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Work trajectories and status attainment process: a study using sequence analysis

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Abstract

Applying sequence analysis methods to work trajectories recorded in the 2012 China Labor Force Dynamics Survey, this study examines the types of work trajectories in China's urban labor market in three dimensions: employment status, organizational type, and work position. The findings suggest that along with the market transition, China's urban labor market is experiencing diverse and complex job mobility patterns. This study identifies four types of work trajectories: the merit-based work trajectory, the blue-collar's work trajectory in the private sector, the blue-collar's work trajectory in state-owned enterprises, and the self-employed trajectory. These four typical work trajectories have significantly different influences on individuals' attainment of socio-economic status and elite status. This study sheds light on the microprocesses in status attainment by examining the role of work trajectories from a longitudinal perspective.

Keywords: Job mobility, Work trajectories, Sequence analysis, Status attainment

Introduction

The Blau–Duncan status attainment model (Blau and Duncan 1967) is a classic model in the field of social stratification and mobility. Taking educational attainment and first occupation as mediating factors, this model estimates both the direct effect and indirect effect of family background on individual status attainment using path analysis (Blau and Duncan 1967). The status attainment model highlights two key transitions between the individual's social origin and socioeconomic destination: educational attainment and first occupation. Correspondingly, the model implicates three logical chains (Jarvis and Song 2017): the effect of family background on individual educational attainment, the school-to-work transition process, and the effect of job mobility within individual careers on socioeconomic status.

Job mobility throughout a career generates intragenerational mobility. In the status attainment model, however, this process is simplified in the reduced form of the path model, where only the first occupation variable is controlled and without further discussion. In earlier studies, such simplification is to be expected and advantageous. First, scholarly interest in social mobility centered on intergenerational mobility. Assuming that one's occupation is a relatively stable indicator of social status, empirical models often measure socioeconomic status with a middle-aged individual's occupation.

Comparative intergenerational stratification research further assumes that occupation-based socioeconomic status is similar and stable across countries and regions when conducting international comparisons (Ganzeboom et al. 1991). These assumptions, supported by both theoretical and empirical support, provide operational convenience. Second, cross-sectional data and statistical analysis techniques constrained previous studies on intragenerational mobility to single job change, and it was thus difficult to expand the time window to incorporate long-term career analysis.

This study focuses on work trajectories comprising multiple job changes and examines the heterogeneous effect of work trajectories on individual status attainment. This study is motivated by the following considerations. First, there are multiple measurements of socioeconomic status, including economic measurement (income), occupational measurement (socioeconomic index, SEI), authority measurement (professional ranks and titles), and productive relations (employed versus self-employed). Research using cross-sectional information on individual occupation simplifies the process of change in the individual's position in the labor market and therefore fails to reflect the deeper process and mechanisms of social stratification and mobility. Second, existing research has shown that the increase in labor market uncertainty has resulted in significant upward trends of intragenerational job mobility (Jarvis and Song 2017). Without considering this fact, cross-sectional data may underestimate intergenerational immobility, which is similar to biased estimates of models due to measurement errors. Third, job mobility within and across organizations can affect the individual accumulation of human capital and patterns of income change, leading to differentiation in life opportunities and exacerbating income inequality (Wu 2011a). Last, the availability of long-term panel data and improvements in sequence analysis methods are prerequisites for research on career mobility and work trajectory analysis (Abbott 1995).

Although existing studies have examined the effect of job mobility on social status attainment (Liu 2011; Wu 2011a 2011b), analytical conceptualization and empirical research on work trajectories have been overlooked in the literature. Previous studies on job mobility adopt one of two perspectives, taking job mobility as the dependent or independent variable. The first approach takes job mobility as the individual's life chance and then analyzes the probability of job mobility and its influential factors. Relevant theoretical models include the resource–reward model, the limited opportunity model, and the vacancy competition model (Hachen 1990). These studies are concerned mostly with how individual factors (both ascribed and achieved) and structural limitations affect the inequality of mobility opportunities (Li et al. 2016; Wang and Li 2001; Zhang 2011). Other studies examine the influence of institutional change on individual life chances based on the possibility of cross-sectoral mobility during the market transition (Zhou et al. 1997) and discuss the openness of the Chinese labor market (Li et al. 2016).

The second perspective investigates the socioeconomic consequences of job mobility, that is, the effect of job mobility on income, promotion, and occupational status attainment. Relevant theoretical models include salary matching theory, job search theory, and labor market segmentation theory (Liu 2011). Existing theoretical work has pointed out the heterogeneous effect of job mobility on income. Job changes increase the income of those with lower educational levels but not those with higher ones (Wu 2011a). In China's dual system segmentation labor market, cross-institutional job mobility results

in a higher income increase (Zhou and Xie 2019). However, the unit of analysis of studies from both perspectives is usually the single-time job change event at a cross-sectional time point rather than the work trajectory. Therefore, there is room for improvement in job mobility analysis and research design. First, job changes in one's career are not independent of each other. Previous job changes may affect subsequent ones and thereby shape work trajectories. Second, work trajectories provide the means to obtain socioeconomic status. It is necessary to expand research to consider more than one-time job changes to understand the effects on individual status attainment processes and social stratification.

The studies mentioned above provide the starting point of this research. Under the current social circumstances in China, it is especially insightful to map out the distribution of work trajectories and investigate the effect of work trajectories on status attainment. First, in contrast to job immobility patterns before the market transition (Walder 1986), China's labor market during the transition exhibits diverse economic forms, a complex division of labor, multiple employment statuses (Meng 2012), and significant increases in intragenerational job mobility (Zhou 2019). For most individuals, socioeconomic status and social mobility are achieved through highly heterogeneous job mobility patterns in the labor market. Second, job mobility in China results from not only individuals' rational choices based on their market capacity but also the structural constraints of the labor market. Organizations, as the medium between market capacity and life opportunity, strongly influence the efficiency of conversion between market resources and market payoff. Work trajectories during the market transition, giving special attention to the role of work organizations, provide an important clue to understanding how institutional transitions shape economic behavior in the labor market and what mechanisms constitute social inequality. However, existing research lacks empirical analysis that systematically discusses the basic patterns and socioeconomic consequences of work trajectories in the labor market in the transition era. Thus, the third logical chain of the status attainment process—the effect of job mobility within individual careers on socioeconomic status—remains unstudied.

Focusing on the work trajectory of sequential job changes occurring within a certain duration in an individual's career, this study analyzes the typical pattern of job mobility in the contemporary Chinese urban labor market. It provides new empirical insight into the process and mechanism of individual status attainment. This study aims for two outcomes. The first is a typology of work trajectories in China's urban labor market. Specifically, it applies sequence analysis on work history data to characterize and identify typical work trajectories in the labor market. The second is an analysis of how these different types of work trajectories influence individuals' attainment of socioeconomic status and elite status.

Work trajectories and status attainment

Job mobility in the theory of social stratification

Market and work conditions

In contrast to the classical theory of social stratification and mobility that focuses on the occupation of economic resources, contemporary studies have started paying more attention to work conditions and job mobility. All classical theoretical ideas take the

possession of economic resources in the market as the main force for shaping social differentiation by discussing class (propertied or propertyless), institution (the market), status (market capacity), or division of labor. However, with social changes in modern society, earlier standards of stratification based on economic capital or interest gradually faced the dilemma of insufficient explanatory power. For example, traditional theories emphasize that market resources or capacity can affect people's life chances of gaining social status. However, the increasing complexity of the bureaucratic structure of various social organizations in the market makes this logical chain unclear and poorly explained. Work organizations and job conditions together shape the differences in social status among social groups. Against this backdrop, neo-Marxists and neo-Weberians have turned to "work conditions" as a more powerful explanatory conceptual tool for stratification analysis (Li and Qin 2016). From a neo-Marxist perspective, Wright proposes the multiple asset-exploitation framework, which emphasizes that authority should be assessed by organizational assets and the number of employees and that an individual's work organization or their position within the organization should serve as the crucial indicator of their social class (Wright 1985). Neo-Weberian scholars put even more stress on work conditions that reflect power and authority relations within an organization (Goldthorpe 1982). Recent literature on social stratification and mobility further highlights the effect of work conditions on shaping social stratification, demonstrating scholarly consensus on this theme (Li and Qin 2016).

Intragenerational job mobility and status attainment

The sequence and trajectory of intragenerational job mobility have important implications for social stratification and mobility. For the individual status attainment process, job mobility as the medium of intragenerational social mobility is the key component of career paths. In existing research, the unit of analysis of job mobility is either a job change or the relationship between two adjacent jobs in one's work history (Zhou et al. 1997; Zhang 2011; Li et al. 2016Wang et al. 2001). Job mobility refers to a series of job changes in an individual's life course, shaping a unique work trajectory and career path and demonstrating the cumulative effect of individual work experience (Kalleberg and Mouw 2018). However, most existing studies examine only a single job change event and thus fail to capture this cumulative effect over a career. From a sequential perspective, if individuals change jobs that differ in number, frequency, and sequence, their career paths will be different as well, producing differences in income, opportunities, and other welfare conditions and eventually shaping their status attainment process and social inequality in the labor market. Thus, a discussion of how different work trajectories affect individual status attainment will help us understand an important mechanism in social mobility and the reproduction of social inequality in the labor market.

Work trajectories and status attainment since China's market transition

Diversity and complexity of work trajectories

Since the beginning of the market transition in the 1980s, China's labor market has experienced structural transformation. An increasing number of individuals with heterogeneous characteristics have participated in the emerging labor market. These changes together have contributed to the diversity and complexity of work trajectories in China's

urban labor market. Here, diversity refers to the variation between the work trajectories of different individuals, and complexity means the variation between job changes within an individual's work trajectory.

First, the urban labor market has seen structural changes in market conditions, work conditions, and organizational medium. Since the reform, the private sector has appeared and gradually expanded to occupy the majority of the market. State-owned, privately owned, and foreign-invested sectors have diversified the market and created more employment opportunities for individuals (Meng 2012). People can either be employed in different market sectors or become private entrepreneurs or self-employed. In terms of work conditions, the market transition has introduced more diversity and hierarchy into the division of labor and occupational types. The gradual transition has also shaped institutional segmentation in the labor market, distinguishing the opportunities and consequences of job mobility in different types of work organizations ("*danwei*") (Li et al. 2016). Second, under structural constraints, individuals' heterogeneity in resource endowment, including family background, human capital, previous job opportunities, and occupational choices, will influence subsequent work trajectories (Wu 2011a), shaping individuals' different career paths.

As the literature on market transition theory demonstrated, pre-reform China with its planned economy did not have a real labor market. Urban people had highly homogeneous career patterns, in which the initial job assigned by the state played the most important role. Other than occasional job changes assigned by their supervisor, an individual was mostly stuck in the work organization with a fixed career path (Walder 1986; Xie 2010). There was little diversity or complexity of work trajectories. A crucial aspect of the gradual market transition is establishing a labor market based on demand–supply relations and the logic of productive efficiency. It is, therefore, a process of gradually liberating labor resources. One of the most important consequences of this transition process is the ever more frequent and freer job mobility in the labor market. Studies have shown that while job mobility was rare before the reform (Davis 1992), it has become commonplace as the market transition deepens. Despite institutional segmentation in the labor market, job mobility has become an important component of individual career paths, whether through voluntary job changes or passive ones due to layoffs. In China's current labor market, rarely anyone sticks to one job during their entire career.

As such, during the market transition in China, changes in structural factors and individual labor characteristics combine to generate a high level of heterogeneity in work trajectories. Work trajectories are diverse between different individuals and complex for each individual during the course of a career.

Cross-organizational job mobility

Given the increasing diversity and complexity of individual work trajectories since the market transition, a crucial dimension defining job mobility in China's labor market is cross-organizational job mobility, especially between different organizational types. The type of work organization ("*danwei*") is one of the most important characteristics of a given job in China's labor market. Before and at the beginning of the reform, the administrative level of a work organization reflected the amount of resources enjoyed by its employees (Li et al. 2006). In contrast to Western societies in which the division

of occupations reflects the stratification of socioeconomic status, work organizations are crucial for individuals' status attainment under state socialism in China. The distance of a work organization to state power and its administrative ranking indicate the amount of resources and political power an organization has, which in turn determines its ability to dominate social resources based on the system of state regime and the party (Lu 2004). In the planned economy era, one's work organization, political identity (e.g., party member), and *hukou* identity are relatively more important than the occupation in social stratification (Bian 2002), with institutional segmentation being more influential than occupational division.

In the process of market transition and institutional change, the role played by work organizations becomes more complicated. Lu (2004) summarizes that industrialization and marketization introduce new drivers of social stratification. First, industrialization entailed a society-wide change from a traditional agricultural economy to a modern industrial economy, which brought about a division of labor and specialization and promoted the large-scale development of bureaucracy. Second, marketization caused ownership of the means of production to differentiate. The emergence of private property, the private sector, and foreign investment changed centralized public ownership before the reform (Lu 2004). In the socialist market economy, multiple forms of ownership coexist and center on public ownership. Such an ownership structure distinguishes between more types of work organizations and shapes the dual segmentation of state-owned and nonstate-owned sectors. Existing research has found that at the beginning of the market transition, cross-organizational job mobility was limited (Zhou et al. 1997) and strongly selective (Wu 2006). Later in the transition, there was a great increase in opportunities for cross-organizational mobility in the primary labor market (Li et al. 2016), with income premiums associated with such mobility (Zhou and Xie 2019). In the secondary labor market, due to employment instability and an increase in precarious jobs, cross-organizational mobility has also shown an upward trend. Such mobility helps less educated groups in the secondary labor market increase their income (Wu 2011a) and avoid unemployment but exacerbates job instability and stops the accumulation of human capital. Therefore, different types of cross-organizational job mobility may have different sociological meanings (Zhou 2019).

Previous research shows the importance of organizational type as a dimension to describe work trajectories in the contemporary labor market. Individuals work in different types of organizations and subsequently make job changes between them, and this process may have a cumulative effect on subsequent job mobility. However, whether this cumulative effect is advantageous or disadvantageous needs to be investigated further with regard to the individual's work position. In other words, the effect of cross-organizational job mobility on individual status attainment should depend on not only the change in work organization type itself but also the individual's structural position in the organization.

Job mobility under the hierarchical authority system

Work positions inside an organization demonstrate an authority hierarchy, including the authority of the managerial level and the authority of technical skill. In a given work organization, one's work position determines, on the one hand, the quality of work

conditions and the level of salary and welfare and, on the other hand, the power of control over resources and the authority relationship with subordinates. This fact is one of the most important mechanisms that shape social inequality within work organizations (Li and Qin 2016). Based on the authority hierarchy, job mobility in the work position is another crucial dimension in shaping work trajectories in China's labor market since the market transition. Job mobility under the hierarchical authority system is characteristically sequential. That is, job changes often happen level-by-level, directly reflecting intragenerational upward mobility, which is an important mechanism of status attainment. When individuals are promoted to high-ranking positions, such as high-level managerial or technical skill positions in the authority hierarchy, their promotion is often seen as an indicator of elite status attainment.

Research on job mobility in China's labor market focuses mostly on cross-organizational and cross-sectoral mobility (Li 2013; Li et al. 2016; Zhou et al. 1997; Zheng 1999) to emphasize the influence of work organizations as the medium on individual life opportunities and status attainment during institutional transformation. This line of research is built on the premise that different organizational types implicate different resources and opportunities in the Chinese context (Bian 2002). However, as the scale of work organizations expands and as the bureaucratic structure complexifies, heterogeneity within each work organization type, including the distinction between physical and nonphysical work and different distributions of organizational assets and technical assets in nonphysical work, becomes an important variable influencing work conditions (Wright 1985) and status attainment. For example, the dual paths of Chinese elites based on the authority of organizational administration and the authority of technical skill are distinctive features of Chinese organizations (Walder et al. 2000). In the dual career paths model, managerial positions and technical skill positions have different work trajectories, but both reflect intragenerational mobility. These two career paths were relatively parallel in the early stage of the transition, and it was difficult to switch between them. Two types of elite status attainment emerged, that is, the managerial elite and the technical elite. With the deepening of reform, education became equally important in both hierarchical authority systems (Walder et al. 2000). Thus, many individuals have overlapping work trajectories across managerial and technical systems. With the initial and accumulated advantages of managerial levels or technical skills, work trajectories within an authority hierarchy help individuals obtain a higher overall occupational status and become managerial or technical elites. By including work position as a dimension in studying work trajectories, this study extends the literature and deepens the analysis of work trajectories' effect on intragenerational upward mobility.

In addition to the dimension of organizational type and work position, the analytical framework should include individuals' employment status in the labor market (employer/self-employed or employed) to capture their most basic economic status. Previous studies demonstrate that as the market transition deepens, groups that change from being employed to self-employed consist mainly of individuals with voluntary job mobility (Wu 2006) and entrepreneurship (Gerber 2001), and these characteristics help them advance to become elite entrepreneurs. Thus, work trajectories based on employment status can systematically affect individual status attainment.

To summarize, the three dimensions this study uses to study work trajectories are organizational type, work position in the authority hierarchy, and employment status. Employment status reflects the individual's basic market condition, organizational type denotes the organizational medium characteristics, and work position reflects work conditions and authority relations. Based on previous theoretical and empirical studies, this study proposes two predictions. First, sequence analysis can identify empirically meaningful and typical work trajectories in China's urban labor market based on these three dimensions. Second, different work trajectories have a discriminative influence on individuals' overall status and elite status attainments, including the following: (1) the individual's work position may help to determine how cross-organizational job mobility affects status attainment, (2) work trajectories within the authority hierarchy system may help individuals obtain higher overall occupational status and become managerial or technical elites, and (3) self-employment may help individuals acquire higher income and eventually become entrepreneurial elites.

Identification of work trajectories using sequence analysis

Sequence analysis

In recent years, the availability of panel data and the development of sequence analysis (Abbott 1995; Abbott and Hrycak 1990; Cornwell 2015) have enriched research on work trajectories. The sequence of job changes, that is, the temporal order of each job change, captures individuals' choices based on structural constraints and their resource endowment, thereby constructing their unique career paths. From a longitudinal perspective, research on work trajectories can help us discover the concrete process of status attainment, social stratification, and mobility. Sequence analysis is a data-driven method that draws on data characteristics and uses specific algorithms[1] to identify and induct typical sequences to describe or explain intragenerational mobility patterns (Halpin 2017).

There are two stages of the application of sequence analysis in sociological research (Cornwell 2015). Abbott was the first to introduce sequence analysis from molecular biology into sociology and apply it to historical sociology. Using optimal matching analysis, Abbott and Hrycak (1990) discussed the professional path of German musicians' careers. In subsequent research, Abbott investigated the process of a series of professions using sequence analysis. His major contribution is twofold. First, he introduced the technique of processing sequence data. Second, he introduced the perspectives of time and sequence into theoretical research in sociology. The sequential perspective emphasizes the change in foci "from units to context, from attributes to connections, from causes to events" in constructing theory (Abbott 1995 2001). Subsequently, a variety of sociological studies that apply sequence analysis methods have emerged, including studies on the career paths of women in finance, short-term postretirement patterns, and resemblances between couples' career paths. All these studies introduced the first stage of sequence analysis application (Cornwell 2015). After an intensive discussion on the optimal matching algorithm in 2000, sequence analysis application entered the second stage, which was used mostly in life course studies, with an emphasis on key transitions

[1] The most often used algorithm is the optimal matching algorithm, which facilitates sequence analysis based on cost minimization.

in the life course, such as the school-to-work transition, the adolescence-to-adulthood transition, women's first birth and subsequent employment status. Some studies also extended the analysis to other themes, such as individuals' daily use of time, migration trajectories, or the life course of organizations. The optimal matching algorithm used in sequence analysis has significantly developed in this stage.

Methodologically speaking, sequence analysis focuses on the similarity and difference in discrete time order between different elements (states, events). Using data-driven technology, it identifies multiple typical sequences to describe the pattern of a specific phenomenon. Sequence data are one-dimensional and sequential panel data, and possible dimensions include time, DNA sequence, and conversations (Abbott 2001). In sociology, sequence analysis is often used to describe and categorize trajectories of events unfolding in consecutive time periods, such as those in the life course, i.e., migration, marriage, and professional career. Specifically, sequence analysis applies algorithms such as optimal matching to calculate the insertion cost, deletion cost, or substitution cost, compare the distance between two sequences in each state at each time point, categorize those with the least difference distance, and obtain several types of typical trajectories among all the trajectories (Halpin 2017).

For this study, sequence analysis is especially advantageous in analyzing work trajectories. First, sequence analysis methods best serve the needs of this study. Sequence analysis builds a model of the individual's job changes within a certain duration and incorporates information, including the order and length of each job to account for the cumulative effect of work trajectories. In contrast, previous research either focused on a single job change or used the number of job changes as a variable. Second, sequence analysis can include the definition of job mobility on multiple dimensions and perform dimensionality reduction on them. Existing research either narrowly defines job mobility in terms of cross-organizational or cross-sectoral change or only occupational mobility within a work organization. This study uses sequence analysis, based on existing theory and empirical research, to conceptualize job changes with different dimensions and categorize work trajectories. As such, sequence analysis not only processes more information to describe the distribution of job mobility but also effectively identifies typical trajectories, which helps analyze the cumulative effect of job mobility on status attainment.

Conceptualization and operationalization of "work state"

To apply sequence analysis to study work trajectories, a key step in the operationalization is to define the "work state," that is, "elements" at each sequence time point. An ideal definition of "work state" should not only fit with theories of social stratification in the labor market but also empirically reflect the social facts of China's labor market. A definition that is too narrow would confuse the analysis and swell calculations and make it difficult to identify typical work trajectories. A definition that is too broad, on the other hand, would fail to capture patterns with heterogeneous characteristics, overlooking their sociological meanings. This study defines the work state from three dimensions: employment status reflecting the market condition, work position in the authority hierarchy, and organizational type capturing the effect of the organizational medium. Employment status here includes self-employed and employed by others; work position

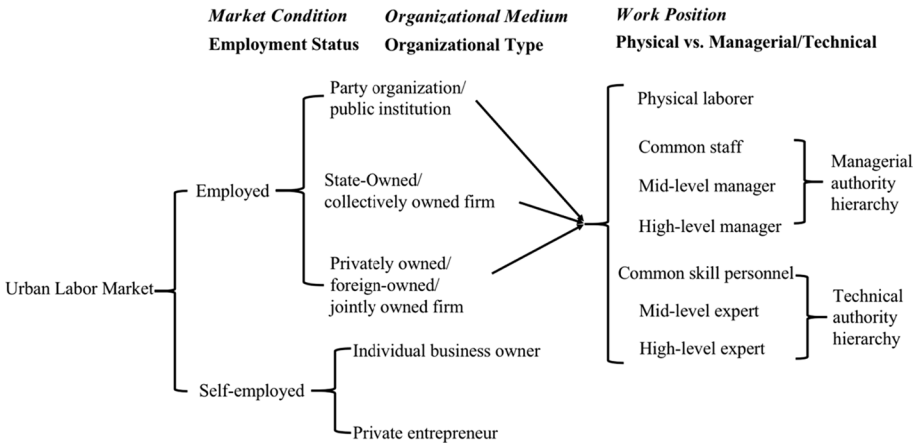

Fig. 1 Conceptualization of work state

includes physical work and nonphysical work in the authority hierarchy (managerial or technical); organizational medium is distinguished by the type of work organization ("*danwei*"). Figure 1 shows the measurement of the three dimensions and the conceptualization of the work state on the work sequence.

Specifically, first, an individual's market condition refers mainly to his or her employment status—self-employed or employed by others, with the self-employed status including both private entrepreneurs and individual business owners. This dimension reflects ownership of economic resources, broadly defined. Second, an individual's work position in the labor market includes physical work, managerial nonphysical work, and technical nonphysical work. The measurement of the managerial authority system includes common staff, mid-level managers, and high-level managers. The measurement of the technical authority system includes common skill personnel, mid-level experts, and high-level experts. This dimension reflects the individual's structural position in the work organization and the underlying authority relations. Finally, the organizational medium is operationalized through the main type of work organization, including party organization or public institution, state-owned or collectively owned firm, and privately owned, foreign-owned, or jointly owned firm. This dimension reflects the organizational and institutional resources behind the work state. The interaction of these three dimensions produces a total of 23 work states for sequence analysis.[2]

[2] The 23 work states include: "physical laborer in party organization or public institution," "common staff in party organization or public institution," "mid-level manager in party organization or public institution," "high-level manager in party organization or public institution," "common skill personnel in party organization or public institution," "mid-level expert in party organization or public institution," "high-level expert in party organization or public institution," "physical laborer in state-owned or collectively owned firm," "common staff in state-owned or collectively owned firm," "mid-level manager in state-owned or collectively owned firm," "high-level manager in state-owned or collectively owned firm," "common skill personnel in state-owned or collectively owned firm," "mid-level expert in state-owned or collectively owned firm," "high-level expert in state-owned or collectively owned firm," "physical laborer in privately owned, foreign-owned, or jointly owned firm," "common staff in privately owned, foreign-owned, or jointly owned firm," "mid-level manager in privately owned, foreign-owned, or jointly owned firm," "high-level manager in privately owned, foreign-owned, or jointly owned firm," "common skill personnel in privately owned, foreign-owned, or jointly owned firm," "mid-level expert in privately owned, foreign-owned, or jointly owned firm," "high-level expert in privately owned, foreign-owned, or jointly owned firm," "self-employed (individual business owner)," and "self-employed (private entrepreneur)."

Data and variables

This study uses data from the 2012 China Labor Force Dynamic Survey (CLDS 2012). CLDS2012 retrospectively collects respondents' detailed work history information in China's urban labor market, thus constructing their individual work trajectories. This study limits the sample to nonagricultural laborers and uses the first 12 years of work history within respondents' careers in the sequence analysis to identify their typical work trajectories. After data cleaning, the sample includes work sequences of 4,149 respondents. The time unit of work sequences is the year, with each year having a distribution of the 23 work states. Every respondent has one work state at each year point, which combines to form their sequence work trajectory.

The first goal of this analysis is to identify and categorize the types of work trajectories. After distinguishing between individual work sequences, the author compares different work sequences using the optimal matching algorithm. Using K-means clustering methods, all samples are categorized based on their similarity in work sequences, and typical trajectories with the largest between-group variation and smallest within-group variation are distinguished.

The second goal of this study is to analyze how different types of work trajectories influence status attainment and thus examine the effect of the third logical chain in the status attainment model. Having identified typical trajectories, this study then discusses how different work trajectories influence individuals' attainment of overall socioeconomic status and elite status. Overall socioeconomic status is measured by two continuous variables—the International Socio-Economic Index (ISEI) and income. Elite status is measured by three dichotomous variables—whether the observation has become a managerial elite under the managerial authority hierarchy, a technical elite under the technical authority hierarchy, or a self-employed private enterprise owner. All five dependent variables are constructed based on the primary or last job at the time of the survey. Multivariate linear regression and logistic regression models are applied.

Three groups of control variables are also included in the regression models. The first group contains demographic and socioeconomic characteristics, including sex (male = 1), age in 2012, party membership (party member = 1), residency (urban = 1), *hukou* status (agricultural = 1), region, and work cohort (pre-1978, 1978–1991, 1992–2000, post-2000, indicating the period of first entry into the labor market). The second group includes two human capital characteristics: years of schooling and a second-order polynomial of experience. The third group is family background, including parental education in years (highest of the two) and *hukou* status at birth (agricultural = 1).

Results

The overall distribution of work trajectories

The first analytical goal of this study is to identify typical work trajectories based on the 23 work states at each time point in the work year sequence. This study begins by obtaining a distribution of work state over all individuals in the first 12 years of their career paths. Figure 2[3] shows the job mobility matrix. Here, the columns (horizontal axis) of

[3] Limited by resolution, RGB values and grayscale values in typesetting, the author has not completely shown the detailed process by which sequence analysis identified the four typical trajectories, or relevant graph information (including "work organization characteristics of the four typical trajectories" and "occupational characteristics of the four typical trajectories"). Interested readers can contact the author to request supplementary information.

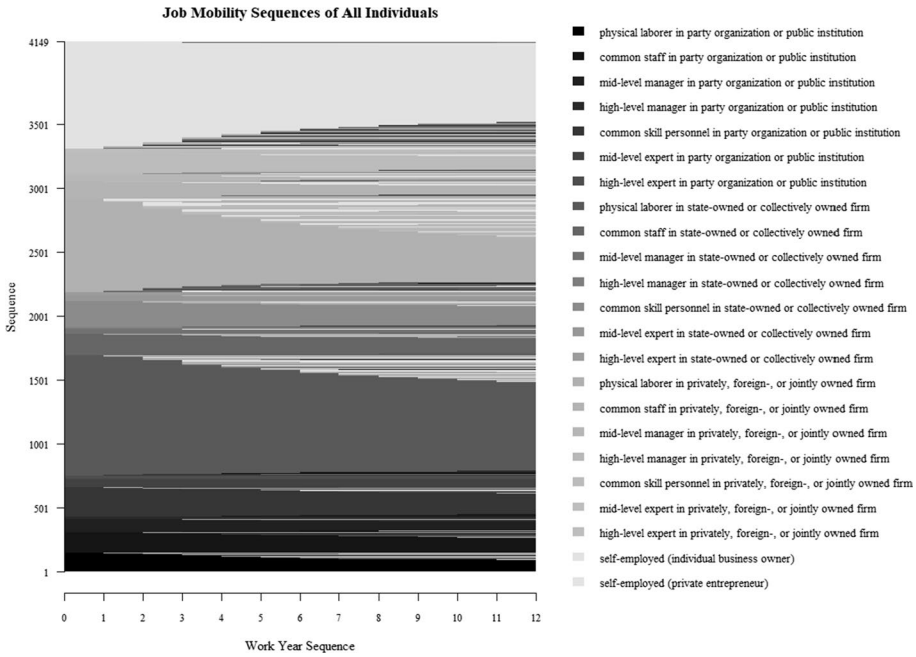

Fig. 2 Overall distribution of work trajectories

the job mobility matrix represent the time axis of the work year sequence, marking the work state at each of the 12-year points. The rows of the matrix (vertical axis) represent the sample, with each row of data representing one person's work trajectory. This matrix provides the basic data for subsequent analysis.

Based on the job mobility matrix, the author uses two indices provided by sequence analysis—average entropy and average turbulence—to measure the diversity and complexity of work trajectories and then discuss the general trend for different groups who entered the labor market at different times of market transition. Entropy and turbulence are two standard statistics provided by sequence analysis (Gabadinho et al. 2011). Entropy is used to measure the variation between different work trajectories, and it takes a value of 0 when every trajectory is exactly the same. The larger the entropy value, the more diverse work trajectories are within a group. Turbulence measures the heterogeneity between different states within each trajectory. The higher the turbulence is, the more complex the composition of the work trajectory is. Compared to traditional statistical indices, such as the average number of job changes or the percentage of individuals who change jobs, entropy and turbulence take into account the duration of each work state and the sequence in which job changes happen. By including this information in the calculation, they provide more efficient demonstrations of overall characteristics and group differences. This feature is one of the technical advantages of sequence analysis in investigating work trajectories.

Figure 3 shows the trend of change in work trajectories for different time periods during the market transition. The horizontal axis represents the cohort of first entry into the labor market, which includes four groups—pre-1978, 1978–1991, 1992–2000, and post-2000. In terms of diversity, in the early transition stage, with limited job mobility, the difference between individual work trajectories is small and insignificant. This finding

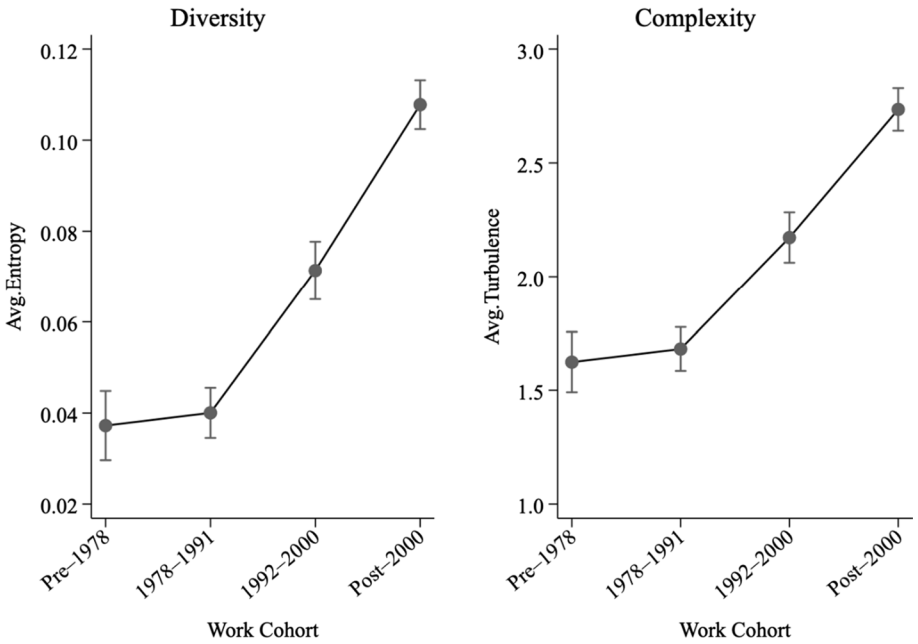

Fig. 3 Main features of work trajectories of different work cohorts

is consistent with the findings of previous studies (Zhou et al. 1997). However, as the market transition deepens, diversity increases considerably. The complexity of work trajectories also shows the same change trend. The deepening of market transition diversifies the economic sectors, division of labor, and occupation composition, increasing the complexity of career trajectories. This observation is also consistent with the historical change discussed in the previous sections.

Typical work trajectories

Building on the overall distribution of work trajectories, the author applies the clustering analysis provided in the sequence analysis to categorize work trajectories based on the similarity of sequences. According to the principles of simplicity and accuracy, the author identifies four typical trajectories, as shown in Fig. 4. Considering the distribution of individual work sequences in each typical trajectory, one can observe how individual work trajectories are categorized overall. Thus, the sociological meaning behind the trajectories can be summarized, and the four trajectories can be distinguished according to the main characteristics of the three dimensions—employment status, organizational type, and work position. The author now refers to the four typical trajectories as Trajectories 1, 2, 3, and 4 for the moment. In the following, the main characteristics of these typical trajectories will be discussed, respectively.

First, based on the detailed composition of work states in the four typical trajectories, Trajectory 1 has the richest composition, where the vast majority of work sequences consist of job changes between multiple work states. Trajectories 2 and 4 are more concentrated. Trajectory 2 consists mostly of physical labor in the private sector. The majority of individuals have been hired by private organizations, but some have also switched to the private sector from state-owned and collectively owned businesses or individual businesses. Other individuals made the reverse change, from the private sector to

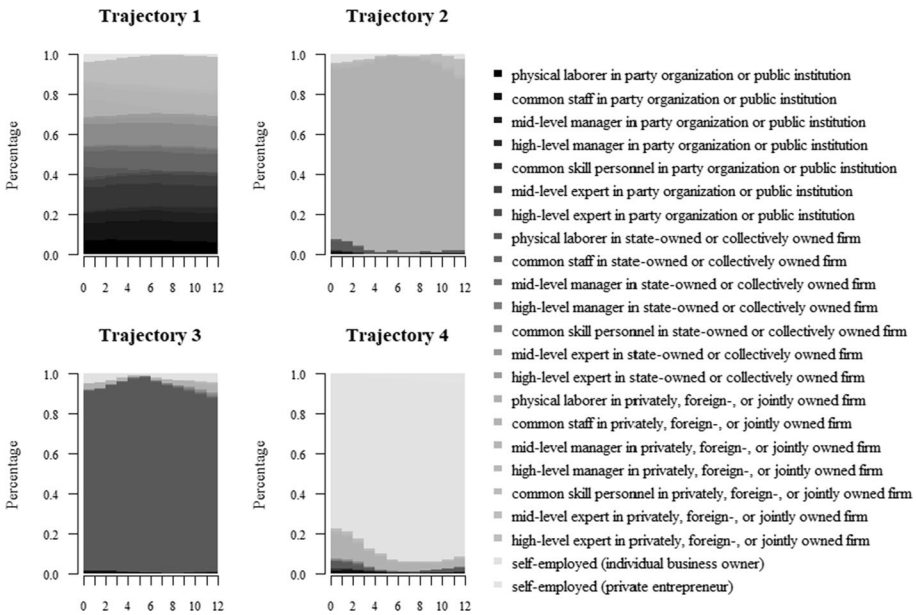

Fig. 4 Four typical work trajectories

individual businesses. Trajectory 3 consists mostly of physical labor in the state- or collectively owned businesses, with some bilateral mobility between state-owned and individual businesses or between physical labor in state-owned and individual businesses. Trajectory 4 is made of mostly self-employed trajectories, including job changes from the state-owned sector to the self-employed sector and a small amount of two-way mobility between the private sector and individual businesses.

Second, when examining the characteristics of the four trajectories based on the dimension of organizational type, Trajectory 1 consists of three organizational types—party/political agencies and public institutions, state-owned or collectively owned businesses, and the private sector. Therefore, organizational type is not the driving dimension in the clustering of Trajectory 1. Trajectories 2 and 3, on the other hand, have very clear distributions by organizational type, predominated by the private sector and state-owned (and collective) businesses, respectively. Trajectory 4 is mostly self-employed.

Third, based on dimensions of employment status and work position, Trajectory 1 consists mostly of job mobility among common staff in the authority hierarchy. For example, some individuals move from common staff to mid- or high-level managers or from common skill personnel to mid- or high-level experts. Trajectories 2 and 3 contain mostly physical labor. Trajectory 4 contains mostly individual businesses but also a large number of sequences featuring changes from other jobs to individual business owners and vice versa.

To summarize, the main driving dimension of Trajectory 1 is the work position in the authority system. The author terms this trajectory as the "merit-based work trajectory." The clustering dimensions of Trajectories 2 and 3 are work organization type and physical/nonphysical division. These two trajectories are termed the "blue-collar's work

Table 1 Main group characteristics of the four typical work trajectories ($N = 4149$)

Variable	Trajectory 1 Merit-based trajectory	Trajectory 2 Private blue-collar trajectory	Trajectory 3 State-owned blue-collar trajectory	Trajectory 4 Self-employed trajectory	Total
Male (%)	51.09	42.83	47.66	50.93	49.31
Age (years)	40.02	35.15	49.07	38.49	41.05
Urban residence (%)	0.89	0.82	0.92	0.73	0.85
Agricultural hukou (%)	16.81	44.22	9.26	51.81	26.2
Education (years)	12.83	10.58	10.33	9.63	11.32
Work age (years)	14.62	10.43	20.03	13.03	14.93
Party member (%)	29.05	3.39	11.94	3.83	16.7
Parental education (years)	8.73	7.94	6.83	7.08	7.86
Agricultural hukou at birth (%)	50.6	67.13	36.72	79.85	56.04
Work cohort (%)					
Pre-1978	39.6	2.14	42.66	15.6	15.76
1978–1991	37.35	7.95	34.7	20	30.01
1992–2000	45.88	15.72	14.01	24.39	22.54
Post-2000	52.09	18.4	4.11	25.4	31.69
Average entropy	0.08	0.06	0.04	0.07	0.07
Average turbulence	2.34	1.86	1.77	2.15	2.12
Average number of job changes	0.51	0.41	0.27	0.46	0.43
%	44.3	12.1	21.6	22.01	100

trajectory in the private sector" and "blue-collar's work trajectory in state-owned enterprises," respectively. Trajectory 4 is dominated by employment status and is thus termed the "self-employed trajectory."

Table 1 demonstrates the group characteristics of the four typical work trajectories. First, people with a merit-based work trajectory have the highest average education level, a higher percentage of party membership, and a more privileged family background. Second, the group with the blue-collar work trajectory in the private sector is younger, with fewer party members. As the market transition progresses, this group occupies an increasingly higher percentage. Third, people with blue-collar work trajectories in state-owned enterprises are on average older and have more work experience and a higher percentage of party members. The percentage decreases with privatization by work cohort. Fourth, individuals with the self-employed trajectory have the lowest education level, a less advantaged family background, and a high percentage of agricultural *hukou* status. The most diverse and complex trajectory, with the highest degree of within-group mobility, is the merit-based work trajectory. The next most diverse and complex trajectory is the self-employed trajectory, followed by the blue-collar's work trajectory in the private sector and the blue-collar's work trajectory in state-owned enterprises. In conclusion, groups with these four work trajectories have relatively different socioeconomic and demographic characteristics, indicating that the four typical trajectories obtained from sequence analysis well distinguish the individuals in China's urban labor market.

Status attainment

Based on the typical trajectories and group differences in each typical trajectory, the second goal of this study is to investigate how different work trajectories affect individuals' attainment of overall status (income and ISEI) and elite status (whether they finally become managerial or technical elites or entrepreneurs), controlling for sociodemographic characteristics, human capital, political resources, and family background. The results are given in Table 2.

The first is overall status attainment. The results are shown in the first two columns of Table 2 using the merit-based work trajectory as the baseline category for comparison. Holding other characteristics fixed, human capital variables such as education and experience have significant effects, while work trajectories are insignificant. The merit-based work trajectory has a higher effect on income than the state-owned blue-collar trajectory. The merit-based work trajectory also leads to a higher ISEI, while both the private and the state-owned blue-collar trajectories are associated with a lower ISEI. Moreover, education and political capital both have significant effects on the ISEI. In summary, for overall status, work trajectories mainly affect ISEI attainment, while individual income differences are shaped mainly by human capital factors.

The second is the attainment of elite status. Controlling for other characteristics, the merit-based work trajectory significantly increases the odds of becoming a managerial elite. The private blue-collar and self-employed trajectories are associated with disadvantages in becoming managerial elites, while the state-owned blue-collar trajectory has the smallest disadvantage. These findings suggest that job mobility within the authority hierarchy is key to becoming managerial elites, and being involved in state-owned businesses also helps. Notably, party membership, a key control variable of political capital, has a significant positive effect on the attainment of managerial elite status. The merit-based work trajectory also significantly increases the odds of achieving technical elite status, while the difference between the effects of the private blue-collar trajectory and the merit-based work trajectory is statistically insignificant. These findings suggest diverse ways to achieve technical elite status, which does not rely too much on work organization type. The state-owned blue-collar trajectory provides a slight disadvantage in technical elite status attainment, while the self-employed trajectory provides the greatest disadvantage. For entrepreneurs, the private blue-collar and the self-employed trajectories have significant positive effects. The effect of the self-employed trajectory is especially large. In contrast, the merit-based and state-owned blue-collar trajectories do not help achieve entrepreneur status. These findings are consistent with common empirical observation, as the self-employed trajectory implicates a gradual attainment of enterprise ownership, which is necessary to become an entrepreneur.

Derived from Table 2, Fig. 5 more intuitively shows the comparison between the four typical trajectories in terms of their different effects on status attainment. To summarize, the four typical trajectories have significant explanatory power for attaining overall socioeconomic status. ISEIs obtained under four work trajectories are systematically different. Compared to the state-owned blue-collar trajectory, the self-employed trajectory significantly improves income. Meanwhile, the four typical trajectories effectively explain how the differentiation of individuals in career paths influences their attainment of elite status. The merit-based trajectory helps individuals become managerial elites,

Table 2 Effect of different work trajectories on status attainment

	Overall status		Elite status		
	Log of income	ISEI	Managerial elite	Technical elite	Entrepreneur
Work trajectory					
(Baseline: Merit-based Trajectory)					
Private Blue-Collar Trajectory	− 0.008	− 5.847***	− 1.283**	− 0.202	1.062*
	(0.106)	(0.795)	(0.433)	(0.331)	(0.537)
State-Owned Blue-Collar Trajectory	− 0.170†	− 6.947***	− 1.077***	− 0.603*	0.41
	(0.102)	(0.770)	(0.260)	(0.255)	(0.613)
Self-Employed Trajectory	0.137	− 0.31	− 1.862***	− 2.415***	3.490***
	(0.092)	(0.691)	(0.438)	(0.730)	(0.381)
Sociodemographic characteristics					
Gender (Baseline: Female)	0.481***	− 2.091***	0.469**	0.684***	0.848***
	(0.066)	(0.492)	(0.161)	(0.189)	(0.227)
Age	0.017**	0.062	− 0.006	− 0.006	0.02
	(0.006)	(0.044)	(0.016)	(0.020)	(0.019)
Residency (Baseline: Rural)	0.059	− 0.018	− 0.255	0.449	1.069**
	(0.098)	(0.722)	(0.257)	(0.372)	(0.361)
Hukou (Baseline: Nonagricultural)	0.049	− 2.946***	− 0.623†	− 0.666	0.159
	(0.097)	(0.720)	(0.320)	(0.417)	(0.281)
Human capital					
Years of schooling	0.120***	1.787***	0.113***	0.183***	0.181***
	(0.013)	(0.098)	(0.032)	(0.039)	(0.044)
Experience	0.062***	− 0.055	0.032	0.033	0.041
	(0.012)	(0.088)	(0.030)	(0.035)	(0.049)
Squared experience	− 0.001***	0	− 0.001	0	− 0.002
	(0.000)	(0.002)	(0.001)	(0.001)	(0.002)
Political capital					
Political identity	0.029	2.736***	1.146***	− 0.125	− 0.466
(Baseline: Nonparty member)	(0.093)	(0.698)	(0.168)	(0.216)	(0.467)
Family background					
Parents' years of schooling	0.018*	0.092	0.029	0	− 0.027
	(0.009)	(0.066)	(0.019)	(0.022)	(0.031)
Hukou at birth	0.132	2.603***	0.429*	0.04	− 0.163
(Baseline: Nonagricultural)	(0.082)	(0.613)	(0.176)	(0.207)	(0.286)
Work cohort (Baseline: Pre-1978)					
1978–1991	0.033	− 3.523**	0.945**	1.068**	1.660*
	(0.167)	(1.278)	(0.350)	(0.415)	(0.790)
1992–2000	0.188	− 3.729*	0.372	1.067†	1.983*
	(0.203)	(1.546)	(0.471)	(0.571)	(0.856)
Post-2000	0.221	− 5.545**	0.178	0.306	1.877*
	(0.227)	(1.712)	(0.561)	(0.707)	(0.923)
Regional Fixed Effects	Yes	Yes	Yes	Yes	Yes
Intercept	6.802***	29.052***	− 4.943***	− 7.265***	− 13.305***
	(0.436)	(3.279)	(1.099)	(1.374)	(1.840)
N	3091	2918	4149	4149	4149

(1) Standard errors are in parentheses

(2) † $P < 0.1$,* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

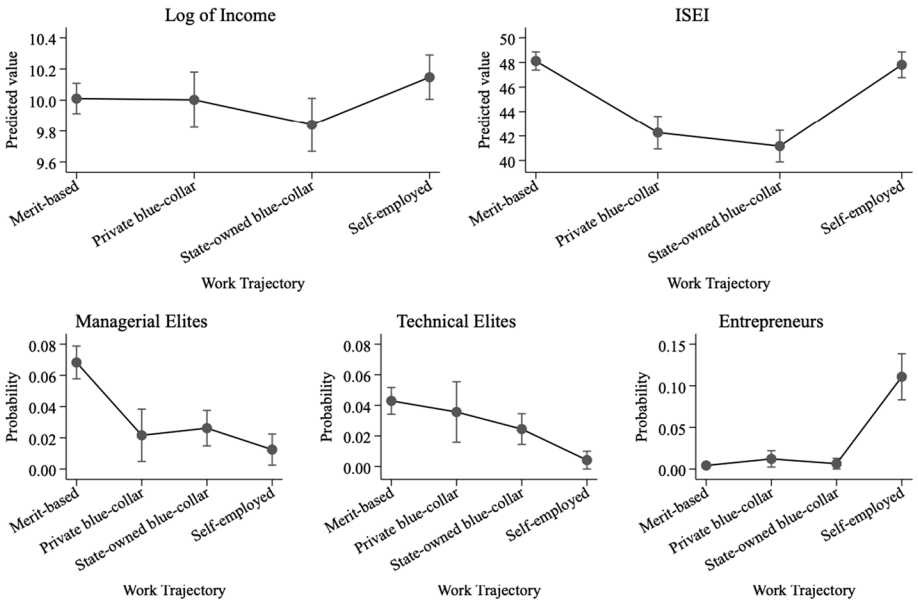

Fig. 5 Relative effects of the four typical work trajectories on status attainment

while the self-employed trajectory helps them become entrepreneurs. For technical elites, however, there are more diverse attainment routes.

In conclusion, the four typical work trajectories have heterogeneous effects on the attainment of overall status and elite status. On the one hand, this observation illustrates that different work trajectories shape individual career paths and thereby affect their status attainment. These findings provide a possible explanation for the third chain of the Blau–Duncan status attainment model. On the other hand, the findings suggest the representativeness of the four typical patterns, showing that sequence analysis methods effectively summarize and distinguish the main characteristics of work trajectories in the contemporary Chinese labor market and their effects on social stratification.

Conclusion and discussion

Previous research has made efforts to examine the third mechanism chain in the Blau–Duncan status attainment model, i.e., how within-career job mobility affects individuals' socioeconomic status. Based on previous attempts, this study focuses on the cumulative effect of job mobility, namely, the "work trajectories," to advance research theoretically and empirically. Using sequence analysis, this study describes the overall distribution and typical types of work trajectories in China's urban labor market and then analyzes the effect of different work trajectories on individuals' attainment of overall and elite statuses.

As the market transition deepens, work trajectories in China's urban labor market are becoming increasingly diverse and complex. Cross-sectional discussions of single-time job change events and their effects are limited by factors such as when the survey was conducted, the individual's life course, and previous job change experiences. These factors reduce the robustness of such studies. On the one hand, they may underestimate the effect of intragenerational mobility; on the other hand, they may also overestimate the

level of intergenerational mobility (Jarvis and Song 2017). This study focuses on work trajectories shaped by sequential job changes, providing new insight into patterns of intragenerational mobility and the process by which individuals attain status and social groups structurally stratify. Sequence analysis provides an advantageous analytical tool for examining work trajectories.

To conceptualize job mobility and work trajectories, this study proposes three dimensions—employment status, organizational type, and work position. Using sequence analysis, four typical work trajectories distributed in China's urban labor market are identified from work history data—the merit-based work trajectory, the private blue-collar trajectory, the state-owned blue-collar trajectory, and the self-employed trajectory. This study finds that, on the one hand, organizational types and job changes across different work organizations have significantly shaped individual career paths. Both the private blue-collar trajectory and the state-owned blue-collar trajectory highlight the important role played by organizational types, which means that the market transition has not reduced the effect of work organizations as a mechanism of organizational inequality (Li et al. 2006; Xie 2010). On the other hand, cross-organizational job mobility cannot distinguish different career paths unless combined with specific work positions. Relatively speaking, the physical/nonphysical divide is more critical than the managerial/technical divide in shaping work trajectories. Physical laborers are categorized into either the private blue-collar trajectory or the state-owned blue-collar trajectory based on organizational types. However, all nonphysical laborers are grouped into the merit-based work trajectory, regardless of the authority hierarchy (managerial or technical) in which they are embedded. As such, the merit-based work trajectory highlights vertical job mobility and is not overly restricted to horizontal limitations in terms of work organization and ownership type. These findings suggest the conditional effect of work organization and ownership types on mainly physical workers. The implication is that the rights of blue-collar workers need to be protected at the institutional level by reducing barriers to job mobility. Finally, the self-employed work state differs from the states in the other three work trajectories in terms of employment relations and work characteristics, shaping an important category of the career path—the self-employed trajectory.

Different work trajectories generate heterogeneous socioeconomic consequences. The findings of this study provide a substantive explanation and test for the third mechanism chain of the status attainment model—how within-career job mobility affects individuals' socioeconomic status. By applying different measures of socioeconomic status, this study examines different facets of status attainment. This examination is especially necessary now when socioeconomic status is increasingly differentiated. While income emphasizes economic status, the ISEI reflects overall social status, especially occupational status. The elite status measure is yet different, emphasizing authority relations and hierarchy. The merit-based work trajectory increases the ISEI and probability of becoming managerial or technical elites. The self-employed trajectory increases both the ISEI and income and paves the road to entrepreneurship. The state-owned blue-collar trajectory has a relatively low payoff. The private blue-collar trajectory has a comparatively higher chance of becoming a technical elite. There are diverse paths to becoming a technical elite, but the self-employed pattern shows a significant disadvantage on this front. As such, since the market transition, different work trajectories have shown

different cumulative effects on the attainment of elite status. This study finds that even after controlling for sociodemographic factors, work trajectories still have significant effects on obtaining overall and elite social status, reflecting the cumulative effect of career mobility. In particular, the ISEI and elite status (managerial or technical) are more constrained by the work position dimension of job mobility, while income and entrepreneur status are more constrained by employment status. Although organizational type is helpful in clustering work trajectories, it does not bring heterogeneous effects on individual status attainment unless combined with the specific work position of a given job.

Through a sequence analysis of job mobility in the labor market, this study examines how work trajectories affect individual status attainment, providing a longitudinal and sequential perspective to obtain a deeper understanding of the intragenerational mobility pattern and social stratification process in contemporary China. With the increasing availability of panel data on work history, future research can use this analytical perspective and sequence analysis methods to extend analyses of intragenerational mobility further and thereby examine work trajectories in the post-transition era and their effects on social inequality.

Abbreviations

SEI	Socioeconomic index
DNA	Deoxyribonucleic acid
CLDS	China Labor Force Dynamic Survey
ISEI	International Socio-Economic Index

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