

L I V E S
W O R K I N G
P A P E R
2 0 1 4 / 3 0

TITLE

Social origins and post-high
school institutional
pathways:
A cumulative dis/advantage
approach

Research paper

Authors

Francesco Giudici
Aaron M. Pallas

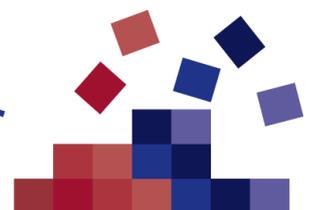
<http://dx.doi.org/10.12682/lives.2296-1658.2014.30>
ISSN 2296-1658

FNSNF

SWISS NATIONAL SCIENCE FOUNDATION

The National Centres of Competence in Research
(NCCR) are a research instrument of the Swiss
National Science Foundation.

LIVES



Swiss National Centre of Competence in Research

Authors

Giudici, F. (1)

Pallas, A. (2)

Abstract

The social stratification that takes place during the transition out of high school is traditionally explained with theoretical frameworks such as status attainment and social reproduction. In our paper, we suggest the cumulative dis/advantage hypothesis as an alternative theoretical and empirical approach that explains this divergence in institutional pathways as the result of the dynamic interplay between social institutions (in our case, schools) and individuals' resources.

We use data from the NLSY79 in order to compute institutional pathways (defined by educational and occupational status) of 9200 high school graduates. Optimal Matching Analysis and Cluster Analysis generated a typology of life course pathways. Our results show that both ascribed characteristics and students' high school characteristics and resources are predictors of post-high school pathways.

Keywords

Transition out of high school | Life course pathways | Cumulative dis/advantage hypothesis | sociology of education

Author's affiliation

(1) (2) Teachers College, Columbia University

Correspondence to

francesco.giudici2@gmail.com

** LIVES Working Papers is a work-in-progress online series. Each paper receives only limited review. Authors are responsible for the presentation of facts and for the opinions expressed therein, which do not necessarily reflect those of the Swiss National Competence Center in Research LIVES.*

*** A similar version of this Working Paper has been published in *Social Science Research*, (2014) 44. It can be accessed at <http://www.sciencedirect.com/science/article/pii/S0049089X13001580#>. Please cite the journal article.*

1. Introduction

The transition out of high school into the early institutional career is often studied over short time periods and with outcomes in a single institutional domain, centered exclusively on educational or occupational attainment. In the U.S. and elsewhere, however, life course pathways and the individual choices that shape them have to be understood as reciprocal and dynamic (Elder Johnson, & Crosnoe., 2003). The transition out of high school is an important moment of biographical orientation (Heinz, 1999), a time where multiple resources (e.g., economic, cultural and social) and multiple actors (e.g., family, friends and institutional actors) interact with one another. Attention to these resources and actors could inform a sociological understanding of the differentiation that occurs in the educational and the occupational pathways of young adults following their graduation from high school.

Although there is great interest in describing educational and occupational pathways, as a practical matter, the theories and data which have been applied to the post-high school career are frequently based on cross-sectional observations of socioeconomic outcomes, such as the highest level of schooling completed, occupational prestige of the current job, or current income. Empirical studies relying on the status attainment model and social reproduction theory typically offer a static view of how individuals engage with social institutions after graduation from high school. That is, they do not consider institutional change and the dynamic interaction between individuals and institutions, focusing only on the structuring power of social structures on individuals (Dannefer, 2003). A different approach can be proposed, in which social differentiation is explained as both the result of inequalities in individual-level and institutional-level factors. Tracing the experiences of a cohort of American youth as they move beyond high school into the adult worlds of postsecondary education and employment may shed new light on the dynamic interplay of individuals and institutions. We propose the Cumulative Dis/Advantage Hypothesis as a new theoretical framework that could help explain how individual and institutional inequalities work together to differentiate the institutional careers of young adults. We aim to illustrate how CDA can lead to a different empirical approach and interpretation of life course patterns.

1.1. Theoretical Background

Two important research traditions have examined the life experiences of young men and women in the years following high school. The status attainment tradition, which is associated with the signal work of Peter Blau and Otis Dudley Duncan (Blau & Duncan, 1967) and William H. Sewell and Robert Hauser (Sewell, Haller & Portes, 1969; Sewell, Haller & Ohlendorf, 1970; Sewell & Hauser, 1975;

Sewell, Hauser, Springer & Hauser, 2001), transformed the study of social mobility in three ways. First, socioeconomic attainment, which had been represented solely as social class membership in an earlier era of social mobility research, was reconceptualized as a continuous measure of occupational status or prestige which could be regressed on similar measures of social origins to summarize the extent of the inheritance of one's social position. Second, such a reframing invited the application of path analysis, and later structural equations modeling, to test the particular mechanisms which might account for the substantial effect of social origins on socioeconomic outcomes. And finally, the distinctive approach of Sewell and his colleagues emphasized social-psychological mechanisms such as individual aspirations and expectations, and social influences on these self-appraisals and values, as factors mediating the link between origins and outcomes. The status attainment model became more elaborate over time, as Kerckhoff (1976, 1993) and others introduced structural constraints and contingencies into the model, and focused on specific transitions from one level of schooling to the next, from school to work, or from one job to the next.

The second research tradition, social reproduction theory, has emphasized the ways in which social institutions such as the educational system contribute to the intergenerational maintenance of power and privilege. This theory, associated with scholars such as Pierre Bourdieu (1973), identifies schooling as a key site in the struggle for advantage. Schools, in this view, are important gatekeeping mechanisms for sorting and excluding individuals based on their stocks of economic, social and cultural capital. The playing field governing access to high-status schools is not level, as these schools admit students who enter with social and economic advantages, and channel them toward desirable educational and occupational destinations.

The literatures on school effects and on the expansion of the education system have some affinities to social reproduction theory, although authors do not always make such a connection. Within the status attainment literature, researchers have documented that there are school effects on academic and socioeconomic outcomes, with students who attend some high schools having better outcomes than students who attend other schools (Hauser, Sewell & Alwin, 1976). The genealogy of school effects research typically is traced back to *Equality of Educational Opportunity* (Coleman et al., 1966), which found that although family background swamped the measurable features of schools in predicting children's performance on standardized tests, a school's student-body composition was a persistent influence: all children benefited from attending school with a concentration of middle-class peers, and poor and minority children were especially sensitive to the school's peer composition. Borman and Dowling's (2010) reanalysis of the *EEO* data using more modern methods found even more variation

among schools in student performance than Coleman reported, and an even greater effect of going to school with middle-class classmates.

A different strain of research has suggested that education expands in ways that enable dominant groups to maintain their social advantages. This is the message of Raftery and Hout's (1993) influential article explaining how class advantages were maintained in Ireland even as educational attainment expanded. Maximally-maintained inequality was the phrase they used to describe a pattern in which the association between social class and transition rates from one level of education to the next remains constant until a given level of education is nearly universal, at which point the struggle for class advantage shifts to the next highest level of schooling. Lucas (2001) extended Raftery and Hout's description to incorporate stratified positions *within* a given level of schooling, such as high-school track placement, or attending a postsecondary institution which is either highly selective or non-selective, labeling the phenomenon "effectively-maintained inequality." More so than Raftery and Hout, Lucas introduced class interests into the mechanisms by which individuals are allocated into different horizontally-differentiated positions within the education system.

Although Raftery and Hout (1993) and Lucas (2001) studied educational transitions, and educational transitions are an important component of the sociology of the life course's concern with the timing and sequencing of social role transitions, for the most part there has been little conversation between the literatures on educational stratification and the life course. Whereas Raftery, Hout and Lucas speculate that the influence of class origins might vary across educational transitions as parent-child bonds weaken over the child's life course, it is much more common for the status attainment and educational stratification literatures to attend to educational and occupational outcomes that are treated as static life course destinations (Abbott, 2001).

1.2. The Cumulative Dis/Advantage Hypothesis

We believe that an emergent perspective within the sociology of the life course, the cumulative dis/advantage (CDA) hypothesis, can serve as a bridge among theories of social reproduction, status attainment, and the transition to adulthood. Theories of social reproduction often give short shrift to the interactions between actors and institutions, and the joint influence of biography and social and historical change. The mechanisms by which schools might affect the timing and sequencing of events in individuals' lives receive little attention, especially if they are not closely connected to class position. Our approach seeks to incorporate a broader approach to the mechanisms which generate inequalities in the life course of individuals.

The CDA hypothesis was first proposed by Merton (1973, 1988) to describe a mechanism for allocating social rewards that increases the recognition of established scientists compared to others who “have not yet made their mark” (1973, p. 466). The simplest definition of the CDA hypothesis is formulated by Dannefer (2003), who states that the CDA hypothesis is confirmed when there is “a systematic tendency for interindividual divergence in a given characteristic (e.g. money, health, status) with the passage of time” (p. 327).

In contemporary empirical research, the association between the CDA hypothesis and the life course paradigm has inspired empirical studies of social inequality over the life course which show how initial inequalities in a socially-valued characteristic (such as socioeconomic status during working life) produce even greater inequalities over time in the same or another characteristic (such as health). A series of recent contributions in this stream finds support for the CDA hypothesis by considering large spans of life, for example with respect to the influence of socioeconomic status on physical and mental health among older people (Ferraro & Kelley-Moore, 2003; Ferraro & Shippee, 2009, Willson, Shuey, & Elder, 2007; Ross & Wu, 1996), and on precursors to health problems, such as depression symptoms (Miech & Shanahan, 2000), disability (Taylor, 2010), and obesity (Ferraro & Kelley-Moore, 2003).

In empirical research, however, this hypothesis remains limited to the study of inequalities in specific dimensions of the life course, mainly related to income and health. The CDA hypothesis assumes that initial inequalities in the early life course lead to growing divergences in social positions which lead to differential socioeconomic rewards later in the life course. Based on this hypothesis, we can then assume that ascribed characteristics, such as social class origins, race/ethnicity and sex, play an important role in the choice of high schools which might differ in their resources, and that these high school resources might explain the effects of social origins on variations in institutional careers after high school. High schools, in this perspective, play a fundamental and additional role, independently of the effect of social origins, sex and race, in the determination of the pathways that individuals will follow after graduation. This model, based on the CDA hypothesis, proposes to estimate the mechanism for the production of cumulative inequalities across the life course, where the dynamic interaction between actors and institutions is central to understanding individuals' objective future trajectories and the subjective motivations that lead to them. In other words, the CDA hypothesis takes into account the aging of a cohort as a process producing social stratification, whereas the other theories offer a model which is static and deterministic.

1.3. The Transition out of High School

The transition out of high school is a moment of strong emotional intensity for youth. High school graduates face an increasing number of choices in their lives as they navigate the institutions of education, work and family. The concept of biographical orientation, proposed by Heinz (1999), describes the importance of the transition out of high school for decisions about the length and type of postsecondary education, the timing and sequencing of entry into paid work as a primary activity, and the ways young people will organize their family arrangements. Most studies that consider transitions at the end of high school focus explicitly on the transition to college (Deil-Amen & Turley, 2007), with a focus on postsecondary persistence and attainment. The literature is quite consistent with the CDA hypothesis: students who have more advantaged backgrounds, in terms of their stocks of social, cultural and economic capital, are more likely to attend four-year institutions than two-year institutions, and within these institutional types, more selective and prestigious institutions. This literature underlines also as socioeconomic advantages are associated with a greater likelihood of attaining postsecondary credentials. These post-high school educational advantages position young people for more prestigious and lucrative jobs in the labor market.

Social class background is also implicated in the ability of students to afford college, and the probability that they will work while enrolled in school. The literature on working during high school has considered the possibility that intensive work engagement (i.e., more than 20 hours per week) has an adverse effect on high school grades and other academic outcomes, but it is difficult to disentangle the causal relations between poor academic performance and intensive work involvement, as each could be a response to the other (Warren, 2002; Staff, Schulenberg & Bachman, 2010). Much of the association between working long hours and poor academic performance in high school may be due to their common dependence on prior measures of social background and school achievement (Schoenhals, Tienda & Schneider, 1998; Warren, LePore & Mare 2000).

Whether or not high-intensity work involvement results in poor academic performance in high school, it is worth exploring whether there are distinctive configurations of work and post-secondary enrollment among high school graduates. The origins of these configurations in the adolescent employment literature emphasized the "zero-sum" hypothesis, which assumed that the total amount of time which could be apportioned between paid employment and schoolwork was fixed, such that increasing the intensity of work involvement would necessarily reduce the time devoted to school, and thus heighten the risk of academic failure (Warren, 2002). But Warren (2002) proposed that it was more

profitable to think of a social-psychological mechanism in which either the worker role or the student role assumed primacy.

In U.S. high schools, there is really no such thing as a part-time student; but in postsecondary schooling, the full-time vs. part-time distinction is quite common, with approximately 40% of all postsecondary students enrolled on a part-time basis. Although the long-term consequences of variations in postsecondary school and work configurations remain to be explored, it is reasonable to hypothesize that some configurations—especially those which might lead to receipt of a four-year college degree or an advanced degree—will be associated with better adult socioeconomic outcomes than others. There is, then, some intrinsic interest in understanding the distribution of these configurations, and how they might vary among individuals of different social backgrounds. This is especially true in the U.S. context, where young adults have been described as "floundering" or subject to instability in the years which follow high school graduation (Namboodiri, 1987; Arnett, 2004).

The preceding text uses the term "configurations," indicating a two-dimensional space locating an individual in relation to the intensity of postsecondary schooling (i.e., none, part-time, and full-time) and work (i.e., none, part-time and full-time); but the term "configuration" does not acknowledge that individuals traverse schooling and work pathways—well-traveled sequences of positions in each domain which vary over time in their quantitative and qualitative attributes (Pallas, 2003). A cross-sectional status measure of educational or occupational participation runs the risk of measurement error; an individual's status in March might differ from his or her status in February or April. Taking into account a series of positions across months would reduce the unreliability in a measure relying on a snapshot of an individual's position in one particular month. More importantly, though, a pathway is not simply the modal value of the positions that are observed over a chronological time period. Rather, pathways involve a sequence of positions, and indicate rates of change in an individual's role enactments that are durable and predictable.

Although life-course methods have long sought to model transitions, turning points and trajectories (Pallas, 2003), dating at least as far back as Hogan's (1978) efforts to examine the life-course consequences of variations in the ordering of events in the transition to adulthood, the field received a boost with the advent of more sophisticated methods of classifying trajectories and pathways. Abbott (2001) suggested the promise of optimal matching techniques for classifying careers into an identifiable number of categories, based on the similarities in the sequence of career events. Similarly, Macmillan and Eliason (2003) have proposed and relied upon a two-stage latent class analysis to model variations in social-psychological outcomes associated with multifaceted life course pathways. The use of optimal

matching in classifying high school graduates into one of several categories is supported by Barban and Billari's (2012) simulations, which suggest that optimal matching may be more successful than latent class analysis at recovering the true pathways when the variation within a group is due to sequencing and timing, rather than random variation—although the differences between the two methods are not large.

1.4. The Role of High School Resources

The CDA hypothesis also draws attention to the mechanisms by which social origins might shape postsecondary enrollment and work configurations. In this paper we focus specifically on the unequal access to high school resources as a mediating factor. Whereas models of the college application and enrollment process routinely take into account class-linked inequalities in family information about college, and the sheer financial challenges experienced by low-income families, there is reason to think that attending a high school rich in resources might offset some of these social background disadvantages. Roderick, Nagaoka and Coca (2011) show that first-generation college students are especially dependent on high school resources, as indicated by the presence of a "college-going climate" and the institutionalization of information about college application and financial aid application processes. Hill (2008) also demonstrates that high school organization—specifically, the "college-linking" strategies adopted by high schools—are associated with variations in postsecondary enrollment patterns. Although our data do not allow us to tailor our measures of high school resources to the college-going process in the way that these researchers have done, there nevertheless are variations in less-specific resources—the composition of the student body, which may signal the academic orientation or press in the high school, and high school staffing levels, which may indicate the availability of information about college and/or the intensity of staff-student interaction—which are associated with the social backgrounds of the students who attend one high school versus another.

2. Hypotheses

Our approach leads us to believe that it is important to consider the divergences in institutional pathways following the transition out of high school. Attention to the timing and sequencing of post-high school schooling and employment will provide new evidence on the relative influence of individual and institutional factors in shaping these institutional pathways, while side-stepping challenging questions about the causal effect of a schooling pathway on an occupational pathway, and vice versa.

Instead, we assume that specific configurations of work and schooling in the life course pathways that follow high school graduation are associated with both ascribed social characteristics, such as sex, race, and socioeconomic origins, and the resources located in the high school a youth attended. By relying on optimal matching to identify distinctive institutional pathways, and regressing the variation in these patterns on social background characteristics and high school resources, we will generate new insights into the nature of CDA, and the mechanisms by which individuals' pathways diverge over time. We hypothesize that more advantaged social backgrounds will be associated with pathways which involve more intensive postsecondary schooling, compared to pathways which involve less schooling and varying levels of post-secondary labor force participation. Similarly, attending a resource-rich high school also will be associated with the likelihood of an intensive postsecondary schooling pathway, and will partially mediate the influence of social origins on the post-high school institutional pathway.

3. Data and Measures

The data that we consider are from the National Longitudinal Survey of Youth 1979 (NLSY79). This survey is a longitudinal panel composed of 12,686 individuals living in the United-States aged 14-21 at the time of the first interview in 1979. The same individuals have been interviewed repeatedly through 2008. We selected from this sample all the individuals that completed and obtained a regular high school diploma (thereby excluding GED recipients).

3.1. Institutional Pathways

Our dependent variable is the institutional life course pathway which follows high school graduation, based on the location of an individual in the education system and the economy. We classified individuals' life course pathways based on their educational and occupational status for each of the 60 months following their graduation from high school, relying on the beginning and ending months of various enrollment and employment spells, and respondents' reports about the intensity of these spells (i.e., part-time or full-time). Thus, the pathways we analyze represent a pattern of participation observed over a five-year period, and not simply a status recorded as of a particular age, as is customary in these types of analysis (Gauthier, 2007). Sequences of educational and occupational statuses were assembled by collecting information starting retrospectively from the first Wave in 1979, and then prospectively with the following annual Waves. When a single monthly status was missing in a given wave, it was supplied via retrospective data from later waves.

Specifically, we rely on respondents' reports of enrollment spells in postsecondary education programs, and whether they are part-time or full-time, to classify an individual as enrolled full-time, enrolled part-time, or not enrolled during each of the 60 months following high school graduation. For the data on paid work, we use the start date, end date and number of hours worked per week for the first three occupations identified by respondents, and sum the total weekly hours of paid work. Total occupational time per week was then recoded into not working, working part-time (from 1 to 30 hours per week) and working full-time (31 hours per week and more) for each month. These monthly educational and occupational statuses were combined to create nine distinct institutional configurations for each of the 60 months: (1) studying full-time and not working; (2) enrolled full-time and working part-time; (3) enrolled full-time and working full-time; (4) enrolled part-time and not working; (5) enrolled part-time and working part-time; (6) enrolled part-time and working full-time; (7) not enrolled and not working; (8) not enrolled and working part-time; and (9) not enrolled and working full-time. We were able to assemble sequences of these configurations for 9,200 members of the NLSY79 panel.

3.2. School Characteristics

Because the NLSY79 was not a school-based study, the available data on school resources are not as extensive as in some other studies. Nevertheless, we have some direct information on the high school in which respondents were enrolled, rather than relying on aggregate data for the school's State of residence, as some other studies do (cf. Betts, 1995). We identify some variables which describe the resources and the academic climate of the last high school attended by study participants. During 1980-83, high school transcript information was collected for 8,778 civilian members of the NLSY79 sample who were 17 years of age or older and who were expected to complete high school within the United States. School administrators reported on the school resources available in the high schools attended by these youth. We factor-analyzed six school resource measures (using the school, not students, who are nested within schools, as the unit of analysis), normalizing the school resource measures prior to analysis. The analysis yielded two factors. The first, which we label *school resources*, consists of the number of books in the school library; the percentage of full-time teachers with a master's degree or doctorate; the annual starting salary for a certified teacher with a bachelor's degree; and the number of full-time equivalent guidance counselors at the school. The number of books in the library and the number of school counselors were top-coded as 74,800 and 15, respectively. The four-item school resources scale has an alpha reliability of .60.

The second factor, which we label *student characteristics*, is the average of the (normalized) percentage of students who are classified as economically disadvantaged (according to Elementary and Secondary Education Act guidelines) and principal's report of the percentage of students who enter the tenth grade but drop out prior to graduation. This two-item index has an alpha reliability of .47. Descriptive data for males and females on school and individual characteristics are presented in Table 1.

3.3. *Individual Characteristics*

The other predictors in our analysis include socioeconomic origins, indicated as a trichotomous measure of years of schooling completed by the respondent's mother and father (low=10 years of schooling or fewer; medium=11 or 12 years of schooling; and high=13 or more years of schooling), race/ethnicity (coded Hispanic, Black, non-Hispanic or White, non-Hispanic), and sex. As we focus on a single cohort, it is necessary to control for age and for period effects in relation to graduation (Yang & Land, 2008), variables that could shape the type of pathway at the transition out of high school. Age at high school graduation is dichotomized as 18 and younger vs. 19 and older. Age at graduation could indicate the presence of individual prior academic failure, in turn influencing an individual's structure of opportunities, as well as his or her ambition and perspectives, shaping the type of future pathway that follows high school graduation. Year of graduation, recoded into “before 1976” “1977 or 1978”, “1979 or 1980”, and “after 1980”, allow to take account of macroeconomic trends which might shape the availability and desirability of jobs and/or schooling.

Table 1: Descriptive statistics

	Men		Women	
	n	%	n	%
Mother's year of education				
0 to 10	576	22.7	713	25.5
11 to 12	1392	54.8	1501	53.6
13 and more	570	22.5	584	20.9
Total	2538	100.0	2798	100.0
Father's year of education				
0 to 10	742	29.2	878	31.4
11 to 12	1013	39.9	1162	41.5
13 and more	783	30.9	758	27.1
Total	2538	100.0	2798	100.0
Race				
Hispanic	302	11.9	362	12.9
Black, non-Hispanic	497	19.6	569	20.3
White, non- Hispanic	1739	68.5	1867	66.7
Total	2538	100.0	2798	100.0
Age at graduation				
before 19	2327	91.7	2664	95.2
after 19	211	8.3	134	4.8
Total	2538	100.0	2798	100.0
Year of graduation				
Before 1976	494	19.5	605	21.6
1977-78	645	25.4	764	27.3
1979-1980	774	30.5	841	30.1
1981 and after	625	24.6	588	21.0
Total	2538	100.0	2798	100.0

4. Analytic techniques

We use optimal matching (OM) methods to classify the institutional schooling and work pathways observed during the five years following high school graduation for all 9,200 individuals in our panel. Our OM analyses were followed by cluster analysis to develop a set of distinctive categories describing institutional pathways and to classify individuals into these categories based on similarities in the pathways. This method allows us to observe the strength of the associations among the institutional pathways. This descriptive analysis is an advance over most other research on life course patterns, many of which treat a particular domain (e.g., the educational career, or the work career) in isolation from others, and do not take account of frequent observations of an individual's status (Abbott, 2001).

We aligned the sequences of educational and occupational status on the year of high school graduation, in contrast to other studies that use OM techniques to align sequences according to age (such as in Gauthier, 2007). TraMineR, a software program designed to study transitions and pathways (Gabadinho, Ritschard, Studer, & Müller, 2009), is used to match sequences. OM analysis seeks to quantify the difference between two sequences in terms of the number of elementary operations of insertion, deletion, and substitution of an individual's status needed to transform the first sequence into the second one (Sankoff & Kruskal, 1983). In our case, the cost of transformation is set to two for every transformation. TraMineR produces a matrix of distances between all pairs of individual sequences. We treat this matrix with a Ward method of classification, in order to obtain distinct clusters (or types) of individual longitudinal sequences. This method minimizes the intra-group variance and hence yields groups which differ substantially from one another (Lapointe & Legendre, 1994). We used Average Silhouette Width Analysis, a measure of the coherence of a clustering solution, to identify the appropriate number of institutional pathways to consider (Studer, 2012; Kaufmann & Russeeuw, 1990).

The final analysis consists of regressing the institutional pathway categories on individual characteristics, adding high school resource measures as a second step, which enables us to observe both the independent influence of these resources and the extent to which they mediate the effects of social background factors on the institutional trajectories. Results of this final step have to be interpreted with caution due to the possibility of nonrandom patterns of missing data on individual and school characteristics.

5. Results

Figure 1 presents a graphical representation of the five institutional pathways suggested by the Silhouette analysis. Each type displays the distribution of its members' educational and occupational status for each of the 60 months. We labeled each pathway according to the dominant features of the pattern.¹

The first pathway is characterized as *studying full-time*. Some individuals classified in this pathway spend some of the 60 months also working part-time, whereas others do not work at all during the five-year time span the pathway represents. The number of individuals working part-time in this type increases over the summer months, as many full-time students work during summer breaks from college. About one-third of individuals in the study (n=3016, 32.8%) are classified as studying full-time.

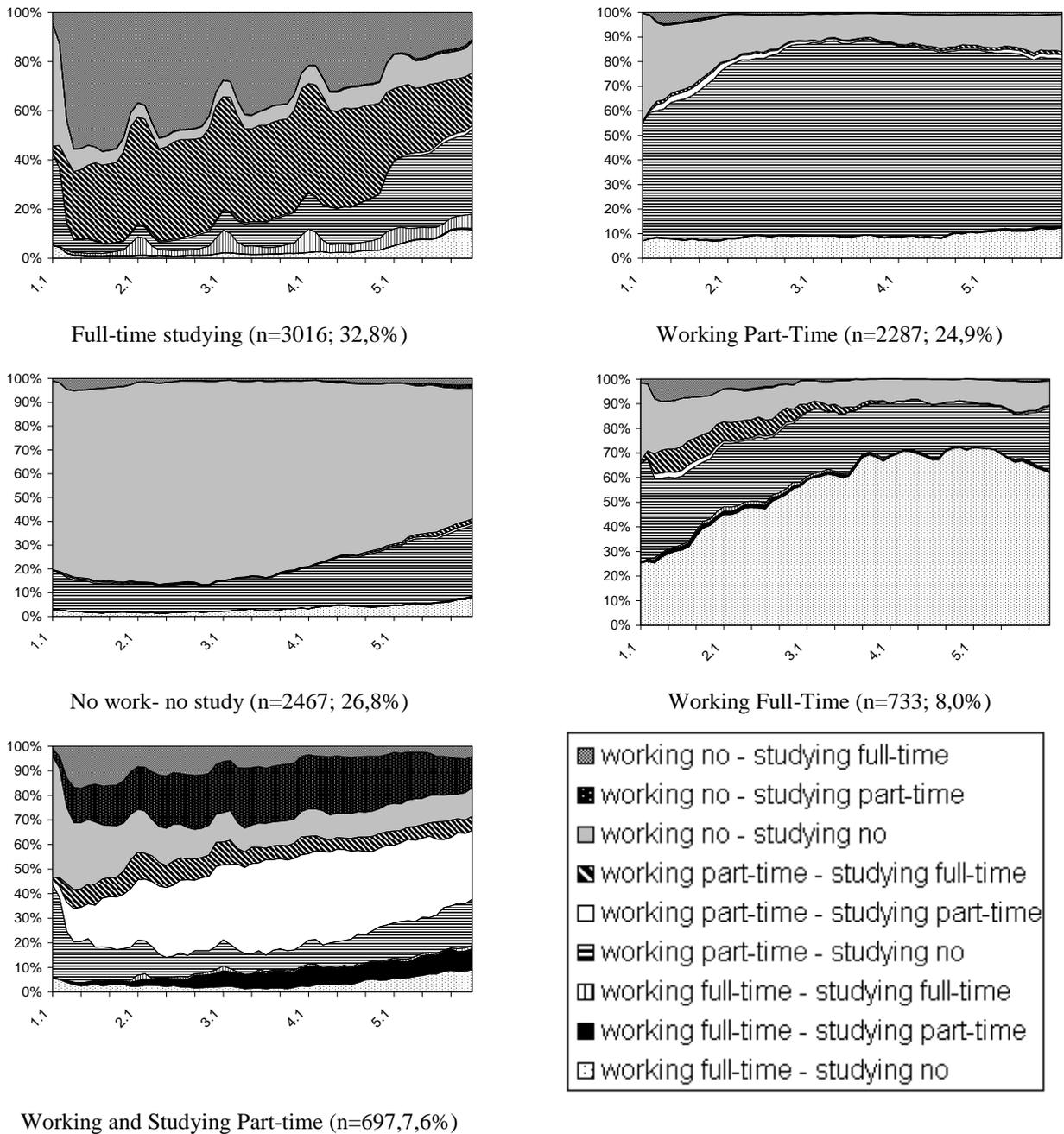
The second type of educational and occupational pathway represents individuals who are mainly *working part-time* during the five years that follow high school graduation. They represent 24.9% of the sample (n=2287).

The third institutional pathway classification consists of individuals who are neither working nor enrolled in school during much of the five-year period following high school graduation. We label this pathway *no work, no study*. The pathway captures 26.8% of the sample (n=2467). Individuals in this pathway gradually begin part-time work over the course of the five years.

The fourth institutional pathway is labeled *working full-time*. Some individuals have spells with neither work nor schooling, and/or a sequence of months in which they are working part-time and attending college part-time. About 8% (n= 733) of the sample belong to this type.

The fifth and last institutional pathway represents a minority of individuals who do not have a stable sequence of roles, but continue to switch from one status to another. The majority of them, however, are studying (mainly part-time) with or without working (mainly part-time), but episodes of educational or occupational inactivity are also present. We classify these individuals as having a *working and studying part-time* pathway, which seems to represent a pattern of uncertainty through school and work in the five years that follow high school graduation (n = 697; 7.6% of the sample).

¹ In parallel analyses computed for men and women separately we found no major differences in the results for the two genders. Therefore, we analyze men and women together. We will discuss later the different distribution of men and women in this typology.



Figures 1: Types of Post-High School Institutional Pathways for the five years after graduation.

Only 6,098 out of 9,200 individuals classified with one of the five institutional pathways do have school characteristics information in the dataset, which is approximately two-thirds of the sample. We estimate a logistic regression in order to identify the individuals with missing data. This helps us to identify selection effects for school variables that need to be taken into account in our results. Results of this regression (not reported in tables) indicate that Hispanic and Black, non-Hispanic youth, as well as males, individuals who graduated after their nineteenth birthday, and individuals who graduated after 1977 (compared to the ones who graduated in 1976 and before) are less likely to have school variables reported in the study. The latter pattern is not surprising, as school data collection only started in 1980.

Having classified individuals into one of the five specific institutional pathways, we estimate multinomial logistic regressions predicting pathway membership as a function of individual student characteristics and the resources of the high schools they attended (displayed in Table 2.) The reference pathway for the logistic regression analysis is *studying full-time*, which represents about one-third of the sample, and also is the pathway which is likely associated with the highest long-run socioeconomic success, given the economic returns to formal postsecondary schooling.

For each analysis, we estimate two models. The first introduces individual student characteristics (i.e., mother's education, father's education, race/ethnicity, sex, and age at high school graduation) and year of high school graduation, an indicator of macroeconomic conditions. The second model adds high school resources and high school student composition. The proportional shrinkage in the effects of individual student characteristics when high school characteristics are taken into account indicates the extent to which these high school characteristics mediate the effects of student background on post-high school institutional pathways.

These models are estimated only for those individuals with complete information on all variables in the analysis, which further diminishes the N of our sample to 5336 individuals. The coefficients reported in Tables 2 represent the change in the odds of being in the institutional pathway represented by a column, relative to the reference pathway of *studying full-time*, associated with a unit change in a predictor. All of the student characteristics are dummy variables, whereas the coefficients for school resources and high school student composition represent a change in the odds associated with a one standard deviation change in the predictor. As the reported coefficients are exponentiations of the logistic regression coefficients, a coefficient of 1.0 indicates that a predictor has no effect on the odds of being classified in a particular pathway; a coefficient greater than 1.0 implies that the predictor increases the odds of being in a particular pathway; and a coefficient less than 1.0 indicates that a predictor reduces the odds of being in a given pathway.

Equations I in Table 2 report the effects of individual student characteristics and year of high school graduation on the odds of having a particular institutional pathway in the five years following high school graduation, relative to the reference pathway of studying full-time. Social class origins are associated with the odds of a full-time schooling pathway relative to each of the others; lower levels of mothers' *and* father's education increase the odds of a work full-time pathway, a work part-time pathway, and a neither work nor school pathway, relative to the reference pathway of full-time enrollment. Non-Hispanic Black youth are more likely than non-Hispanic white youth to be unemployed and out of school during the five years after high school graduation, but are less likely than whites to be in the work pathways part-time or full-time compared to the full-time schooling pathway. This is consistent with other studies of youth during this historical period which show an advantage in college-going among black students when socioeconomic origins, and prior academic performance, are taken into account (Bennett and Lutz, 2009). Whereas Hispanic youth in the sample are more likely than non-Hispanic whites to be in a pathway of fluctuating spells of study and part-time work, and less likely to be working part-time or full-time, or to be unemployed and not enrolled in the five years that follow high school graduation.

The odds of working full-time during the five years that follow high school graduation are up to four times higher among young men than among young women, compared to the full-time enrollment pathway. The other types do not differ based on gender.

*Table 2: Multinomial Logistic Regression Predicting
Post-High School Institutional Pathways (N=5336)*

		Working Part-Time		No Work - No Study		Working Full-Time		Working and Studying Part-time	
		N=1470		N=872		N=515		N=382	
		I	II	I	II	I	II	I	II
Mother's education	Low	4.29 **	4.24 **	4.06 **	3.99 **	2.64 **	2.58 **	0.98	1.00
	Medium	3.29 **	3.28 **	2.69 **	2.68 **	2.29 **	2.27 **	1.15	1.17
Father's education	Low	3.18 **	3.09 **	4.38 **	4.20 **	2.40 **	2.29 **	0.83	0.85
	Medium	2.60 **	2.57 **	3.03 **	2.98 **	2.31 **	2.24 **	1.19	1.21
Race	Hispanic	0.67 **	0.63 **	0.73 *	0.68 **	0.52 **	0.52 **	1.51 *	1.37
	Black, not Hisp.	0.52 **	0.49 **	1.31 **	1.21	0.30 **	0.29 **	1.02	0.93
Age at graduation	18 and younger	0.29 **	0.30 **	0.27 **	0.28 **	0.33 **	0.33 **	0.51 *	0.51 *
Year of graduation	1976 or earlier	0.64 **	0.65 **	1.14	1.17	0.84	0.85	0.55 **	0.55 **
	1977-78	1.35 **	1.37 **	0.90	0.92	1.29	1.32	0.71 *	0.71 *
	1979-80	1.19 **	1.21	1.16	1.19	1.25	1.28	0.85	0.84
Sex	Male	1.02	1.02	0.85	0.85	4.23 **	4.23 **	1.04	1.04
School resources			1.00		1.00		0.91		1.19 **
Students characteristics			0.89 **		0.85 **		0.93		0.91

Note: Reference pathway = Full-Time Studying (n=2097). Coefficients are effects on the odds of

Age at high school graduation is a powerful predictor of a student's post-high school institutional pathway. Students who graduated “in time” from high school at the age of 18 or younger are considerably more likely to be in college full-time during the five years after high school than are youth who graduated at the age of 19 or older. This is true for each of the four institutional pathways which are contrasted with full-time study. The odds of a student being in the full-time study pathway are two ($1/.51=1.96$) to four ($1/.27=3.70$) times greater for students who were not overage at the time of high school graduation than for overage youth. We also observe some evidence of a period effect on postsecondary institutional pathways. The odds of being in the work part-time pathway rather than the full-time enrollment pathway are two-thirds as large for students who graduated from high school in 1976 or earlier than for those who graduated from high school in 1981 or later, but 1.3 times higher for individuals who graduated between 1977 and 1978. Conversely, the odds of being in the uncertain pathway of work and study part-time rather than the full-time schooling pathway are 1.4 to 1.8 times greater for youth who graduated from high school in 1981 or later than those who graduated before then. It is interesting to note that the odds of being unemployed and not enrolled during the five years that follow graduation is not related to the year of graduation, but rather is a persistent pattern across years.

Equations II add the two high school resource measures to the equation which includes student background characteristics and year of graduation. The effects of student characteristics on the odds of a particular pathway, relative to the reference pathway of full-time postsecondary enrollment, decline by approximately 10% for the “work part-time” and the “no work, no study” pathways. This suggests that variations in school resources explain about 10% of the total effects of students' social background characteristics on institutional pathways in the five years following high school graduation. We can also observe that school resources explain about 20% of social background effects for individuals with a *work and study part-time* pathway compared to full-time enrollment.

The source of these mediating effects is related to both the student body composition of the high school attended and the school's resources. Attending a high school with a more advantaged student body systematically increases the likelihood of the full-time study pathway rather than part-time work, or neither work nor school. A one standard deviation increase in student body advantages (i.e., a lower percentage of disadvantaged students and high school dropouts) increases the odds of the full-time enrollment pathway by 12% ($1/.89=1.12$) to 17% ($1/.85=1.17$).

School resources predict the odds of pursuing full-time postsecondary schooling after high school graduation versus a pathway of changing work and study part-time. Individuals in this latter pathway appear to come from high schools with more important material resources. As pointed out

above, Blacks, those older than 18 at graduation and those graduating after 1981 are more likely to pursue this pathway than the full-time enrollment pathway.

Finally, we note that the odds of working full-time or being enrolled full-time (with or without working) do not depend on high-school related variables but only on individual characteristics, such as parent's education, sex, race and age at graduation.

6. Discussion

In framing this study, we sought to extend the existing literature in several ways. First, we wanted to develop a more sophisticated way of categorizing the institutional careers of youth which would move beyond a snapshot of an individual's educational and occupational status at a predefined moment in time, such as two years or four years after high school graduation, or as the first institutional pattern adopted after graduation. Our Optimal Matching Analysis (OMA) succeeded in doing so, identifying five distinctive institutional pathways in the five years following high school graduation. This method allows describing the transition out of high school in all its complexity, inconsistency, and uncertainty over time. In fact, the fifth pathway identified shows that individuals could modify (when resources allow it) the type or the intensity of their social participation in school and work. With this technique we also sought to avoid the challenge of identifying a causal effect of a sequence of postsecondary enrollments on work intensity, and vice versa, due to the challenges in modeling such reciprocal effects.

The typology that resulted from the analysis and the classification of individual sequences of roles can be understood as the result of the dynamic interplay between social structures (including the welfare state, the labor market and the educational system) and individuals' resources. This approach was inspired by, and intends to illustrate, the potential of the CDA hypothesis, which we argue is an advance over other theories explaining inter-individual stratification in the life course. Although the project is unable to observe or model the ways in which individuals' choices are rooted simultaneously in personal resources and social structure, it suggests the promise of doing so.

Having established that it is possible to identify a set of institutional pathways, do we find support for the CDA hypothesis in our analyses? Our provisional conclusion is that we do, although high school resources, at least as we have been able to measure them, are not the central mechanism by which advantages may accumulate over time. The links between social origins and post-high school institutional pathways are strong; and we observe these linkages on a selected sample, as all of the study

participants were high school graduates, in an era when perhaps three-quarters to four-fifths of an age cohort completed a regular high school program of study. It is possible that evidence of cumulative advantage might be stronger in a study which allowed for social background factors and high school resources to affect the odds of graduating from high school.

The claim that there is a cumulative advantage mechanism stems from the finding that social origins continue to influence institutional pathways even when an intervening variable, the quality of a youth's high school, is taken into account, and that high school quality itself generates even more variability in institutional pathways. Specifically, we find relatively consistent evidence that attending a high school with more advantaged classmates increases the odds of a full-time schooling pathway after high school graduation. There is a strong and extensively documented association between social background and student body composition, driven by the high levels of economic and racial/ethnic segregation in American society that is isomorphic with school and school district boundaries and resources. The fact that advantaged students attend advantaged schools, which in turn yields advantaged institutional pathways, is a form of cumulative advantage over the life course.

We cannot, however, delve deeply here into the mechanisms by which high school resources might augment the advantages stemming from more advantaged conditions of birth. Pursuing full-time schooling after high school is a pathway pursued by individuals who can afford it, whose prior academic record legitimates it, and who view postsecondary education as a route to success for people like them. The choice to enroll for full-time study is then related to structural opportunities and the personal motivation and ambition to follow this pathway, both influenced by social structure and human agency.

Gender is also a differentiating characteristic: males are more likely than females to follow a pathway of full-time work after high school, whereas females travel the full-time study pathway more often than males. It is likely that this pattern is circumscribed by time and place; the expansion of women's participation in higher education in the U.S. and worldwide is well-known (DiPrete & Buchmann, 2013). Incorporating family pathways into the analysis (for example, with a multi-channel analysis that consider both, familiar and institutional pathways) would no doubt yield more differences in the life course of men and women following high school graduation.

A curious result concerns the difference in school resources effects for individuals studying full-time after high school graduation and those following a mixed pathway of school and work part-time. The fact that individuals in this latter pattern were more likely to graduate from high school after the age of 19 indicates that their pathways were already turbulent before graduation from the high school, and the same pattern is reproduced after graduation in post-secondary enrollment. Also this result suggests

that a pathway of “experimentation” (Arnett, 2004), as one might characterize this pattern, is possible only in the presence of adequate stocks of economic and cultural capital.

Our study has its limitations. First, despite the fact that we were able to assemble long institutional sequences of episodes of school and work from monthly data, our data are representative of an old cohort of young adults. Moreover, the measures of school resources are highly limited, and we lack direct measures of academic performance prior to high school graduation. It is difficult to discern the extent to which we are at the mercy of a relatively weak set of indicators of high school resources that are some distance away from the day-to-day experiences of students which might shape their choice of pursuits after high school. By design, the measured school resources and student body composition are not highly correlated, so it is not the case that the presence of one is swamping or suppressing the expression of the influence of the other.

7. Conclusions

Sociologists studying the intersection of sociology of education, social stratification and the sociology of the life course often rely on the theoretical perspectives and methodological tools common to their areas of specialization. The Cumulative Dis/Advantage Hypothesis is a theoretical framework lends itself to the study of how inequalities emerge over the life course. This study documents the potential of this framework, and new methods for classifying the pathways which describe how individuals move through social institutions, and for understanding the mechanisms that produce cumulative advantages and disadvantages. Analyses such as the one presented here hold the promise of ever more sophisticated approaches to modeling the interactions between individuals and social institutions.

Our results underline the fact that social policy should pay more attention to the process of cohort aging and the stratification that occurs within cohorts. The focus on life course transitions, such as high school graduation, the onset of adult work, or the birth of the first child, are important markers which may hold the key to understanding cohort differentiation.

References:

- Abbott, Andrew. 2001. *Time Matters: on theory and method*. The University of Chicago Press, Chicago.
- Arnett, Jeffrey J. 2004. *Emerging adulthood: The winding road from late teens through the twenties*. New York: Oxford University Press.
- Barban, Nicola, Billari, Francesco. 2012. Classifying life course trajectories: A comparison of latent class and sequence analysis. *Journal of the Royal Statistical Society: Series C*, 61, 765-784.
- Bennett, Pamela R., & Lutz, Amy. 2009. How African American is the net black advantage? Differences in college attendance among immigrant blacks, native blacks, and whites. *Sociology of Education* 82:70-100.
- Betts, Julian. 1995. Does School Quality Matter? Evidence from the National Longitudinal Survey of Youth. *The Review of Economics and Statistics*, 77, 231-250.
- Blau, Peter M., Duncan, O. Dudley. 1967. *The American occupational structure*. John Wiley & Sons, New York.
- Borman, Geoffrey, Dowling, Maritza. 2010. Schools and inequality: A multilevel analysis of Coleman's Equality of Educational Opportunity data. *Teachers College Record*, 112, 1201-1246.
- Bourdieu, Pierre. 1973. Cultural reproduction and social reproduction. In Richard Brown (Ed.) *Knowledge, Education, and Cultural Change*, pp. 71-112. London: Tavistock.
- Coleman, James S., Campbell, Ernest Q., Hobson, Carol J., McPartland, James, Mood, Alexander M., Weinfeld, Frederic D. & York, Robert L. 1966. *Equality of Educational Opportunity*. Washington, DC: US Department of Health, Education & Welfare. Office of Education (OE-38001 and supp.).
- Dannefer, Dale. 2003. Cumulative advantage/disadvantage and the life course: Cross-fertilizing age and social science theory. *Journal of Gerontology* 58, S327-S337.
- Deil-Amen, Regina, Turley, Ruth Lopez. 2007. A review of the transition to college literature in sociology. *Teachers College Record*, 109, 2324-66.

- DiPrete, Thomas A., & Buchmann, Claudia. 2013. *The rise of women: The growing gender gap in education and what it means for American schools*. New York: Russell Sage Foundation.
- Elder, Glen H. Jr., Johnson, Monica K., Crosnoe, Robert. 2003. The emergence and development of life course theory. In: Mortimer, J. T., and Shanahan, M. J., (Eds.), *Handbook of the life course*. Kluwer Academic, New York.
- Ferraro, Kenneth F., Kelley-Moore, Jessica A. 2003. Cumulative disadvantages and health: Long-term consequences of obesity? *American Sociological Review* 68, 707-729.
- Ferraro, Kenneth F., Shippee, Tetyana P. 2009. Aging and cumulative inequality: How does inequality get under the skin? *The Gerontologist* 10, 1-11.
- Gabadinho, Alexis, Ritschard, Gilbert, Studer, Matthias, Müller, Nicola S. 2009. Mining sequence data in R: A user's guide. Technical report, Department of Econometrics and Laboratory of Demography, Geneva.
- Gauthier, Jacques-Antoine. 2007. Empirical categorizations of social trajectories: A sequential view on the life course, Université de Lausanne, SSP, Lausanne.
- Hauser, Robert M., Sewell, William H., Alwin, Duane F. 1976. High school effects on achievement. Pp. 309-41 in William H. Sewell, Robert M. Hauser and David L. Featherman (Eds.), *Schooling and Achievement in American Society*. New York: Academic Press.
- Heinz, Walter R. 1999. *From Education to Work: Cross-National Perspectives*. Cambridge University Press, Cambridge.
- Hill, Lori. 2008. School strategies and the “college-linking” process: Reconsidering the effects of high schools on college enrollment. *Sociology of Education*, 81, 53-76.
- Hogan, Dennis P. 1978. The variable order of events in the life course. *American Sociological Review*, 43, 573-586.
- Kaufman, Leonard, Rousseeuw, Peter. 1990. *Finding groups in data. an introduction to cluster analysis*. New York : Wiley.
- Kerckhoff , Alan C. 1976. The status attainment process: Socialization or allocation? *Social Forces*, 55, 368-81.

- Kerckhoff, Alan C. 1993. *Diverging pathways: Social structure and career deflections*. Cambridge University Press, Cambridge.
- Lapointe, Francois-Joseph, Legendre, Pierre. 1994. A classification of pure malt Scotch whiskies. *Applied Statistics*, 43, 237–257.
- Lucas, Samuel R. 2001. Effectively maintained inequality: Educational transitions, track mobility, and social background effects. *American Journal of Sociology*, 106, 1642-90.
- Macmillan, Ross, Eliason, Scott. 2003. Characterizing the life course as role configurations and pathways: A latent structure approach. Pp. 529-554 in Jeylan Mortimer & Michael Shanahan (Eds). *Handbook of the Life Course*. New York: Kluwer.
- Merton, Robert K. 1973. *The Sociology of science: Theoretical and empirical investigations*. University of Chicago Press., Chicago.
- Merton, Robert. 1988. The Matthew Effect in science, II: Cumulative advantage and the symbolism of intellectual property. *Isis*, 79, 606-623.
- Miech, Richard A., Shanahan, Michael J., 2000. Socioeconomic status and depression over the life course. *Journal of Health and Social Behavior*, 41, 162-76.
- Namboodiri N. Krishnan. 1987. The floundering phase of the life course. In Ronald G. Corwin (Ed.), *Research in sociology of education and socialization*, Vol. 7, pp 59–86. JAI: Greenwich, CT.
- Pallas, Aaron, 2003. Educational transitions, trajectories, and pathways. In: Mortimer, Jeylan T., and Shanahan, Michael J., (Eds.), *Handbook of the Life Course*. Kluwer Academic / Plenum, New York, pp. 165-184.
- Raftery, Adrian, Hout, Michael J. 1993. Maximally maintained inequality: Expansion, reform and opportunity in Irish education, 1921-75. *Sociology of Education*, 66, 41-62.
- Roderick, Melissa, Nagaoka, Jenny, Coca, Vanessa. 2011. Potholes on the road to college: High school effects in shaping urban students' participation in college application, search and enrollment. *Sociology of Education*, 84, 178-211.
- Ross, Catherine E., Wu, Lawrence. 1996. Education, age, and the cumulative advantage in health. *Journal of Health and Social Behavior* 37, 104-120.

- Sankoff, David, Kruskal, Joseph. Time warps, string edits, and macromolecules: The theory and practice of sequence comparison. 1983. Addison-Wesley.
- Schoenhals, Mark, Tienda Marta, Schneider, Barbara. 1998. The educational and personal consequences of adolescent employment. *Social Forces*, 77, 723–762.
- Sewell, William H., Hauser, Robert M. 1975. Education, occupation and earnings: Achievement in the early career. New York: Academic Press.
- Sewell, William H., Hauser, Robert M., Springer, Kristen W., Hauser, Taissa. 2001. As we age: The Wisconsin Longitudinal Study, 1957-2001. Center for Demography and Ecology Working Paper No. 2001-09, University of Wisconsin-Madison.
- Sewell, William, Haller, Archibald, Ohlendorf, George. 1970. The educational and early occupational attainment process: Replication and revision. *American Sociological Review*, 35, 1014-27.
- Sewell, William, Haller, Archibald, Portes, Alejandro. 1969. The educational and early occupational attainment process. *American Sociological Review*, 34, 82-92.
- Staff, Jeremy, Schulenberg, Bachman, Jerald G. 2010. Adolescent work experience, school performance, and academic engagement. *Sociology of Education*, 83, 183-200.
- Stüder, Matthias. 2012. Étude des inégalités de genre en début de carrière académique à l'aide de méthodes innovatrices d'analyse de données séquentielles. PhD Thesis (University of Geneva, Switzerland).
- Taylor, Miles. 2010. Capturing Transitions and Trajectories: The Role of Socioeconomic Status in Later Life Disability. *The Journals of Gerontology B: Psychological Sciences and Social Sciences*, 65, 733-743.
- Warren, John Robert, LePore, Paul C., Mare, Robert D, 2000. Employment during high school: Consequences for students' grades in academic courses. *American Educational Research Journal*, 37, 943-969.
- Warren, John Robert. 2002. Reconsidering the relationship between student employment and academic outcomes: A new theory and better data. *Youth & Society*, 33, 366-393.

Willson, Andrea, Shuey, Kim, Elder, Glen H., Jr. 2007. Cumulative advantage processes as mechanisms of inequality in life course health. *American Journal of Sociology*, 112, 1886-1924.

Wu, Lawrence. 2000. Some comments on "Sequence analysis and optimal matching methods in sociology: Review and prospect". *Sociological Methods & Research* Vol. 29, 41-64.

Yang, Yang, Land, Kennet. 2008. Age–Period–Cohort Analysis of Repeated Cross-Section Surveys: Fixed or Random Effects? *Sociological Methods Research*, 36, 297-326.