	Status Description
A	School Education	Education in secondary school
B	Vocational Education	Education in vocational school without combining with work
C	Higher Education	Education in university without combining with work
D	Temporary Work	Temporary work (no education, irregular work, part-time work, working week less than 30 hours)
E	Permanent Work	Permanent work (no education, working week more than 30 hours, including those on paid leave or child care leave)
F	Inactivity[a]	Not studying, not working, not seeking employment or serving in the military[b]
G	Unemployment	Not studying, not working, but seeking employment
H	Vocational Education with Work	Education in vocational school with combining with work (temporary or permanent)
I	Higher Education with Work	Education in university with combining with work (temporary or permanent)

[a] In accordance with the approach of the ILO and Rosstat, full-time students are considered to be economically inactive, however for the purposes of this research, all students are allocated from the category of inactive.

[b] Respondents who have served in the military are listed as inactive in the corresponding wave.

To analyze the trajectories, we used an original composition of statuses. Firstly, considering the widespread practice of combining study and work among Russian students [Emelina et al, 2022], a separate status of combining was introduced. Usually, when studying trajectories using sequence analysis, the statuses associated with the combination are not used, and education and work are fixed as mutually exclusive statuses [Ranasinghe et al., 2019]. Secondly, we set a goal to capture the trajectories of those who came to higher education from institutions of secondary vocational education. To do this, the statuses of vocational education and combining vocational education with work are allocated.

The sequence analysis was carried out on the data of the entire cohort. During the formation of the chains, a sample was reduced[10]

[10] The problem of sample attrition is typical for longitudinal studies [Gustafsson et al., 2012]. On average, 10% of primary respondents are not represented in subsequent waves [Makurdi, Mroz, Grits, 1998]. Other trajectory studies with

to 2,082 observations, since in order to analyze the sequence, it is necessary that each respondent has a status in each wave. Comparison of the sample with the zero wave (TIMSS-2011) showed certain shifts in the main socio-demographic characteristics, however, less pronounced than, for example, in a study based on Australian longitudinal data [Ranasinghe et al., 2019], where there was a shift in favor of academically successful youth with a high SES by 15–20 percentage points. The proportion of respondents with high educational aspirations increased in our sample, and the gender distribution shifted in favor of females (Appendix 3). The weighting of the sample in accordance with the baseline wave (TIMSS-2011) through the main socio-demographic characteristics did not bring significant improvements, therefore further analysis was based on a sample without weights. Subsequently, a sub-sample of respondents who held a university diploma by the time of the 2020 wave was formed from the resulting sample of 2,082 observations. The final sample for the study of the trajectories of university graduates includes 1,247 observations.

After constructing sequences chains according to the *optimal matching* algorithm, a cost matrix, or a distance matrix, was created. The "cost" in the cost matrix refers to the distance between two chains, i.e. the minimum number of changes required to turn one sequence chain (a set of statuses) into another. To identify trajectories (patterns in sequence chains), this distance matrix was subjected to hierarchical clustering by the Ward method. According to the results of clustering, nine clusters were identified — typical educational and career trajectories for university diploma holders.

At the second stage, regression analysis was performed to evaluate the chances of inclusion in each of the identified trajectories. A multinomial logistic regression was used, where the trajectory (cluster) was treated as a dependent variable. We modeled the probability of inclusion in each trajectory relative to the reference linear trajectory, depending on the starting conditions, i.e. individual indicators of socioeconomic status and human capital (cognitive and non-cognitive skills), while controlling for demographic characteristics.

The achieved level of education and its duration are traditional proxies of human capital. However, in this paper, the level and dura-

sequence analysis are based on samples with significantly greater attrition than ours, for example, in the Australian youth decadal trajectory study, sequence analysis was performed on 22% of the initial sample [Ranasinghe et al., 2019]. Researchers have different approaches to the issue of the impact of sample attrition on the regression model estimation results: some researchers ignore the attrition and study only the available data, others use a set of special statistical procedures for data imputation [Dan et al., 2013; Twisk, de Vente, 2002].

tion of education act as a differentiating characteristic of the trajectory. Since it has been established that cognitive and non-cognitive skills provide tangible returns on wages, i.e. they predict productivity and measure human capital better than the level and duration of education [Heckman, Stixrud, Urzua, 2006; Hanushek et al., 2015], we assess the relationship between the chance to be in a particular trajectory (implicitly taking into account the level and duration of education) and the most important components of human capital — cognitive skills and non-cognitive characteristics.

Based on the theoretical provisions discussed in Sections 2.1 and 2.2, and on the results of previous studies on trajectories and the school-to-work transition (Sections 3.2 and 3.3), the following hypotheses have been formulated.

H.1. Inclusion in long-term higher education trajectories (trajectories with master's degree) is associated with a higher socioeconomic status and human capital (cognitive skills).

H.2. Inclusion in career trajectories, i.e. trajectories with prolonged work experience, as well as combining education and work, is not associated with low socioeconomic status and human capital (cognitive skills).

H.3. Inclusion in trajectories with prolonged periods of labor market instability is associated with relatively low human capital (cognitive and non-cognitive skills).

The following variables were considered as predictors of inclusion in educational and career trajectories in the model[11]. To measure the SES, the following were taken: the cultural capital of the family, the education of parents and the educational expectations of parents. Indicators of human capital were the result of TIMSS in mathematics in the 8th grade[12], winning an award place at the All-Russian Olympiad of Schoolchildren, and non-cognitive characteristics (openness to new experience, conscientiousness, neuroticism), as well as awareness and proactivity in choosing a specialty when entering university. The control variables included gender, the size of the locality where the participant completed secondary school, living with parents during university education, reproductive plans and the profile of the first specialty at the university. The construction of variables used in the study, including non-cognitive characteristics, is described in Appendix 1.

The inclusion of a large number of control variables, especially those with a complex nature of association with social origin

[11] The data were previously checked for multicollinearity.

[12] The TIMSS result in mathematics is taken as a metric of academic abilities (total human capital), since it is more independent of the SES than the Unified State Exam [Prakhov, 2015]. Also in the sample there are college graduates based on 9 grades, who did not pass the Unified State Exam when entering the university.

and human capital parameters, may impose certain limitations on the reliability of the model. However, our strategy of including the aforementioned variables in the control is motivated not only by the desire to reduce the residual variance and eliminate the possible bias in the coefficients of key independent variables (SES and human capital) — this was only partially realized[13]. We sought to include variables in the control that have independent research value and can contribute to the explanation of inclusion in a particular trajectory. In similar exploratory studies with a design consisting of inductive sequence analysis with further deductive regression analysis, the accuracy of coefficient estimation is often sacrificed for the possibility of assessing a larger range of variables in order to reach new hypotheses about the structure of trajectories and inclusion factors in them [Brzinsky-Fay, 2014; Boylan, 2020].

Gender of the participant and size of the locality are traditionally included in studies of educational choice [Bessudnov, Malik, 2016; Bogdanov, Malik, 2020] and educational and career trajectories [Boylan, 2020; Ranasinghe et al., 2019]. Judging by the data of research findings [Mills, Praeg, 2014; Elder, Kring, 2016], the trajectories of women in the labor market are less linear, they are more likely to be in a state of inactivity than men. Also, graduates of Russian universities already have a gender gap in the starting salary: males earn more [Kiryushina, Rudakov, 2021]. The size of the locality allows for differences in educational opportunities and labor market structure: the larger the locality, the more opportunities there are for obtaining a higher level of education [Bogdanov, Malik, 2020] and qualified employment. The inclusion of variables such as living with parents during university education and having children is justified by their connection with early entry into the labor market and early adulthood [Roshchin, 2006]. Therefore, we assume

[13] In the electronic appendix to the paper (Table A, follow:) a comparison of the evaluation of two model specifications is presented: a base model with all control variables (M1) and a model (M2) with "switched off" control variables (during university education, reproductive plans). We "switched off" these variables from the model, assuming their complex relationship with the socioeconomic situation and human capital (cognitive skills). Deferred reproductive plans and living with parents are indicators of the so-called deferred adulthood, which is more characteristic of holders of high SES [Billari, Hiekel, Liefbroer, 2019]. Another manifestation of "deferred adulthood" is prolonged formal education, associated with deferred entry into the labor market, i.e. obtaining a higher level of education, and this, in turn, is associated with higher academic performance and high SES (see Sections 2.1 and 2.2). A comparison of the estimates of two models showed a low bias of the estimated marginal effects for the key variables (SES and human capital) in terms of the coefficient size, while most of the coefficients exceeded the threshold of statistical significance. The evaluation results do not confirm the doubts expressed above regarding the reliability of the model when including control variables with a complex implicit relationship with the key independent variables.

that among the participants in career trajectories there are more people living separately from their parents and young parents or those who plan to become so in the next three years. The inclusion of a specialty in the control variables allows for differences in the expected duration of higher education in different professions (for example, many natural science specialties, including medical ones, assume a longer period of study at the first stage of higher education or imply continuing education).

4. Results

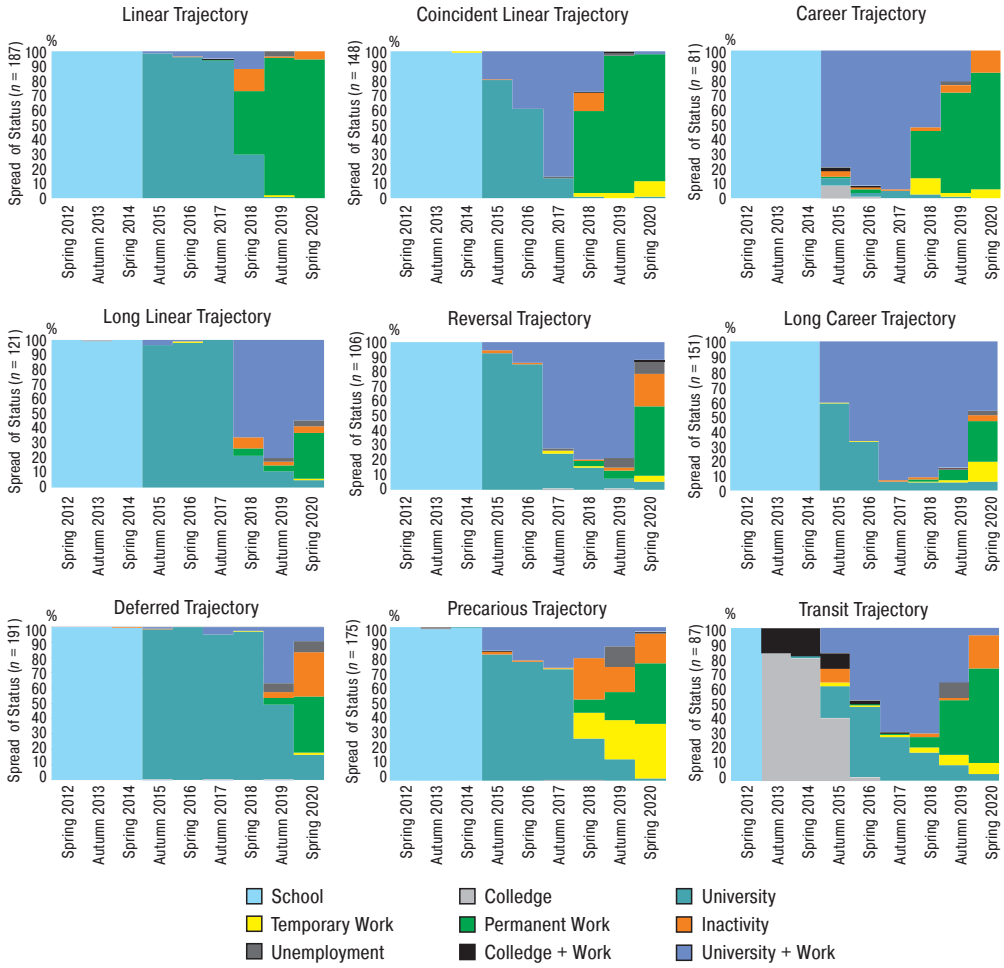
4.1. Nine Trajectories in Education and in the Labor Market by the Age of 25

Results of the research revealed nine characteristic trajectories in education and in the labor market (Figure 1). Their content interpretation and classification is based on the allocation of the traditional linear trajectory, implying the completion of a bachelor's degree or specialty with a smooth transition to permanent employment — without the practice of combining study with work, and without continuing education and returning to the education system. The rest of the routes are more complex, associated with early entry into the labor market in the format of combining study with work, or with continuing education in a master's degree, or with staying in unstable states — temporary employment, inactivity, unemployment. Let us consider the features of each of the nine trajectories, their main descriptive characteristics are presented in Appendix 2.

The *linear trajectory* (15% of the sample participants) is a trajectory that is usually considered as a benchmark, however, in reality it is rather an exception, only 15% of the highly educated youth followed it. In the linear trajectory, young people entered the bachelor's degree after graduating from the 11th grade, devoted themselves only to studying at the university and, after graduating, moved into permanent employment and are successfully in it up to 25 years. Many of them are employed in the public service (21%). Similar to the linear trajectory is the *linear with a combination* (12% of the sample). Its main difference from the linear one is that the participants began to combine their studies with work on senior courses, which is partly due to living in larger cities — and thus wider possibilities for employment. The top three employment sectors for the participants of this track include the highly profitable sphere of IT, marketing and media (19% of the employed). By the age of 25, participants of the linear trajectory with a combination have a labor income 10 percentage points higher than the average of the sample.

The opposite of a linear track is *a career-oriented trajectory* (6% of the sample). Here, the participants also graduated only with a bachelor's degree, but started working as early as the 1st year. This track is where the majority of young parents concentrate: 21% of participants aged 24–25 have children. A significant part of the youth in

Figure 1. **Nine Trajectories of University Graduates: Sequences of Consecutive Status Changes in Education and in the Labor Market**



this track is employed in the least qualified segment — in the service sector (31%).

A separate group consists of four trajectories with long-term higher education, i.e. the participants of these tracks entered the master's program. Among those who have chosen long-term education, there are more those who work in industries that require high qualifications — in industry and education, and fewer of those who are employed in the service sector.

A long linear trajectory (10% of the sample) is followed by those who, after a bachelor's or a specialist degree, entered a master's program and first entered the labor market after completing the second stage of education. Many participants in the trajectory work in industry as well as in education. Graduates who, after receiving a university diploma, entered the labor market and, with-

out stopping working, entered the magistracy, followed a reverse trajectory (9% of the sample). The participants of this track predominantly work in highly profitable areas: industry, IT, marketing and media.

The other two trajectories with long-term education are complete opposites of each other. According to the Monitoring of Graduate Employment [Emelina et al., 2022], more than 80% of masters worked during their studies. We identified the trajectory followed by master's degree students who are an exception to the rule — this is *a deferred trajectory* (15% of the sample). Until the age of 24, the participants of this trajectory had no work experience, did not combine education and work, dedicated themselves to studying, after completing a bachelor's degree or a specialty and then a master's degree, and almost none of them have children. Their entry into the labor market coincided with the pandemic 2020, and there was no smooth transition to permanent employment, and those employed on a permanent basis have a lower than average labor income in the sample. The antipode of the deferred trajectory is *a long career-oriented trajectory* (12% of the sample), or "careerists". The participants of this track started working from the 1st academic year, as in a simple career trajectory, but their work did not prevent them from continuing their studies in the master's program. The sphere of their employment corresponds to a high qualification: 43% work in industry and education.

An *unstable* (14% of the sample) *trajectory* stands out among all the trajectories. Its participants have various educational experience (most have overcome only one stage of higher education, but some have continued their studies in the master's program), but they are united by the specifics of the situation on the labor market. Most of the time after completing their studies, graduates spent in temporary employment and inactivity, and in the pandemic year of 2020, over half of the trajectory participants were in an unstable position. However, the labor income of those who have employment is slightly lower than the average in the sample.

In addition to the traditional routes to higher education after the 11th grade, there is an unconventional one — *transit trajectory* (7% of the sample). Girls predominate (74%) among the participants of this trajectory. Transit students entered the university immediately after graduating from vocational institution on the basis of 9 grades. They combined their studies with work at the senior courses of the university with the subsequent transition to permanent employment. The labor income in this trajectory is 20.6 percentage points lower than the average in the sample, which may be related to later acquisition of higher education and a low level of accumulated human capital compared to those who entered higher education along the traditional route.

4.2. Relationship of the Trajectory with Socioeconomic Status and Human Capital

Let us consider the results of the analysis of the correlation between the starting conditions — socioeconomic status and human capital — and the educational and career trajectory by the age of 25. Table 2 presents the marginal effects for a regression model, estimating the inclusion in each trajectory relative to a linear one.

Table 2. **Probability of inclusion in educational and career trajectories: results of regression analysis (marginal effects; linear trajectory — a base)**

Variable	Type 1. Short-term higher education and work		Type 2. Long-term higher education				Type 3. Non-traditional routes	
	Linear with a combination	Career-oriented	Long career-oriented	Long linear	Deferred	Reversal	Transit	Unstable
Socioeconomic status								
High educational expectations of parents	0.033	0.009	**0.032*** **	0.003	–0.006	0.006	–0.039	0.013
	(0.067)	(0.019)	(0.011)	(0.05)	(0.037)	(0.123)	(0.024)	(0.028)
Higher education of parents (none have — a base)								
One parent with higher education	–0.005	0.003	0.007	–0.047	0.072	–0.044	–0.006	–0.004
	(0.053)	(0.008)	(0.009)	(0.042)	(0.05)	(0.05)	(0.059)	(0.026)
Both parents have higher education	–0.02	–0.016	0.039	–0.006	0.083	0.009	–0.025	–0.04
	(0.059)	(0.013)	(0.024)	(0.081)	(0.052)	(0.068)	(0.026)	(0.032)
High cultural capital of the family	0.044	**–0.042*** **	**0.07*** **	–0.017	–0.013	0.017	–0.011	–0.034
	(0.039)	(0.006)	(0.009)	(0.034)	(0.035)	(0.05)	(0.048)	(0.034)
Human capital (cognitive skills)								
TIMSS score in Math (worst quartile/Q4 — a base)								
Q1	–0.016	–0.013	**–0.069*** **	**0.075*** **	**0.059*** **	**0.094***	**–0.034*** **	–0.083
	(0.049)	(0.009)	(0.01)	(0.023)	(0.019)	(0.054)	(0.013)	(0.056)
Q2	–0.068	**0.016** **	–0.013	0.054	–0.002	0.086	**–0.049** **	–0.034
	(0.078)	(0.008)	(0.012)	(0.05)	(0.071)	(0.067)	(0.021)	(0.028)
Q3	–0.033	0.007	–0.003	0.062	0.003	0.039	–0.017	–0.043
	(0.048)	(0.013)	(0.021)	(0.038)	(0.038)	(0.053)	(0.024)	(0.05)
Prize-winner of the All-Russian Olympiad of Schoolchildren	–0.017	**–0.039** **	**0.03*** **	0.03	0.039	–0.015	–0.045	0.024
	(0.094)	(0.015)	(0.011)	(0.042)	(0.058)	(0.125)	(0.03)	(0.04)
Human capital (non-cognitive characteristics)								
Closeness	0.002	**–0.022** **	**–0.018** **	0.015	0.036	–0.01	0.007	–0.003
	(0.124)	(0.01)	(0.009)	(0.051)	(0.041)	(0.072)	(0.021)	(0.059)
Conscientiousness	–0.006	–0.016	**0.028*** **	0.001	–0.022	–0.002	0.02	–0.011
	(0.057)	(0.011)	(0.005)	(0.019)	(0.029)	(0.049)	(0.016)	(0.012)
Neuroticism	–0.002	–0.003	–0.005	0.004	–0.006	–0.002	0.006	0.003
	(0.068)	(0.005)	(0.018)	(0.051)	(0.04)	(0.062)	(0.019)	(0.03)

Variable	Type 1. Short-term higher education and work		Type 2. Long-term higher education				Type 3. Non-traditional routes	
	Linear with a combination	Career-oriented	Long career-oriented	Long linear	Deferred	Reversal	Transit	Unstable
The first specialty of higher education (humanitarian profile — a base)								
Socioeconomic	0.08**	**–0.054*** **	–0.017	–0.036	–0.029	**0.127*** **	–0.041	0.04
	(0.032)	(0.007)	(0.011)	(0.046)	(0.092)	(0.036)	(0.032)	(0.035)
Technical	0.045	**–0.012***	**–0.039*** **	–0.006	–0.06	0.071	**–0.052** **	**0.07*** **
	(0.114)	(0.006)	(0.008)	(0.038)	(0.037)	(0.071)	(0.024)	(0.025)
Natural science	0.07	–0.014	**–0.033*** **	–0.015	–0.043	0.057	**–0.102** **	0.066
	(0.06)	(0.014)	(0.008)	(0.052)	(0.042)	(0.06)	(0.052)	(0.042)
Informed choice of specialty	–0.009	–0.002	**0.055*** **	–0.013	–0.004	0.004	0.008	**–0.057*** **
	(0.059)	(0.004)	(0.009)	(0.032)	(0.027)	(0.051)	(0.02)	(0.014)
Socio-demographic characteristics								
Female	0.029	0	**–0.074*** **	0.038	–0.025	–0.018	0.011	–0.014
	(0.11)	(0.01)	(0.015)	(0.074)	(0.049)	(0.07)	(0.031)	(0.031)
Living with parents in the second academic year	0.01	0.003	**0.038*** **	–0.002	0.031	–0.008	0.004	–0.021
	(0.047)	(0.007)	(0.007)	(0.037)	(0.027)	(0.053)	(0.022)	(0.015)
No planning to have children in the near future	–0.03	–0.01	**–0.02***	–0.011	**0.09** **	0.014	–0.021	0.022
	(0.126)	(0.016)	(0.012)	(0.055)	(0.036)	(0.082)	(0.033)	(0.064)
Graduated from school in a locality with a population (a city with a population of more than 680 thousand people — a base)								
Moscow or St. Petersburg	–0.021	0.005	–0.031	–0.07	**0.093*** **	0.053	**0.041*** **	**–0.079*** **
	(0.056)	(0.014)	(0.039)	(0.044)	(0.018)	(0.034)	(0.011)	(0.028)
100–680 thousand people	–0.047	0.039***	**–0.057*** **	0.025	0.018	0.003	–0.006	0.002
	(0.03)	(0.009)	(0.011)	(0.096)	(0.036)	(0.03)	(0.012)	(0.029)
50–100 thousand people	–0.04	**0.082*** **	**–0.065*** **	**0.091** **	0.045	0.052	–0.022	**–0.206*** **
	(0.074)	(0.008)	(0.01)	(0.043)	(0.035)	(0.107)	(0.033)	(0.029)
Village and township	–0.062	0.04	**–0.042*** **	0.004	**0.124***	–0.081	–0.007	–0.036
	(0.086)	(0.027)	(0.015)	(0.056)	(0.072)	(0.069)	(0.024)	(0.022)

Note: standard errors are indicated in parentheses; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The hypothesis that inclusion in the trajectories with continuing studies after receiving a bachelor's degree or a specialist is associated with a higher socioeconomic status and academic abilities was partially confirmed. Specifically, academic abilities proved to be a significant predictor of inclusion in each of the four trajectories associated with long-term education. School students with the highest

TIMSS scores in mathematics are more likely to be in long-term education trajectories than in a linear trajectory, with a difference ranging from 5.9 to 9.4 percentage points, depending on the trajectory.

There was no statistically significant difference in the presence of higher education among parents between those who follow a linear trajectory and participants of the other tracks. Other parameters of socioeconomic status turned out to be statistically significant predictors of long-term education trajectories only for one of them — the long career trajectory. Among its participants, significantly fewer showed high results in TIMSS mathematics. However, the low level of academic success is compensated by the family capital: the participants of the career trajectory have significantly higher cultural capital and educational expectations of parents. This allowed them to be on a trajectory with long-term training on a par with more academically successful peers.

The hypothesis that the inclusion in trajectories with long-term work experience has no significant connections with SES and academic abilities was also only partially confirmed. The statistically significant predictor of the inclusion in both career trajectories, whose participants started working from the 1st academic year, was not academic performance, but another parameter of human capital — non-cognitive characteristics, namely openness to new experience. These data are consistent with the findings of the study, showing that openness is significantly and positively associated with labor market outcomes in Russia [Rozhkova, 2019]. Otherwise, career and long-term career trajectories and their participants are fundamentally dissimilar — in terms of the training duration, socioeconomic status, other parameters of human capital, education and work profile, demographic characteristics. With such radical differences between the two career trajectories, the found universal predictor of an early career track is very important. On the other hand, the SES factor worked unexpectedly: low cultural capital turned out to be a strong predictor of the career trajectory with a short-term higher education, whereas, in the long-term career trajectory, on the contrary, those with the highest SES were included.

The third hypothesis, regarding an unstable trajectory and an increased probability of being in it for those with relatively little human capital, was not confirmed. The probability of inclusion in this track, where graduates spent a significant part of their time after completing their studies in temporary employment and inactivity, was not statistically significantly related to the traditional parameters of human capital such as academic performance and non-cognitive characteristics. Statistically significant predictors of inclusion in the unstable trajectory versus linear were passivity and low information about the choice of the first specialty at the university. In

senior grades, participants of this trajectory were significantly less likely to take a proactive position regarding the choice of a specialty, less likely to independently collect information about their future profession, university, limiting themselves to what was offered at school as career guidance.

4.3. Differences between Trajectories: Factors of 'Deviation' from the Linear Trajectory

Two trajectories that are most similar to the linear one are the linear one with the combination of study with work on senior courses and the long linear one, where after the bachelor's degree the participants entered the master's program and simultaneously entered the labor market. The only statistically significant difference in individual characteristics between the participants of the linear trajectory and the linear one with a combination is the profile of training at the university. The probability of following a linear trajectory with a combination is 8 percentage points higher for those who studied in socioeconomic specialties than for humanities. Presumably, students of socioeconomic areas have more opportunities to combine education with work in their specialty than those who study in the humanities[14]. Moreover, economists and managers benefit particularly strongly from combining — the difference in salaries of graduates who combined their studies with work and less experienced graduates is 40% [Emelina et al., 2022].

The difference between the long linear trajectory and the short linear one is more pronounced, since it implies the continuation of higher education, which is associated with the parameters of human capital. The probability of inclusion in the long linear trajectory versus the short one is 7.5 percentage points higher for more academically capable students who received high math scores in the TIMSS study. However, it can also be assumed that the participants of the long linear trajectory entered the magistracy not only in a proactive effort to increase human capital, but partly out of inertia, using the magistracy as a safety mechanism for a smoother entry into the labor market in a non-native city. Graduates in the long linear trajectory significantly more often than participants in the regular linear trajectory graduated from school in small settlements, indicating educational mobility [Gabdrakhmanov et al., 2022].

If the participants of the linear trajectory had not completed their education after the bachelor's degree, they could have ended up on a deferred trajectory. However, representatives of the deferred trajectory are significantly distinguished not only by high academic performance, which became a factor in continuing education, but also by a generally different chronology of the transition

[14] Monitoring data on the employment of graduates 2018–2020. Rosstat, 2022: https://rosstat.gov.ru/labour_force

to adulthood [Pavlenko, Yakubovskaya, 2020; Hogan, Astone, 1986]. The deferred trajectory can be interpreted not only as a late entry into the labor market, but also as deferred adulthood. By the time of the study, the participants of this trajectory had just completed their studies, almost none of them had any work experience before completing their master's degree. They are statistically significantly different from representatives of the linear trajectory, who have been successfully working in permanent positions for several years in terms of plans for having children: they postpone this event to a more distant perspective.

Another scenario could lead representatives of the linear trajectory to a reverse trajectory, where they could enter the labor market after graduation, but later return to the master's program and combine study with work. However, the probability of inclusion in the reverse track is higher by 9.4 percentage points for mathematics honors students and by 12.7 percentage points for graduates of social and economic specialties. In general, representatives of 'soft' specialties in our sample often found themselves in tracks with long-term education, which may indicate both greater flexibility of representatives of such professions and their willingness to supplement their qualifications with related specialties, as well as the expectation of a high return on a master's degree [Rozhkova et al., 2021].

The participants of the transit trajectory entered a vocational school after the 9th grade, and immediately after receiving secondary vocational education, entered a university. They are statistically significantly distinguished from representatives of the linear trajectory by their academic performance (which is lower), but not by their socioeconomic status. The same conclusion was reached by the authors of the study, which showed that the transit educational track is chosen to reduce the risk of non-admission to university for less successful schoolchildren, however, from families with a relatively high socioeconomic status [Yastrebov, Kosyakova, Kurakin, 2018]. We also found that residents of two largest cities in Russia with an extensive higher education market are more likely to enter the transit trajectory, where it is easier to realize the progression to the university. In addition, there are fewer graduates of technical and natural science specialties among the participants of the transit trajectory, which may be related to an easier progression to higher education from mid-level specialist training programs, many of which have successive bachelor's degree programs, rather than from worker training programs with a predominantly industrial and technical profile.

The greatest differences among the representatives of the linear trajectory are observed with the participants of career-oriented trajectories who entered the labor market immediately after entering the university. For participants of the long career-oriented

trajectory who continued their education after obtaining a bachelor's degree or a specialist, but always combined their studies with work, early entry into the labor market was obviously a desirable and partly encouraged decision. Among the participants of this trajectory, there are significantly more young men and prize-winners of the All-Russian Olympiad of Schoolchildren, they grew up in large cities and in families with significantly higher socioeconomic status (higher cultural capital, educational expectations of parents). Their choice of specialty was significantly more active and informed than that of the participants on the linear trajectory, indicating that their professional self-determination may have occurred earlier and early entry into the labor market, taking into account the choice in favor of socioeconomic specialties, could be quite natural. It is important that despite the early entry into the labor market, there are no other classical attributes of adulthood among participants of the long career-oriented trajectory.

The second trajectory with early entry into the labor market is a short career-oriented trajectory in which education was completed at the bachelor's level and most of the participants work in the service sector. In contrast to the first trajectory, representatives of this trajectory demonstrate greater conventional 'adulthood' by having families and children earlier than others in the sample: 21% of the participants in this trajectory are young parents, while on average across the sample only 7.1% of respondents have children by the age of 24–25. Early entry into the labor market was most likely conditionally forced, dictated by a significantly lower socioeconomic status and academic performance. In terms of cultural capital and academic abilities, representatives of this career-oriented trajectory are closer to the participants of the transit trajectory, i.e. to vocational graduates who entered the university.

In theory, the unstable trajectory is considered the opposite of the linear one, since it leads to temporary employment and other unstable conditions in the labor market [Allen, van der Velden, 2007], but in our study it did not turn out to be so. Deviation from the linear route and entry into the unstable trajectory is strongly associated with only one parameter: the participants of the precarious trajectory made a significantly less informed and conscious decision about their future profession. Given that this track has significantly more people with technical specialties than the linear trajectory, meaning they have a specific set of skills, it can be assumed that transitioning to a new professional field with permanent employment will be more difficult for them than for representatives of other trajectories. Another possible explanation for entry into the unstable trajectory is a conscious choice of graduates in favor of non-standard employment, such as self-employment and freelancing.

5. Discussion

The educational and career paths of highly educated youth are diverse. The traditional understanding of the linear trajectory, implying a sequential transition from high school to university and then to a permanent job, is losing its relevance. Firstly, it is impossible to ignore the mass practice of combining study with work, especially in the magistracy. While a linear trajectory may exist and be successful in the bachelor's degree, the lack of work experience during studying in a master's degree can turn into problems when switching to permanent employment, as evidenced by the deferred trajectory. Secondly, a third of university graduates continue their education in a master's degree immediately or within a year or two. There is a normalization of long-term higher education, when the life trajectory of a 25-year-old person consists of 90% study. At the same time, the master's degree is almost always accompanied by work [Rudakov, Roshchin, 2019], and there is often a productive combination of professional master's degree with work in the specialty [D'Annunzio-Green, Barron, 2019]. If we expand the interpretation of the linear trajectory to include the combination of study and work in senior courses and in the master's degree, it turns out that more than 40% of Russian university graduates are on conditionally linear trajectories. Against the backdrop of many developed countries, this is an atypically successful picture [Walther, Plug, 2006; Furlong, 2016]: due to the specifics of the labor market and the demographic situation, the level and speed of employment of university graduates in Russia are relatively high [Lischuk, Kapelyuk, 2019].

Based on the theories of social reproduction and human capital, we evaluated the relationship between the socioeconomic status and human capital of schoolchildren with their educational and career trajectories formed by the age of 25. Inclusion in trajectories with long-term higher education is associated with higher academic abilities (mathematical literacy), whereas inclusion in early work trajectories is significantly associated with a non-cognitive characteristic — high openness to new experience. Both findings fit well with human capital theory. High socioeconomic status was only significant for one trajectory with long-term education when controlling for human capital and served as compensation for comparatively low academic performance. An unexpected divergence by socioeconomic status occurred in two career-oriented trajectories: for one trajectory, early entry into the labor market during studying could become a forced step or a track in conditions of low SES, whereas for the participants of the 'careerists' track who grew up in more prosperous conditions, early professionalization was encouraged. Inclusion in the least smooth trajectory with an unstable position in the labor market, as it turned out, is not significantly related to[15] either socioeconomic status or the initial stock of human capital.

[15] When describing the results of this study, the category "significant relationship" (with and without the indication of "statistical" significance) is interpret-

On the one hand, the obtained results suggest the relative homogeneity of university graduates in terms of their socioeconomic status and indirectly confirm the discussed increase in the "threshold" for higher education in Russia [Smolentseva et al., 2018; Malinovsky, Shibanova, 2019]. On the other hand, they do not diminish the importance of the SES factor in the success of later educational and career trajectories [Arpino, Gumà, Julià, 2018]. Most studies based on the methodology of sequence analysis consider trajectories that are longer than those in our study, which have formed by the time longitudinal participants reach the age of 30–40 years [Kim, Klager, Schneider, 2019]. By this time, formal education programs have been completed and progress toward the peak of the salary profile begins — thus, it is possible to evaluate the success of trajectories, the role of SES and human capital. Based on the data obtained in these studies [Duta, Wielgoszewska, Iannelli, 2021; Wielgoszewska, 2018], it can be assumed that the SES may be significant in a longer trajectory, taking into account the level of job qualification, professional status, and not just the fact of employment.

Despite the relative homogeneity of the group of respondents, the obtained results advance the discussion on the "long shadow" of starting conditions — SES and human capital — in the educational and labor trajectories of university graduates [Walpole, 2003; Duta, Wielgoszewska, Iannelli, 2021; Arpino, Gumà, Julià, 2018]. The revealed association between higher cognitive abilities in secondary school and a long track in higher education is a contribution to the study on factors influencing the acquisition of higher level of education and, hence, higher long-term labor market outcomes [Altonji, Zhong, 2021]. In addition to the SES parameters, we studied the relationship between trajectories and the components of human capital, expanding the traditional metrics that are limited by cognitive skills [Boylan, 2020; Ranasinghe et al., 2019], due to non-cognitive characteristics, which are also strongly related to labor market outcomes [Heckman, Kautz, 2012]. In this study, we separate SES and cognitive skills, but it is known that a significant portion of the SES effect is realized through academic performance (primary effects) [Havenson, Chirkina, 2019]. For example, the analysis of direct and indirect effects of starting conditions showed that SES indirectly affects the educational and career trajectory through mediator variables related to education, particularly through cognitive skills, university selectivity, and prestige of the specialty [Arpino, Gumà, Julià, 2018].

ed as a statistically significant relationship. However, the absence of a statistically significant relationship is not identical to the absence of a relationship in principle [Bernardi, Chakhaia, Leopold, 2017]. Insufficient statistical significance of the coefficients only means an inability to ascertain their difference from zero — for example, due to insufficient sampling or too many degrees of freedom in the model, and not just the absolute value of the coefficients.

The conducted research has a number of limitations. Firstly, the study is based on data from one cohort — these are ninth graders from 2012 who obtained higher education by 2020 at the age of 24–25. Their trajectories in education and profession unfold in a specific context of socioeconomic and demographic conditions prevailing in a particular period of time, and capture the beginning of the pandemic. Therefore, it is important to carefully extrapolate the results of our study to other cohorts. Secondly, the chosen empirical trajectory research strategy carries well-known problems inherent in longitudinal studies (sample attrition and associated biases), which we did not correct through data imputation procedures. Specifically, in the data from the entire cohort, there was a typical shift towards the more educated, typical for such studies, as well as a gender redistribution in favor of females (see, for example, [Yu et al., 2012; Ranasinghe et al., 2019]). Thus, the results of sequence analysis are not generalizable due to the bias of the analytical sample (see also: [Studer, Struffolino, Fasang, 2018]). Thirdly, the focus of the study was exclusively on individual factors in the formation of educational and professional trajectories, whereas the unfolding of trajectories is undoubtedly influenced by institutional factors [Walther, 2006; Plug, Du Bois-Reymond, 2006], including the characteristics of the territory of residence, the structure of the local labor market, as well as the selectivity of the university. The study of institutional factors may become the subject of further research.

The study was funded by a grant from the Russian Science Foundation (project no. 22-18-00533).

The authors are grateful to anonymous reviewers whose comments, suggestions, and questions significantly improved the quality of the paper.

Appendix 1 Variables used in the study

Variable	Categories	TrEC Wave
Gender	1 — female 0 — male	Wave 2
Place of residence during the period of study at school	City of 680 thousand and more City of 100-680 thousand City up to 100 thousand Village and township Moscow and St. Petersburg	TIMSS-2011 Panel
Living with parents in the second academic year	1 — with parents 0 — no	Wave 5
Reproductive plans	1 — no planning to have children in the next 3 years 0 — have children or are planning to have soon	Wave 8
Education of parents	No higher education One parent with education Both parents have	PISA-2012 Panel with filling in the missing ones by means of TIMSS-2011

Variable	Categories	TrEC Wave
Cultural capital	1 — high (the presence of the whole variety of literature at home / highbrow culture) 0 — low	Wave 2
High educational expectations of parents	1 — high (master's degree and above) 0 — low	Wave 3
Score in Math (TIMSS)	Metric variable	TIMSS-2011 Panel
Prize-winner of the All-Russian Olympiad of Schoolchildren	1 — became a prize-winner at any level 0 — did not participate or had no achievements	Wave 2
Profile of the first specialty	Humanitarian Socioeconomic Technical Natural Science	Wave 4
Awareness of the choice of profession / specialty	1 — informed choice of specialty (at least two independently undertaken career guidance activities) 0 — poorly informed choice	Wave 4
Openness (closeness) to new experiences	Interval variable. The variable was constructed on the basis of the following statements*: It is important for him (her) to invent new things and approach everything creatively. He (she) likes surprises, he always seeks out new activities. I consider myself an open-minded and enthusiastic person. I consider myself an open-minded person, eager for new experiences, multi-faceted	Wave 6 and Wave 8
Conscientiousness	Interval variable. The variable was constructed on the basis of the following statements*: I consider myself a reliable and disciplined person. I consider myself an unorganized, careless person.	Wave 6
Neuroticism	Interval variable. The variable was constructed on the basis of the following statements*: I consider myself an anxious person, it's easy to upset me. I consider myself a calm, emotionally stable person	Wave 6

* The method of principal components with oblique rotation was applied to determine the included statements.

Appendix 2 Characteristics of trajectories and their participants

Variable	Type 1. Short-term higher education and work			Type 2. Long-term higher education				Type 3. Non-traditional routes	
	Linear	Linear with a combination	Career-oriented	Long career-oriented	Long linear	Deferred	Reversal	Transit	Unstable
Number of observations	*187*	*148*	*81*	*151*	*121*	*191*	*106*	*87*	*175*
(sample percentage, %)	*14.9*	*12.0*	*6.5*	*12.1*	*9.7*	*15.3*	*8.5*	*7.0*	*14.0*
Trajectory Characteristics									
Trajectory structure: Study (percentage of trajectory participants, %)	70	70	74	91	92	90	91	81	80

Variable	Type 1. Short-term higher education and work			Type 2. Long-term higher education				Type 3. Non-traditional routes	
	Linear	Linear with a combination	Career-oriented	Long career-oriented	Long linear	Deferred	Reversal	Transit	Unstable
Permanent employment (percentage of trajectory participants, %)	23	26	20	5	4	5	6	12	7
Study without combining with work (percentage of the period of study at the university/ university and college, %)	93	47	7	15	61	89	42	54	65
School education: 11 grades (percentage of trajectory participants, %)	100	100	98.8	100	100	100	100	1.1	100
Have a master's degree (percentage of trajectory participants, %)	0.5	0	4.9	19.9	25.6	38.7	40.6	2.3	16.6
Studying in the master's program in 2020 (percentage of trajectory participants, %)	0	2.7	0	42.4	49.6	18.8	17.9	5.7	2.9
Status in 2020 (percentage of trajectory participants, %): — study without work	0	0.7	0	6	5	16.2	5.7	4.6	1.7
— combining study and work	0	2	0	46.4	54.5	9.4	13.2	4.6	3.5
— permanent employment	94.7	86.5	79	27.2	31.4	36.6	47.2	62.1	39.4
— instability (temporary employment, inactivity, unemployment)	5.3	10.8	21	20.4	9.1	37.8	33.9	28.7	55.4
Sector of employment in 2020 (percentage of trajectory participants, %)): — industry, construction	17	19.1	8.2	20.6	30.9	30.2	24.6	28.1	19.8
— education, science	6.7	11	6.6	22.2	19.5	12.8	10.8	5.3	19.8
— healthcare	4.2	3.7	1.6	7.1	4.1	8.1	9.2	0	7.1
— IT, marketing, media	8.5	18.4	11.5	11.9	12.4	11.6	23.1	1.8	15.1
— finance and law	12.7	10.3	16.4	13.5	6.2	14	10.8	21.1	7.1
— services (other)	18.8	24.3	31.1	14.3	13.4	7	15.4	22.8	17.5
— civil service	21.2	3.7	9.8	3.2	6.2	8.1	3.1	8.8	7.1
— transport	7.3	8.8	11.5	5.6	2.1	7	1.5	10.5	4.8
– agriculture and forestry	3.6	0.7	3.3	1.6	5.2	1.2	1.5	1.8	1.6
Average labor income in 2020 (100 = sample average)	110.9	117.7	110.7	103.6	84.8	89.7	106.8	79.4	96.5

Variable	Type 1. Short-term higher education and work			Type 2. Long-term higher education				Type 3. Non-traditional routes	
	Linear	Linear with a combination	Career-oriented	Long career-oriented	Long linear	Deferred	Reversal	Transit	Unstable
Characteristics of socioeconomic status, human capital									
High educational expectations of parents (percentage of trajectory participants, %)	21.4	30.4	25.9	35.8	25.6	26.7	32.1	10.3	25.7
Higher education (HE) of parents, (percentage of trajectory participants, %): — none of them have HE	32.8	34.3	37.2	25.5	34.8	20.0	28.0	45.1	36.2
— one parent with HE	37.9	32.8	37.2	30.9	24.1	35.4	21.0	37.8	36.2
— both parents have HE	29.4	32.8	25.6	43.6	41.1	44.6	51.0	17.1	27.6
High cultural capital of the family (percentage of trajectory participants, %)	71.7	77.7	65.4	84.1	72.7	73.3	83.0	62.1	65.1
TIMSS score in Math Q1 (honors students) (percentage of trajectory participants, %)	20.9	27.0	13.6	21.9	28.9	36.6	38.7	11.5	18.3
Q2	27.3	19.6	25.9	29.1	25.6	24.6	32.1	11.5	25.7
Q3	24.6	25.7	27.2	27.8	28.1	21.5	19.8	28.7	24.6
Q4	27.3	27.7	33.3	21.2	17.4	17.3	9.4	48.3	31.4
Prize-winner of the All-Russian Olympiad of Schoolchildren (percentage of trajectory participants, %)	26.7	27.0	19.8	37.7	37.2	37.7	33.0	14.9	27.4
Demographic characteristics									
Female (percentage of trajectory participants, %)	71.1	72.3	65.4	55.6	71.1	53.9	57.5	74.7	60.6
Living with parents in the second academic year (percentage of trajectory participants, %)	57.2	45.3	49.4	41.1	52.1	42.9	50.9	37.9	53.1
No planning to have children in the near future (percentage of trajectory participants, %)	34.8	35.1	33.3	43.0	35.5	57.6	49.1	28.7	46.3
Graduated from school in a locality with a population (percentage of trajectory participants, %): Moscow or St. Petersburg	3.3	6.3	2.6	5.5	2.6	8.6	9.6	4.7	3.6
More than 680 thousand people	15.2	25.0	11.7	28.8	17.1	20.3	23.1	21.2	19.0
100–680 thousand people	64.1	56.9	59.7	51.4	61.5	50.3	55.8	58.8	67.3
50–100 thousand people	6.5	4.9	14.3	5.5	10.3	5.9	8.7	5.9	1.8
Village and township	10.9	6.9	11.7	8.9	8.5	15.0	2.9	9.4	8.3

Appendix Socio-demographic characteristics of participants in the zero TrEC wave and samples after sequence analysis

Variable	Categories	TIMSS 2011 (zero wave)	Sampling (nine waves)
Number of observations (pcs)		4893	2085
Gender (%)	Female	49.3	58.8
	Male	50.7	41.2
Number of books at home (%)	0–10 pcs	5.4	3.8
	11–25 pcs	24.7	22.2
	26–100 pcs	36.1	37.6
	101–200 pcs	18.9	20.9
	More than 200 pcs	14.8	15.6
Conditions for studying at home (%)	No private room, no Internet access	5.1	4.3
	There is a private room or Internet access	34.4	34.5
	There is also a private room and Internet access	60.5	61.2
Education level of mother (stepmother) (%)	Primary general, has no primary general education	0.4	0.3
	Incomplete secondary education	7.8	6.5
	Complete secondary education	12.5	10.9
	Secondary vocational education	26.9	26.9
	Higher education	38.3	42.8
	Has an academic degree or two higher educations	2.4	2.0
	I find it difficult to answer	11.7	10.6
Education level of father (stepfather) (%)	Primary general, has no primary general education	0.4	0.3
	Incomplete secondary education	8.0	6.2
	Complete secondary education	10.0	9.8
	Secondary vocational education	27.6	28.1
	Higher education	26.1	27.3
	Has an academic degree or two higher educations	3.2	3.1
	I find it difficult to answer	24.7	25.2
Respondent's educational expectations (%)	Incomplete secondary education	7.2	4.6
	Complete secondary education	7.1	6.9
	Secondary vocational education	16.6	12.4
	Higher education (bachelor's degree, specialty)	55.2	63.0
	Higher education (master's degree and higher, two higher educations)	6.8	7.4
	I find it difficult to answer	7.2	5.8

References

Abbott A., Tsay A. (2000) Sequence Analysis and Optimal Matching Methods in Sociology. *Sociological Methods & Research*, vol. 29, no 1, pp. 3–33. doi:10.1177/0049124100029001001

Alexander K., Entwistle D., Olson L. (2014) *The Long Shadow: Family Background Disadvantaged Urban Youth, and the Transition to Adulthood*. New York: Russell Sage.

Allen J., van der Velden R. (2007) Transitions from Higher Education to Work. *Careers of University Graduates. Views and Experiences in Comparative Perspectives* (ed. U. Teichler), Dordrecht: Springer, pp. 55–78.

Altonji J., Blom E., Meghir C. (2012) Heterogeneity in Human Capital Investments: High School Curriculum, College Major, and Careers. *Annual Review of Economics*, vol. 4, no 1, pp. 185–223. doi:10.1146/annurev-economics-080511-110908

Altonji J., Zhong L. (2021) The Labor Market Returns to Advanced Degrees. *Journal of Labor Economics*, vol. 39, no 2, pp. 303–360. doi:10.1086/710959

Alves M.G., Korhonen V. (2016) Transitions and Trajectories from Higher Education to Work and Back–A Comparison between Finnish and Portuguese Graduates. *European Educational Research Journal*, vol. 15, no 6, pp. 676–695. doi:10.1177/1474904116661200

Anyadike-Danes M., McVicar D. (2005) You'll Never Walk Alone: Childhood Influences and Male Career Path Clusters. *Labour Economics*, vol. 12, iss. 4, pp. 511–530. doi:10.1016/j.labeco.2005.05.008

Arpino B., Gumà J., Julià A. (2018) Early-Life Conditions and Health at Older Ages: The Mediating Role of Educational Attainment, Family and Employment Trajectories. *PLOS ONE*, vol. 13, no 4, Article no e0195320. doi:10.1371/journal.pone.0195320

Autor D.H. (2014) Skills, Education, and the Rise of Earnings Inequality among the "Other 99 Percent". *Science*, vol. 344, no 6186, pp. 843–851. doi:10.1126/science.1251868

Baert S., Neyt B., Omey E., Verhaest D. (2017) *Student Work, Educational Achievement and Later Employment: A Dynamic Approach. IZA Discussion Paper Series no 11127*. Bonn: Institute for the Study of Labor.

Bahr P. (2010) The Bird's Eye View of Community Colleges: A Behavioral Typology of Firsttime Students Based on Cluster Analytic Classification. *Research in Higher Education,* vol. 51, no 8, pp. 724–749. doi:10.1007/s11162-010-9180-5

Becker G.S. (1962) Investment in Human Capital: A Theoretical Analysis. *The Journal of Political Economy*, vol. 70, no 5, pp. 9–49.

Beerkens M., Mägi E., Lill L. (2011) University Studies as a Side Job: Causes and Consequences of Massive Student Employment in Estonia. *Higher Education*, vol. 61, no 6, pp. 679–692. doi:10.1007/s10734-010-9356-0

Bernardi F., Chakhaia L., Leopold L. (2017) 'Sing Me a Song with Social Significance': The (Mis)Use of Statistical Significance Testing in European Sociological Research. *European Sociological Review*, vol. 33, no 1, pp. 1–15. doi:10.1093/esr/jcw047

Bessudnov A., Malik V. (2016) Sotsial'no-ekonomicheskoe i gendernoe neravenstvo pri vybore obrazovatel'noy traektorii posle okonchaniya 9-go klassa sredney shkoly [Socio-Economic and Gender Inequalities in Educational Trajectories upon Completion of Lower Secondary Education in Russia]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 1, pp. 135–167. doi:10.17323/1814-9545-2016-1-135-167

Billari F.C., Hiekel N., Liefbroer A.C. (2019) The Social Stratification of Choice in the Transition to Adulthood. *European Sociological Review*, vol. 35, no 5, pp. 599–615. doi:10.1093/esr/jcz025

Bogdanov M.B., Malik V.M. (2020) Kak sochetayutsya sotsial'noe, territorial'noe i gendernoe neravenstva v obrazovatel'nykh traektoriyakh molodyozhi Rossii? [Social, Territorial and Gender Inequalities in Educational Trajectories of the Russian Youth]. *Monitoring of Public Opinion: Economic and Social Changes Journal*, no 3 (157), pp. 392–421. doi:10.14515/monitoring.2020.3.1603

Bonnard C. (2020) What Employability for Higher Education Students? *Journal of Education and Work*, vol. 33, no 5–6, pp. 425–445. doi: 10.1080/13639080.2020.1842866

Boudon R. (1974) *Education, Opportunity, and Social Inequality: Changing Prospects in Western Society*. New York: John Wiley & Sons.

Bourdieu P. (1986) The Forms of Capital. *Handbook for Theory and Research for the Sociology of Education* (ed. J.G. Richardson), New York: Greenwood, pp. 241–258.

Boylan R.L. (2020) Predicting Postsecondary Pathways: The Effect of Social Background and Academic Factors on Routes through School. *Socius: Sociological Research for a Dynamic World*, vol. 6, Article no 237802311989517. doi:10.1177/2378023119895174

Braun H. (2018) How Long Is the Shadow? The Relationships of Family Background to Selected Adult Outcomes: Results from PIAAC. *Large-Scale Assessments in Education*, vol. 6, no 1, pp. 1–52. doi:10.1186/s40536-018-0058-x

Breen R., Goldthorpe J.H. (1997) Explaining Educational Differentials: Towards a Formal Rational Action Theory. *Rationality and Society*, vol. 9, no 3, pp. 275–305. doi:10.1177/104346397009003002

Breen R., van de Werfhorst H.G., Jæger M.M. (2014) Deciding Under Doubt: A Theory of Risk Aversion, Time Discounting Preferences, and Educational Decision-Making. *European Sociological Review*, vol. 30, no 2, pp. 258–270. doi:10.1093/esr/jcu039

Brown P., Souto-Otero M. (2020) The End of the Credential Society? An Analysis of the Relationship between Education and the Labour Market Using Big Data. *Journal of Education Policy*, vol. 35, no 1, pp. 95–118. doi:10.1080/02680939.2018.1549752

Brunello G., Schlotter M. (2011) *Non-Cognitive Skills and Personality Traits: Labour Market Relevance and Their Development in Education & Training Systems*. IZA Discussion Paper no 5743. Bonn: Institute for the Study of Labor.

Brzinsky-Fay C. (2007) Lost in Transition? Labour Market Sequences of School-Leavers in Europe. *European Sociological Review*, vol. 23, no 4, pp. 409–422. doi:10.1093/esr/jcm011

Brzinsky-Fay C. (2014) The Measurement of School-to-Work Transitions as Processes: About Events and Sequences. *European Societies*, vol. 16, no 2, pp. 213–232. doi:10.1080/14616696.2013.821620

Brzinsky-Fay C., Solga H. (2016) Compressed, Postponed, or Disadvantaged? School-to-Work-Transition Patterns and Early Occupational Attainment in West Germany. *Research in Social Stratification and Mobility*, vol. 46, part A, December, pp. 21–36. doi:10.1016/j.rssm.2016.01.004

Coleman J.S. (1988) Social Capital in the Creation of Human Capital. *American Journal of Sociology*, vol. 94, pp. S95–S120.

Collins R. (1979) *The Credential Society: An Historical Sociology of Education and Stratification*. New York: Columbia University.

Collischon M. (2020) The Returns to Personality Traits across the Wage Distribution. *Labour*, vol. 34, no 1, pp. 48–79. doi:10.1111/labr.12165

Crosta P. (2014) Intensity and Attachment: How the Chaotic Enrollment Patterns of Community College Students Relate to Educational Outcomes. *Community College Review*, vol. 42, no 2, pp. 118–142. doi:10.1177/0091552113518233

D'Annunzio-Green N., Barron P. (2019) Learning Whilst Working: Perceptions on Barriers and Enablers to Transfer of Learning Amongst Part-Time Students on a Professional MSc Programme. *Education + Training*, vol. 61, no 2, pp. 187–200. doi:10.1108/ET-04-2018-0098

Deng Y., Hillygus D.S., Reiter J.P., Si Y., Zheng S. (2013) Handling Attrition in Longitudinal Studies: The Case for Refreshment Samples. *Statistical Science*, vol. 28, no 2, pp. P. 238–256. doi:10.1214/13-STS414

DesJardins S., Ahlburg D., McCall B. (2002) A Temporal Investigation of Factors Related to Timely Degree Completion. *The Journal of Higher Education*, vol. 73, no 5, pp. 555–581. doi:10.1353/jhe.2002.0042

DesJardins S., McCall B. (2010) Simulating the Effects of Financial Aid Packages on College Student Stopout, Reenrollment Spells, and Graduation Chances. *The Review of Higher Education*, vol. 33, no 4, pp. 513–541. doi:10.1353/rhe.0.0169

DiPrete T., Eirich G. (2006) Cumulative Advantage as a Mechanism for Inequality: A Review of Theoretical and Empirical Developments. *Annual Review of Sociology*, vol. 32, no 1, pp. 271–297. doi:10.1146/annurev.soc.32.061604.123127

Du Bois-Reymond M., López Blasco A. (2003) Yo-Yo Transitions and Misleading Trajectories: Towards Integrated Transition Policies for Young Adults in Europe. *Young People and Contradictions of Inclusion: Towards Integrated Transition Policies in Europe* (eds A. López Blasco, W. McNeish, A. Walther), Bristol, UK: Policy, pp. 19–42.

Dudyrev F., Romanova O., Travkin P. (2020) Student Employment and School-to-Work Transition: The Russian Case. *Education + Training*, vol. 62, no 4, pp. 441–457. doi:10.1108/ET-07-2019-0158

Duta A., Wielgoszewska B., Iannelli C. (2021) Different Degrees of Career Success: Social Origin and Graduates' Education and Labour Market Trajectories. *Advances in Life Course Research*, vol. 47. doi:10.1016/j.alcr.2020.100376

Elder G.H., Johnson M.K., Crosnoe R. (2003) The Emergence and Development of Life Course Theory. *Handbook of the Life Course* (eds M.J. Shanahan, J.T. Mortimer, M. Kirkpatrick Johnson), Boston, MA: Springer, pp. 3–19.

Elder S., Kring S. (2016) *Young and Female — A Double Strike? Gender Analysis of School-to-Work Transition Surveys in 32 Developing Economies*. Geneva: ILO.

Emelina N.K., Rozhkova K.V., Roshchin S.Yu., Solntsev S.A., Travkin P.V. (2022) *Vypuskniki vysshego obrazovaniya na rossiyskom rynke truda: trendy i vyzovy* [Graduates of Higher Education in the Russian Labor Market: Trends and Challenges]. Moscow: HSE.

Furlong A. (2016) The Changing Landscape of Youth and Young Adulthood. *Routledge Handbook of Youth and Young Adulthood* (ed. A. Furlong), Abingdon: Routledge, pp. 19–27.

Gabdrakhmanov N.K., Karachurina L.B., Mkrtchyan N.V., Leshukov O.V. (2022) Obrazovatel'naya migratsiya molodyozhi i optimizatsiya seti vuzov v raznykh po razmeru gorodakh [Educational Migration of Young People and Optimization of the Network of Universities in Cities of Different Sizes]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 2, pp. 88–116. doi:10.17323/1814-9545-2022-2-88-116

Garg R., Kauppi C., Lewk J., Urajnik D. (2002) A Structural Model of Educational Aspirations. *Journal of Career Development*, vol. 29, no 2, pp. 87–108. doi:10.1177/089484530202900202

Goldrick-Rab S. (2006) Following Their Every Move: An Investigation of Social-Class Differences in College Pathways. *Sociology of Education*, vol. 79, no 1, pp. 61–79. doi:10.1177/003804070607900104

Gustavson K., von Soest T., Karevold E., Røysamb E. (2012) Attrition and Generalizability in Longitudinal Studies: Findings from a 15-Year Population-Based Study and a Monte Carlo Simulation Study. *BMC Public Health*, vol. 12, no 1, Article no 918. doi:10.1186/1471-2458-12-918

Hanushek E.A., Schwerdt G., Wiederhold S., Woessmann L. (2015) Returns to Skills around the World: Evidence from PIAAC. *European Economic Review*, vol. 73, no 1, pp. 103–130. doi:10.1016/j.euroecorev.2014.10.006

Heckman J.J., Kautz T. (2012) *Hard Evidence on Soft Skills. IZA Discussion Paper no 6580*. Bonn: Institute for the Study of Labor. doi:10.1016/J.LABECO.2012.05.014

Heckman J.J., Stixrud J., Urzua S. (2006) The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. *Journal of Labor Economics*, vol. 24, no 3, pp. 411–482. doi:10.1086/504455

Heckman J., Pinto R., Savelyev P. (2013) Understanding the Mechanisms through Which an Influential Early Childhood Program Boosted Adult Outcomes. *American Economic Review*, vol. 103, no 6, pp. 2052–2086. doi:10.1257/aer.103.6.2052

Hogan D.P., Astone N.M. (1986) The Transition to Adulthood. *Annual Review of Sociology*, vol. 12, pp. 109–130. doi:10.1146/annurev.so.12.080186.000545

Jacob M., Klein M., Iannelli C. (2015) The Impact of Social Origin on Graduates' Early Occupational Destinations. An Anglo-German Comparison. *European Sociological Review*, vol. 31, no 4, pp. 460–476. doi: 10.1093/esr/jcv006

Kautz T., Heckman J., Diris R., ter Weel B., Borghans L. (2014) *Fostering and Measuring Skills: Improving Cognitive and Non-Cognitive Skills to Promote Lifetime Success. NBER Working Paper Series w20749*. Cambridge, MA: National Bureau of Economic Research.

Khavenson T.E., Chirkina T.A. (2019) Obrazovatel'ny vybor uchashchikhsya posle 9-go i 11-go klassov: sravnenie pervichnykh i vtorichnykh effektov sotsial'no-ekonomicheskogo polozheniya sem'i [Student Educational Choice after the 9th and 11th Grades: Comparing the Primary and Secondary Effects of Family Socioeconomic Status]. *The Journal of Social Policy Studies*, vol. 17, no 4, pp. 539–554. doi:10.17323/727-0634-2019-17-4-539-554

Kim S., Klager C., Schneider B. (2019) The Effects of Alignment of Educational Expectations and Occupational Aspirations on Labor Market Outcomes: Evidence from NLSY79. *The Journal of Higher Education*, vol. 90, no 6, pp. 992–1015. doi:10.3102/1436836

Kiryushina M.A., Rudakov V.N. (2021) Gendernye razlichiya v zarabotnoy plate vypusknikov vuzov i uchrezhdeniy SPO na nachal'nom etape kar'ery [The Gender Gap in Early-Career Wages of Universities' and Vocational Education Institutes' Graduates]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 2, pp. 172–198. doi:10.17323/1814-9545-2021-2-172-198

Kivinen O., Nurmi J. (2003) Unifying Higher Education for Different Kinds of Europeans. Higher Education and Work: A Comparison of Ten Countries. *Comparative Education*, vol. 39, no 1, pp. 83–103. doi:10.1080/03050060302563

Klein M. (2021) Who Benefits from Attending Elite Universities? Family Background and Graduates' Career Trajectories. *Research in Social Stratification and Mobility*, vol. 72, Article no 100585. doi:10.1016/j.rssm.2021.100585

Kurakin D. (2020) Tragediya neravenstva: raschelovechivaya "total'nogo cheloveka" [Tragedy of Inequality: Dehumanizing "L'Homme Total"]. *Russian Sociological Review*, vol. 19, no 3, pp. 167–231. doi:10.17323/1728-192x-2020-3-167-231

Lindberg M.E. (2009) Student and Early Career Mobility Patterns among Highly Educated People in Germany, Finland, Italy, and the United Kingdom. *Higher Education*, vol. 58, no 3, pp. 339–358.

Lischuk E.N., Kapelyuk S.D. (2019) Trudoustrojstvo molodykh spetsialistov na rossijskom rynke truda: klyuchevye tendentsii [Employment of Young Professionals in the Russian Labor Market: Key Trends]. *Russian Journal of Labor Economics*, vol. 6, no 3, pp. 1079–1092. doi:10.18334/et.6.3.40871

Lorentzen T., Bäckman O., Ilmakunnas I., Kauppinen T. (2019) Pathways to Adulthood: Sequences in the School-to-Work Transition in Finland, Norway and Sweden. *Social Indicators Research*, vol. 141, no 3, pp. 1285–1305. doi:10.1007/s11205-018-1877-4

Lopatina M.V., Leonova L.A., Travkin P.V., Roshchin S.Yu., Rudakov V.N. (2020) *Vypuskniki srednego professional'nogo i vysshego obrazovaniya na rossijskom rynke truda* [Graduates of Secondary Vocational and Higher Education in the Russian Labor Market]. Moscow: HSE. doi:10.17323/978-5-7598-2195-3

Lucas S.R. (2001) Effectively Maintained Inequality: Education Transitions, Track Mobility, and Social Background Effects. *American Journal of Sociology*, vol. 106, no 6, pp. 1642–1690. doi:10.1086/321300

Machin S., McNally S. (2007) *Tertiary Education Systems and Labour Markets*. Paris: Education and Training Policy Division, OECD.

MaCurdy T., Mroz T., Gritz R. M. (1998) An Evaluation of the National Longitudinal Survey on Youth. *The Journal of Human Resources*, vol. 33, no 2, pp. 345–436. doi:10.2307/146435

Malik V. (2019) The Russian Panel Study "Trajectories in Education and Careers". *Longitudinal and Life Course Studies*, vol. 10, no 1, pp. 125–144. doi:10.1332/175795919X15468755933416

Malinovskiy S., Shibanova E. (2020) *Regional'naya differentsiatsiya dostupnosti vysshego obrazovaniya v Rossii* [Regional Differentiation of Access to Higher Education in Russia]. Moscow: HSE.

Malinovskiy S., Shibanova E. (2019) Higher Education in Russia: Highly Available, Less Accessible // *International Briefs for Higher Education Leaders*. Washington: Center for Internationalization and Global Engagement, iss. 8, pp. 20–22.

Maltseva V.A. (2021) Chto ne tak s kontseptsiey gotovnosti vypusknikov vuza k rabote? [What Is Wrong With the Concept of Job Readiness in Higher Education?]. *Journal of Economic Sociology*, vol. 22, no 2, pp. 109–138. doi:10.17323/1726-3247-2021-2-109-138

Maltseva V.A., Rozenfeld N.Ya. (2022) *Obrazovatel'no-kar'ernye traektorii vypusknikov rossijskikh vuzov na materiale longityudnogo issledovaniya* [Education and Career Pathways of the Russian Universities' Graduates in Longitudinal Perspective]. Moscow: HSE.

Maltseva V.A., Shabalin A.I. (2021) Ne-obkhodnoy manevr, ili Bum sprosa na srednee professional'noe obrazovanie v Rossii [The Non-Bypass Trajectory, or The Boom in Demand for TVET in Russia]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 2, pp. 10–42. doi:10.17323/1814-9545-2021-2-10-42

Marti C.N. (2008) Latent Postsecondary Persistence Pathways: Educational Pathways in American Two-Year Colleges. *Research in Higher Education*, vol. 49, no 4, pp. 317–336. doi:10.1007/s11162-007-9083-2

Mayer K. (2009) New Directions in Life Course Research. *Annual Review of Sociology*, vol. 35, pp. 413–433.

McCarron G.P., Inkelas K.K. (2006) The Gap between Educational Aspirations and Attainment for First-Generation College Students and the Role of Parental Involvement. *Journal of College Student Development*, vol. 47, no 5, pp. 534–549. doi:10.1353/csd.2006.0059

Merton R. (1968) The Matthew Effect in Science. *Science*, vol. 159, pp. 56–63.

Mills M., Praeg P. (2014) *Gender Inequalities in the School-to-Work Transition in Europe*. Santa Monica, CA: RAND Corporation.

Mincer J. (1974) *Schooling, Experience, and Earnings*. New York, NY: National Bureau of Economic Research.

Modestino A., Shoag D., Balance J. (2020) Upskilling: Do Employers Demand Greater Skill When Workers are Plentiful? *Review of Economics and Statistics*, vol. 102, no 4, pp. 793–805. doi:10.1162/rest_a_00835

Monaghan D.B. (2020) College-Going Trajectories across Early Adulthood: An Inquiry Using Sequence Analysis. *The Journal of Higher Education*, vol. 91, no 3, pp. 402–432. doi:10.1080/00221546.2019.1647584

Neyt B., Omey E., Verhaest D., Baert S. (2019) Does Student Work Really Affect Educational Outcomes? A Review of the Literature. *Journal of Economic Surveys*, vol. 33, no 3, pp. 896–921. doi:10.1111/joes.12301

Nilsson B. (2019) The School-to-Work Transition in Developing Countries. *The Journal of Development Studies*, vol. 55, no 5, pp. 745–764. doi:10.1080/00220388.2018.1475649

Noelke C., Gebel M., Kogan I. (2012) Uniform Inequalities: Institutional Differentiation and the Transition from Higher Education to Work in Post-Socialist Central and Eastern Europe. *European Sociological Review*, vol. 28, no 6, pp. 704–716. doi:10.1093/ESR/JCS008

Pavlenko E.S., Yakubovskaya A.A. (2020) Interpretatsii vzrosleniya i formirovanie obrazovatel'nykh traektorij [Interpretations of Adulthood and Formation of Educational Trajectories]. *Monitoring of Public Opinion: Economic and Social Changes Journal*, no 3 (157), pp. 376–390. doi:10.14515/monitoring.2020.3.1604

Plug W., Du Bois-Reymond M. (2006) Transition Patterns between Structure and Agency. *Participation in Transition Motivation of Young Adults in Europe for*

Learning and Working (eds A. Walther, M.D. Bois-Reymond, A. Biggart), Frankfurt am Main: Peter Lang, pp. 107–125.

Prakhov I. (2015) Bar'ery dostupa k kachestvennomu vysshemu obrazovaniyu v usloviyakh EGE: sem'ya i shkola kak sderzhivayushchie faktory [Barriers Limiting Access to Quality Higher Education in the Context of the USE: Family and School as Constraining Factors.]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 1, pp. 88–117. doi:10.17323/1814-9545-2015-1-88-117

Psacharopoulos G., Patrinos H.A. (2018) Returns to Investment in Education: A Decennial Review of the Global Literature. *Education Economics*, vol. 26, no 5, pp. 445–458. doi:10.1080/09645292.2018.1484426

Quintini G., Manfredi T. (2009) *Going Separate Ways? School-to-Work Transitions in the United States and Europe*. Paris: OECD.

Ranasinghe R., Chew E., Knight G., Siekmann G. (2019) *School-to-Work Pathways*. Adelaide SA 5000, Australia: National Centre for Vocational Education Research.

Roshchin S.Yu. (2006) *Perekhod "uchyoba–rabota" — omut ili brod? Preprint WP3/2006/10*. [The School-to-Work-Transition: A Slough or a Ford? Working Paper WP3/2006/10]. Moscow: HSE.

Roshchin S., Rudakov V. (2016) Patterns of Student Employment in Russia. *Journal of Education and Work*, vol. 30, no 3, pp. 314–338. doi:10.1080/13639080.2015.1122182

Rozhkova K.V. (2019) Otdacha ot nekognitivnykh kharakteristik na rossijskom rynke truda [The Return to Noncognitive Characteristics in the Russian Labor Market]. *Voprosy ekonomiki*, no 11, pp. 81–107. doi:10.32609/0042-8736-2019-11-81-107

Rozhkova K.V., Roshchin S.Yu. (2021) Vliyanie nekognitivnykh kharakteristik na vybor traektoriy v vysshem obrazovanii: vzglyad ekonomistov [The Impact of Non-Cognitive Characteristics on the Higher Education Choice-Making: An Economist Perspective]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 3, pp. 138–167. doi:10.17323/1814-9545-2021-3-138-167

Rozhkova K.V., Roshchin S. Yu., Solntsev S.A., Travkin P.V. (2021) Otdacha na magisterskuyu stepen' na rossijskom rynke truda [The Return to Master's Degree in the Russian Labor Market]. *Voprosy ekonomiki*, no 8, pp. 69–92. doi:10.32609/0042-8736-2021-8-69-92

Rudakov V., Roshchin S. (2019) The Impact of Student Academic Achievement on Graduate Salaries: The Case of a Leading Russian University. *Journal of Education and Work*, vol. 32, no 2, pp. 156–180. doi:10.1080/13639080.2019.1617839

Scherer S. (2001) Early Career Patterns: A Comparison of Great Britain and West Germany. *European Sociological Review*, vol. 17, no 2, pp. 119–144. doi:10.1093/ESR/17.2.119

Schultz T.W. (1961) Investment in Human Capital. *The American Economic Review*, vol. 51, no 1, pp. 1–17.

Smolentseva A., Froumin I., Konstantinovskiy D., Lisyutkin M. (2018) Stratification by the State and the Market: High Participation Higher Education in Russia. *High Participation Systems of Higher Education* (eds B. Cantwell, S. Marginson, A. Smolentseva), Oxford: Oxford University, pp. 295–333.

Spence M. (1973) Job Market Signaling. *Quarterly Journal of Economics*, vol. 87, no 3, pp. 355–374. doi:10.2307/1882010

Studer M., Struffolino E., Fasang A. (2018) Estimating the Relationship between Time-Varying Covariates and Trajectories: The Sequence Analysis Multistate Model Procedure. *Sociological Methodology*, vol. 48, no 1, pp. 103–135. doi:10.1177/0081175017747122

Tan T.S., Lim E., Loke Y.J. (2020) Number of Term-Time Working Hours among Undergraduate Students. *Education + Training*, vol. 62, no 4, pp. 427–440. doi:10.1108/ET-06-2019-0119

Torche F. (2011) Is a College Degree Still the Great Equalizer? Intergenerational Mobility across Levels of Schooling in the United States. *American Journal of Sociology*, vol. 117, no 3, pp. 763–807. doi:10.1086/661904

Twisk J., de Vente W. (2002) Attrition in Longitudinal Studies: How to Deal with Missing Data. *Journal of Clinical Epidemiology*, vol. 55, no 4, pp. 329–337. doi: 10.1016/s0895-4356(01)00476-0

Walpole M. (2003) Social Mobility and College: Low SES Students' Experiences and Outcomes of College. *The Review of Higher Education*, vol. 27, no 1, pp. 45–73. doi:10.1353/rhe.2003.0044

Walther A. (2006) Regimes of Youth Transitions: Choice, Flexibility and Security in Young People's Experiences across Different European Contexts. *Young*, vol. 14, no 2, pp. 119–139. doi:10.1177/1103308806062737

Walther A., Plug W. (2006) Transitions from School to Work in Europe: Destandardization and Policy Trends. *New Directions for Child and Adolescent Development*, vol. 113, February, pp. 77–90. doi:10.1002/cd.170

Werfhorst van de H.G., Hofstede S. (2007) Cultural Capital or Relative Risk Aversion? Two Mechanisms for Educational Inequality Compared. *The British Journal of Sociology*, vol. 58, no 3, pp. 391–415. doi:10.1111/j.1468-4446.2007.00157.x

Wielgoszewska B, (2018) Onwards and Upwards? Migration and Social Mobility of the UK Graduates. *Regional Studies, Regional Science*, vol. 5, no 1, pp. 402–411, doi:10.1080/21681376.2018.1552188

Yastrebov G., Kosyakova Y., Kurakin D. (2018) Slipping Past the Test: Heterogeneous Effects of Social Background in the Context of Inconsistent Selection Mechanisms in Higher Education. *Sociology of Education*, vol. 91, no 3, pp. 224–241. doi:10.1177/0038040718779087

Yu S., Bretherton T., Schutz J., Buchanan J. (2012) *Understanding the Nature of Vocations Today: Exploring Labour Market Pathways*. Adelaide SA 5000, Australia: National Centre for Vocational Education Research.