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Vertically Segregated Higher Education and the Life Course: Comparing Patterns over 28 Years¹

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Abstract

We employ longitudinal survey data from the British Columbia, Canada *Paths on Life's Way* project to determine educational participation and completion patterns through a vertically segregated articulated postsecondary system and occupational outcomes 28 years later. Also, we examine the extent to which ascriptive characteristics have “dissipating” or “lingering” effects on educational and occupational outcomes. Through sequence analysis and cluster analysis, we illustrate postsecondary enrolment and completion rates by institutional type from 1988 to 2016. We reveal five distinct clusters. We use multivariate analyses to demonstrate how education and employment outcomes differ for those who embarked on “traditional” and “non-traditional” higher education pathways. We conclude that ascriptive characteristics in mid-adulthood have had both dissipating and lingering effects on educational and occupational outcomes.

Keywords: educational and occupational outcomes; vertically segregated higher education systems; dissipating and lingering effects

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In North America, educational systems generally adhere to what Ralph Turner (1960) coined as a “contest mobility” framework. The central goals of contest mobility are to enhance educational participation for the greatest number of individuals, to minimize tracking within the educational system, and to keep the “contest” – that is, participation in education – open as long as possible. This is in contrast to “sponsored mobility” which is characterized by strict tracking, selection and extraction of a small elite from the mass population, and a limited number of places at the university level.

However, contest mobility can take many forms. In Canada, because responsibility for all levels of education rests within each province and territory, distinct differences have emerged over time. For example, in the 1960s, Ontario embraced a binary model of higher education that did not, and for the most part still does not, permit transfer between the non-university and university sectors. The educational system in Quebec is unique in that after completing secondary school at the end of the 11th year all students enrol in the *Cégep (Collège d'enseignement général et professionnel or General and Vocational College)*. The *Cégep* system offers either terminal diploma programs or academic programs that, upon completion, lead to university study (Andres, 2015).

British Columbia and Alberta are considered vertically segregated articulated models – sometimes referred to only as “articulated” or “seamless” systems – of higher education. In principle, at one extreme a student without a high school diploma can enter an adult basic education program in a non-university institution and wind her or his way through the system with the possibility of eventually earning a PhD. At the other extreme, a student with the requisite high school credentials can enter directly into a university program. This student, too, may eventually earn a PhD.

How does a vertically segregated articulated system of higher education have an impact on the educational, occupational, and other life course outcomes of individuals from young adulthood through to middle age? The purpose of this chapter is to document the educational and occupational trajectories of the high school graduating Class of 1988 in British Columbia, Canada. Although this study is located in one Canadian province, it can be considered a specific example of the general case of vertically segregated articulated systems of higher education. Following a description of the historical development of the British Columbia higher education system and an overview of theories of social inequality in relation to vertical

stratification, we pose the following research questions: *What are the postsecondary enrolment, transfer, and completion patterns of the Class of 1988? What are the long term occupational outcomes of this cohort? Do outcomes differ for those who embarked initially on “traditional” (i.e., direct university attendance from high school) or “non-traditional” (i.e., indirect attendance from high school via the college sector) pathways? And finally, to what extent do ascriptive characteristics have “dissipating” or “lingering” effects on these outcomes?* We employ longitudinal survey data spanning 28 years (1988-2016) from the Canadian *Paths on Life’s Way* study (Andres, 2002) and the analytical techniques of sequence analysis, cluster analysis, and multinomial regression to consider how education and employment outcomes differ depending on the higher education pathway undertaken.

The Higher Education System in British Columbia: A Short History

The evolution of the higher education system in British Columbia was the result of a vision portrayed in a 1962 report, entitled *Higher Education in British Columbia*, by the President of the University of British Columbia, John Macdonald (Macdonald, 1962). By noting advances in computer technology and the potential for scientific and technological knowledge to address the problems facing humanity, and by pointing out that “the cliché that learning should be a life-long process is now becoming a cold fact of economic survival” (p. 48-49), Macdonald posed the following question: “What kinds of higher education should be made available, in which institutions, and how should students be selected for the various kinds of institutions which may be proposed?” (p. 48).

Informed by the California Master plan, Macdonald’s 1962 report provided a detailed blueprint that would launch a completely new system of higher education. One key requirement to achieve excellence and equity in the expanded and extended higher education system that he proposed was *diversification* in terms of the *kinds* and the *geographic locations* of available educational opportunities. Macdonald argued, from a functional perspective, that the need for alternative educational programs that did not duplicate those offered at the university were “obvious” in that

individuals may be suited intellectually and by aptitude and attitude for very many different kinds of vocation Clearly many different kinds of education are required for citizens whose talents and interests are so different and whose vocations or careers are so dissimilar. It is inconceivable that any one educational institution can serve successfully the wide range of educational objectives needed for the modern world (p. 20).

In other words, the new system was to be vertically segregated by design.

Macdonald recommended the establishment of new four-year colleges that would focus on university level education in the liberal arts, sciences, the professions, and graduate studies in major urban centres. In addition, he proposed that several two-year community colleges be created in various locations across the province. The objectives of community colleges would include one or more of the following: (1) two-year academic programs that would either be terminal in nature or would lead to transfer to degree granting institutions; (2) technical and vocational courses that would not be transferable to degree granting institutions; and (3) continuing adult professional education to provide a lifelong learning dimension.

As part of the first criterion, an articulation component – that is transfer – was added to the vertically segregated structure. Two additional measures would enhance equality of opportunity. First, a comprehensive set of educational opportunities would be available to individuals throughout the province and not only in large urban centres. Second, to enhance student transfer among institutions, programmatic offerings would be parallel rather than identical.

Within 15 years of this publication, the landscape of the British Columbia higher education system had changed dramatically with the establishment of a vertically differentiated system of higher education. In addition to the existing University of British Columbia, two additional universities and 14 community colleges were created which greatly enhanced access to postsecondary education. Over the next 15 years, some identified weaknesses – low participation rates in general, low transition rates of high school graduates to the postsecondary system, and low transfer rates within the system – were addressed (Andres & Dawson, 1998b; Cowin, 2017).

Students in many other Canadian provinces were forced to choose between community college or university attendance, with no possibility for those choosing the former to be able to

transfer to the latter. In British Columbia, by the late 1980s high school graduates faced a system that allowed for considerable articulation from sending (e.g., non-university) to receiving (e.g., university) institutions. The British Columbia system was designed to achieve equity and academic excellence by creating multiple pathways through the system. However, it is well documented in the sociology of education literature that the structure of the system is only one factor in determining educational and occupational outcomes.

Vertical Stratification of Higher Education

Davies and Guppy (1997) define two axes that segregate systems of higher education. The first axis refers to hierarchical institutional arrangements according to prestige and selectivity, with two-year community and vocational colleges on the lowest tier and elite universities at the pinnacle. The second axis refers to the intra-institutional stratification of fields of study. Charles and Bradley (2002) labelled the first axis *tertiary level* representing vertical stratification and the second axis, *field of study* representing horizontal stratification. In this chapter we focus on vertical stratification (for a related analysis focussing on horizontal stratification, see Pullman & Andres, 2015). We adopt an inclusive social stratification perspective to consider extent to which educational and occupational outcomes are independent of an array of ascriptive characteristics. Ascriptive characteristics, or structural inequalities, include but are not limited to socioeconomic status (e.g., parental education, occupation, and income), gender, ethnicity, race, and geographic location (Bidwell & Friedkin, 1988; Clark, 1973). These factors together define one's position along the disadvantage/advantage continuum.

The British Columbia system was designed to increase educational opportunities during a period of higher education massification. In particular, the diversified nature of a vertically stratified system was intended to be a democratizing strategy. From a functional perspective, such systems contribute to society by providing the technical skills needed in an increasingly complex economy. However, conflict theorists argue that hierarchical institutional arrangements create an intentional "diversion effect" with the goal of excluding disadvantaged youth from attending universities (Brint & Karabel, 1989). Expansion of the number of places at non-elite institutions, according to Charles and Bradley (2002), may indeed increase, rather than reduce, vertical stratification for disadvantaged groups, and in particular, women.

Numerous studies have demonstrated the relationship between origin, in terms of ascriptive characteristics, and educational and occupational outcomes (Andres & Krahn, 1999; Krahn, Howard, & Galambos, 2015; Triventi, 2013). Often, however, short time frames (e.g., five years) are used to delineate school-to-work transitions. In this chapter, we embrace a life course perspective to determine the educational and occupational outcomes of a cohort of individuals from late adolescence to middle adulthood. In doing so, we examine not only initial postsecondary educational participation but the sequences of participation by *Paths* respondents over 28 years. Also, we can determine the extent to which ascriptive characteristics have truly “dissipating” or “lingering” effects (Davies & Guppy, 1997) as the dataset we employ follows individuals to around age 46. Dissipating effects can be explained through a life course hypothesis (Müller & Karle, 1993); as individuals become increasingly independent from their parents and have more autonomy in terms of educational opportunities, the relationship between social background and educational outcomes is reduced. Or, as Mare (1980) claims, due to continuous selectivity, social class effects decline at each level within the educational system. The lingering effects dimension can be seen as an extension of the diversion argument; that is, those from disadvantaged backgrounds may opt to begin their studies at non-elite institutions only to have their intentions to transfer up the vertical hierarchy thwarted due to the “cooling out” (Clark, 1960) of their educational aspirations. Also, because the postsecondary system serves as a filter that sorts individuals into different occupations (Arrow, 1973), the effects of ascriptive characteristics on various trajectories through the educational system may indeed linger to the point of being permanent fixtures in the lives of individuals and their families.

Research Design

We employ data from the *Paths on Life's Way* project. The *Paths* project began in 1989 as a collaborative governmental and postsecondary institutional endeavour to collect baseline data on the postsecondary attendance patterns of a cohort of high school graduates one year following high school graduation. In 1993, Lesley Andres extended the study and today it is the only longitudinal database of its kind in British Columbia and one of the few remaining longitudinal studies of the transition from youth to adulthood in Canada that combines extensive quantitative and qualitative analyses to examine the lives, actions, and social and cultural contexts of individuals. This database spans 28 years and contains detailed education, work, and life course related information collected at six points in time – 1989, 1993, 1998,

2003, 2010, and 2016. In total, 516 individuals have completed mail out surveys for all waves of data collection. The *Paths* database includes detailed information on postsecondary education, employment, unemployment, and “other” activities, affective variables such as happiness and occupational satisfaction, and personal background information. Hence, the *Paths* dataset is ideal for portraying the nature of transitions and trajectories over a long period of time.

Variables

In this chapter, we use data from the respondents who participated in all phases of the survey mail out data collection and present analyses of the entire 28 years. In total, after accounting for missing data, 485 valid cases are used in the analyses. The foundational data are the institutions that *Paths* respondents attended over 28 years. These institutions are as follows: community college, university college, technical or vocational training institute, university, private institute, a combination of several institutes, and other. Over the years, some of these institutional types have been transformed in terms of the credentials offered and, in some cases, were renamed to reflect these changes. In our analysis, we label the institutional type according to its official definition within a given five-year period (1988-93, 1993-98, 1998-03, 2003-10; 2010-16) (For more detail, see Andres & Offerhaus, 2012).

To interpret sequence and cluster analyses, we use several independent variables. These include dummy variables for gender, if at least one parent had earned a baccalaureate degree or higher, metropolitan location of high school graduation, and eligibility for university admission. We also incorporate a continuous variable of respondents' Grade 12 grade point averages (GPA) and a dummy variable indicating if the respondent graduated high school with the requirements necessary for direct university entry. In addition, continuous variables denote the number of years in full- and part-time postsecondary education and work and dummy indicators represent the proportion of respondents who earned baccalaureate degrees or higher by 2016 and – among them – the proportion with spouses who had earned bachelor's degrees or higher. To examine socio-economic outcomes, we also provide a continuous measure of respondents' 2016 total household income adjusted for family size, a dummy variable of the proportion who held management duties in their current or most recent 2016 job, and

a continuous occupational prestige score of current or most recent job in 2010 (i.e., Blishen score).

Methods and Analysis

Our research utilizes three methods: sequence analysis, cluster analysis, and multinomial logistic regression. First, we use sequence analysis (SA) to compare pathways through postsecondary institutions over the complete 28 year period. Sequence analysis is used in the social sciences as a holistic approach to longitudinal research (Abbott, 1990). SA portrays change over time by constructing sequences of activities at the individual level. It allows for an examination of enrolment, transfer among different types of institutions, and even postsecondary re-entry later in adulthood through 28 discrete yearly measures that form a complete sequence for each respondent. Next, we conduct optimal matching based cluster analysis to generate sequence groupings. Cluster analysis is based on a pairwise distance matrix that defines differences among each 28 year sequence. Given that our intent is to illustrate transfer among postsecondary institutions, we use a theory driven substitution matrix for cluster analysis.²

Descriptive tabulations and multinomial logistic regression determine the extent to which different background factors and life course experiences characterize each cluster. We transform cluster membership into a nominal categorical variable that indicates to which cluster each respondent belongs. We then use this variable as the dependent variable of a multinomial logistic regression model – also known as a discrete choice model – to examine the relationship between our independent variables and the likelihood of belonging to each cluster (Hosmer, Lemeshow, & Sturdivant, 2013). Like logistic regression, multinomial regression is based on a likelihood function which generates conditional probabilities for each outcome category in comparison to a single reference category. The logit coefficients can be transformed to generate the odds of belonging to a cluster compared to the reference group. However, in multinomial logistic regression, the odds are termed the “relative risk ratio” given that cluster membership is independent (Hilbe, 2009). We used Stata version 14 (StataCorp,

² To ensure that non-attendance did not drive the formation of clusters, the matrix is comprised of a substitution cost of one for non-attendance, a substitution cost of two for universities, a substitution cost of three for all other institutional types, and an insertion/deletion cost of four. We use discrepancy measures to guide our choice in the number of clusters (Studer, Ritschard, Gabadinho & Müller, 2011).

2015) and Stata's Sequence Analysis Distance (SADI) package (Halpin, 2014) for the analyses.

Findings

Figure 1 illustrates institutional sequences of all respondents over the complete 28 year period, from high school graduation to mid-adulthood. Each line is an individual enrolment trajectory and each colour indicates what type of postsecondary institution she or he reported attending. Figure 1 demonstrates that postsecondary enrolment sequences differed widely among individuals – there are 406 unique sequences among the 485 respondents. The mean number of transitions among postsecondary institutions and between attendance and non-attendance is 5.12 (s.d.=2.85, range 1-15). The educational trajectories through the postsecondary system by *Paths* respondents are clearly heterogeneous, with many participants enrolling in different types of institutions over the course of their lives.

Figure 1 also provides evidence of commonality among respondents. Upon high school graduation, most enrolled directly into postsecondary institutions, mainly universities (red), university-colleges (blue), and community colleges (yellow). At the top of the graph a small number of individuals did not make the transition directly from high school to postsecondary study. Over 28 years, only a small number (4.5%) never attended a postsecondary institution. Some individuals who initially attended community colleges and university colleges transferred to universities after one or more years. Trajectories become more diverse over time. Ten years after high school graduation, most respondents were no longer attending postsecondary institutions. Nevertheless, life long participation is still visible, with many re-enrolling in later adulthood. Finally, over the entire period covered in this analysis, there is comparably less participation in technical or vocational training (green), private (light blue), and other (light purple) institutions.

---Place Figure 1 Here---

Next, we use cluster analysis to identify trajectories within the diversity of institutional attendance patterns in Figure 1. Table 1 provides a summary of related descriptive statistics. In Figure 2, we identify five postsecondary attendance clusters. Each is described below. The first two clusters are characterized by direct entry into university from high school; however,

distinct differences are evident. In contrast, Clusters 3, 4 and 5 entered the college sector primarily after high school graduation and are characterized by varying levels of transfer to university.

Cluster 1. University Only

The first cluster represents 18.1% ($n=88$) of all *Paths* respondents. Overwhelmingly, members of Cluster 1 enrolled in university directly after high school graduation and had almost no exposure with other types of postsecondary institutions. Most individuals in this cluster stayed enrolled in university for most of their 20s and a small number continued to attend university into their 30s to gain graduate level and professional credentials. Remarkably, this cluster is overrepresented by males. That is, in the total sample, 61% are female. In this cluster, only 57% are female, which must be viewed in light of provincial university completion rates. In 2017, 26% of women and 20% of men aged 35-44 in British Columbia had earned bachelor's degrees or higher (Statistics Canada, 2016). Given that the *Paths* dataset is comprised of 61% women, we would expect a larger proportion of women to belong to this cluster. Also, this cluster has the highest proportion of one or more parents who had earned baccalaureate degrees or greater. Almost 55% completed high school in a metropolitan area.

---Place Figure 2 Here---

In terms of high school outcomes, members of Cluster 1 were high achievers, with 88% possessing the coursework required for university entrance and a median GPA of 5.7. They were enrolled in postsecondary institutions for a median 5.2 years – a full 1.3 years longer than the total median. By 2016, 93% had earned bachelor's degrees or greater, which is 33% higher than the total average. Also, Cluster 1 members with earned university degrees or higher were far more likely (63%) than any other cluster (32% for the entire sample) to have spouses with the same level of credentials in 2016. Members of Cluster 1 worked full-time for a median of 18.5 years which is not inconsistent with the other clusters. However, a median of 2.7 years spent in part-time work is low. The median 2016 household income was \$20,000 higher than any other cluster, as was the proportion holding management responsibilities (50%). Also, the median occupational prestige score for this cluster is highest at 61.

---Place Table 1 here---

Cluster 2. Reverse Transfer

Respondents belonging to Cluster 2 depicts 16.1% ($n=78$) of the *Paths* sample. Unlike the “university only” cluster, participants in Cluster 2 tended to enrol in universities directly from high school. However, unlike Cluster 1, they either transferred to non-university institutions after a variable period of time at university, left university to attend other types of postsecondary institutions and then returned to university immediately, or, following four or more years attending university, re-enrolled in non-university institutions later in adulthood. This is the most male dominant cluster (53% female) and is similar to Cluster 1 in terms of parental educational background, possession of the requirements to entry directly into university (the highest of all clusters at 91%), and a high median GPA (5.3). They were about 10% less likely than Cluster 1 to have graduated from metropolitan high schools but this proportion is around 11% higher than the total sample.

Education and employment and outcome patterns were unique to members of Cluster 2. Only 74% earned baccalaureate level credentials or higher by 2016, which is almost 20% lower than Cluster 1. They had spent a median 3.5 years enrolled in postsecondary institutions, 1.7 years less than those in Cluster 1. The proportion of university degree holders in Cluster 2 is 19% lower than Cluster 1, but considerably higher than in the total sample. Among degree holders, a higher proportion have spouses with bachelor’s degrees or greater compared to all participants; again, however, this proportion is lower than in Cluster 1. They spent 18.5 and 2.0 years in full- and part-time work, respectively, which is similar to Cluster 1. However, median household income in 2016 was \$80,000 which is \$5,000 higher than the overall average.

The next three clusters present pathways of individuals who did not enrol in university directly after high school.

Cluster 3. College to University Transfer

Cluster 3 highlights traditional “college to university” transfer and represents 16.3% ($n=79$) of the total *Paths* sample. Upon graduation, most individuals in this cluster enrolled in either community colleges or university colleges for one to two years and then transferred to a university. Most Cluster 3 members did not attend any postsecondary institution after several years, although small amount of re-enrolment over the life course is evident. Cluster 3 is

female dominated (67.1%). Its members are much less likely than members of Clusters 1 and 2 to have one or more parents to have university level credentials; however, this figure is slightly higher than the total *Paths* sample. Cluster 3 members were less likely to graduate from high schools in metropolitan areas: 22.8% compared to 34% of the overall sample. A slightly higher proportion graduated with the requirements for university entrance, but their GPA does not differ from the overall median.

In terms of outcomes, members of Cluster 3 spent slightly longer enrolled in postsecondary education compared to Cluster 2 (4 years) and a slightly higher proportion had earned baccalaureate degrees by 2016 (77.2%) than did those in Cluster 2. The proportion of Cluster 3 members with earned baccalaureate degrees who had spouses with university level credentials by 2016 is comparable to the entire *Paths* sample, but much lower than those in the first two clusters. Over the 28 year period, individuals in this cluster had the lowest level of full-time employment (a median 16.9 years compared to an overall average of 18.8 years) and higher levels of part-time employment (a median 4.7 years; total average 3.5 years). This does not appear to be due to extended periods of time spent in postsecondary study. Their median 2016 household income was also lower than Clusters 1 and 2 and \$5,000 lower than the median of all *Paths* respondents at \$70,000. Members of Cluster 3 had slightly lower rates of management duties in 2016 (40.2%) than the total sample, although they have a higher median occupational prestige (57) score.

Cluster 4. Mixed Bag

Cluster 4 is a “mixed bag” of postsecondary institutional attendance with notably little university participation. It is the largest among the five clusters, portraying 29.1% ($n=141$) of the sample. Institutional pathways are eclectic, with attendance in community colleges, university colleges, and technical and vocational training institutions. As sizable proportion entered directly into university colleges and either stayed for a short period of time or completed several years of study at this type of institution. Also, a large proportion of Cluster 4 members did not enter the postsecondary system directly from high school and over 28 years, spent very little time in formal postsecondary study. The gender distribution is comparable to the overall sample. Only a small proportion had one or more parent with a baccalaureate degree or higher – just 16.3% compared to 33.2% of the entire sample. Like Cluster 3, only a small proportion of individuals (19.2%) in Cluster 4 graduated from high schools in

metropolitan areas. Unlike Cluster 3, a much lower proportion in Cluster 4 graduated with the requirements for university entrance (16%) which is approximately half of total sample (33%). The median GPA of Cluster 4 members was comparably low, 4.3 compared to an overall median of 4.7.

In examining outcomes, Cluster 4 spent a short time in postsecondary education – a median 1.8 years – notably lower than any other cluster. Only one third of Cluster 4 members had earned baccalaureate degrees or higher by 2016, a rate that is almost one third less than the entire *Paths* sample. Among degree holders, a much lower proportion were in partnerships with baccalaureate degree holders by 2016 – the lowest level among all clusters. Although Cluster 4 had comparably lower levels of educational attainment and postsecondary experience, members are tied with Cluster 2 for the highest median years spent in full-time employment (20 years compared to 18.8 for the entire *Paths* sample). Median years in part-time employment is the same as the total sample. However, median 2016 household income is the lowest of all groups and considerably lower than average at \$63,805. Although a slightly higher than average proportion of individuals in Cluster 4 hold jobs with management responsibilities (48.2%), their jobs are among the lowest in occupational prestige (Blishen score=45).

Cluster 5. Mainly College, Delayed Transfer

Finally, Cluster 5 is characterised by “mainly college with delayed transfer” and captures 20.1% ($n=99$) of all respondents. The presence of later transfer to university is more pronounced than in Cluster 4, although community college attendance dominates Cluster 5. Compared to the entire sample, a slightly higher proportion of individuals in Cluster 5 are women (64.6%) and were high school graduates from metropolitan areas (37.4%). Compared to the total sample, a slightly lower proportion of Cluster 5 members have one or more parents with baccalaureate degrees or higher (27.3%). Like Cluster 4, individuals in Cluster 5 graduated from high school with a comparably lower GPA, although slightly more graduated with the requirements for university entrance – a rate that is still lower than the overall *Paths* sample.

Although Cluster 5 members spent the same median number of years in postsecondary as the overall sample, a lower proportion held baccalaureate degrees or higher by 2016 (45.4%). Like

Cluster 4, only a small proportion of degree holders were in partnerships with baccalaureate degree holders by 2016. Transfer to other institutions was predominantly to universities and often with a delay of several years. In many ways, the employment outcomes of Cluster 5 members are comparable to the entire *Paths* sample: members have almost identical median Blishen scores (52), proportion of management responsibilities (44%), and median years of full-time employment (18%). Nevertheless, individuals in Cluster 5 have slightly higher median years of part-time employment (4.4) and lower median 2016 household incomes (\$65,000). The median household income only slightly higher than Cluster 4 even though individuals in Cluster 5 tended to spend more time in postsecondary education and were more likely to earn baccalaureate degrees.

Multinomial Logistic Regression Results

We next conduct multinomial logistic regression to predict cluster membership from the demographic, education, and employment indicators discussed above. The log likelihood ratio tests for the fitted model, shown in Table 2, are statistically significant and provide evidence that the inclusion of independent variables improves the overall model fit in predicting the likelihood of respondents being in any cluster other than the reference category (i.e., Cluster 1, university only). The parameter estimates and corresponding relative risk ratios compare each cluster to Cluster 1. A relative risk ratio is interpreted as the change in the odds for each one unit change in its corresponding independent variable, holding all other indicators constant. Finally, two key assumptions of multinomial logistic regression are as follows: 1) each nominal outcome cluster does not impact the effect of independent variables in other categories and 2) outcome clusters are distinguishable. Independence of irrelevant alternative (IIA) tests were non-significant and thus indicate that the IIA assumption is not violated. Likewise, Wald tests of whether two outcomes can be combined were all significant, indicating that no clusters should be combined.

The results in Table 2 demonstrate that respondents who graduated from high schools in metropolitan areas have a lower relative risk (e.g., lower odds) of being in Clusters 3, 4 and 5. That is, graduating from a metropolitan area increased the likelihood of entering university directly. Likewise, a higher GPA decreased the relative risk of being in one of the university transfer clusters. Gender, parental education, and graduating high school with the requirements for university entrance were not statistically significant when comparing Cluster 1

to all other clusters.³ An examination of postsecondary outcomes reveals that participants who spent less time attending postsecondary institutions were more likely to be members of Clusters 2, 3 or 4. Confirming the descriptive statistics above, participants in Clusters 4 and 5 were less likely to hold baccalaureate degrees or higher by 2016. A comparison of work and income outcomes demonstrates that rates of full-time employment, household income, management responsibilities, or occupational prestige are not statistically significant when comparing Cluster 1 to all other clusters. Nevertheless, individuals in Cluster 4 have a slightly higher likelihood of part-time employment compared to Cluster 1.

Discussion and Conclusion

Educational systems can be designed to keep individuals out or to invite them in. The vertically segregated system adopted in the 1960s in British Columbia, Canada was designed to do both. The vertically segregated nature of the system sorted individuals into either non-university institutions or universities. Nevertheless, the articulation component allowed for a considerable amount of inter-institutional transfer. Over the years of the *Paths on Life's Way* project, the transfer component has expanded dramatically. As featured in Cluster 2, the nature of transfer has changed to the extent that a number of individuals have participated in reverse transfer; that is, they have transferred from universities to non-university institutions. Nowadays, it is common to consider all public postsecondary institutions within the British Columbia constellation as both sending and receiving institutions. This phenomenon was not envisioned by the original architects of the system.

To what extent do ascriptive characteristics have “dissipating” or “lingering” effects on these outcomes? According to our findings, we argue that there is evidence of both effects. Almost 96% of respondents had attended postsecondary institutions sometime between 1988 and 2016 and 59% had earned at minimum baccalaureate credentials, which could be argued to be evidence of dissipating effects. However, lower levels of participation and degree completion are reflected in comparably lower levels of median household income 28 years after high school graduation for Clusters 3, 4, and 5. Having spouses with earned bachelor's degrees or greater, known as assertive mating, is highest in Cluster 1. As such, Cluster 1

³ Statistically significant in multinomial regression is based on the cluster of comparison. For example, if Cluster 2 was chosen as the reference, there would be a significant gender and parental difference for Cluster 4.

members tend to be in high income families who are able to pool and share resources (Esping-Andersen, 2009; Schwartz, 2013, p. 452),. Also, it is an increasingly troubling form of social reproduction. Also demonstrating this cumulative impact, median occupational prestige scores are highest for the three clusters with high levels of earned baccalaureate degrees.

The lingering effect of gender is reflected in non-university participation – at least initially – which supports Charles and Bradley’s (2002) hypothesis that expansion of non-university sectors of higher education with the “ideals of universalism do more to undermine vertical segregation” (p. 574) by diverting women away from elite institutions. Our findings suggest that the gender effect is compounded by geographic location: women from urban/rural and remote communities appeared to be less likely than men to move to more metropolitan locations to commence university study directly out of high school. Frenette (2004) demonstrates that the mean earnings in Canada over a 20-year period was \$728,000 for men with baccalaureate credentials; for women with the same credentials, the figure is \$442,000. In other words, even women with earned bachelor’s degrees earn substantially less than men with the same credentials. Also, as Foley and Green (2016) point out, earnings by women with university degrees are considerably higher than earnings by women who have graduated from the non-university sector. Women with non-university credentials are even more disadvantaged and these effects are clearly lingering.

At the beginning of this paper we asked, *how does a vertically segregated articulated system of higher education have an impact on the educational, occupational, and other life course outcomes of individuals from young adulthood through to middle age?* As evidenced in varying ways for all clusters, the structure of the system facilitated both participation in and transfer among institutions, which in turn had an impact on other life outcomes. If baccalaureate degree completion serves as evidence of high academic quality and standards, then the higher education system in British Columbia, in relation to the *Paths* sample, has been a success. No less than 29% in any cluster earned this credential. However, the system works in tandem with ascriptive characteristics to determine by which cluster one is defined. Multivariate analyses highlight that high school GPA and having grown up in a metropolitan area continued to have significant effects in terms of cluster determination 28 years after high school graduation.

In closing, it must be noted that the respondents to all phases of the 28 years of the *Paths*

project could be considered the “best case scenario” in that they were all high school graduates and that the sample is slightly biased toward women, higher achievers in high school, and postsecondary graduates. Despite the limitations of the sample, differences among clusters in educational and occupational outcomes remain.

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Figure 1. Postsecondary institutional sequences of high school graduates over 28 years

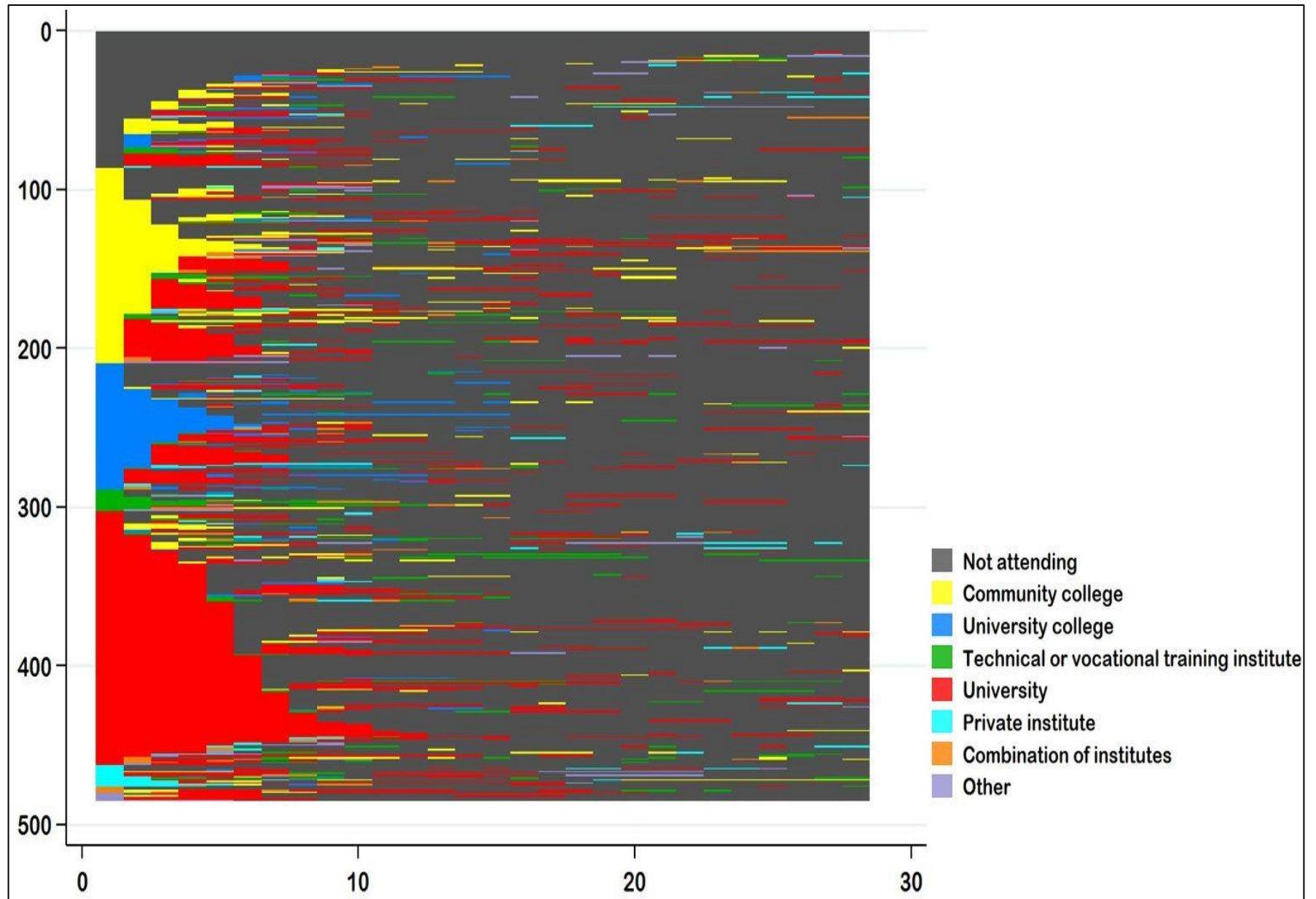


Figure 2. Postsecondary institutional sequence clusters over 28 years

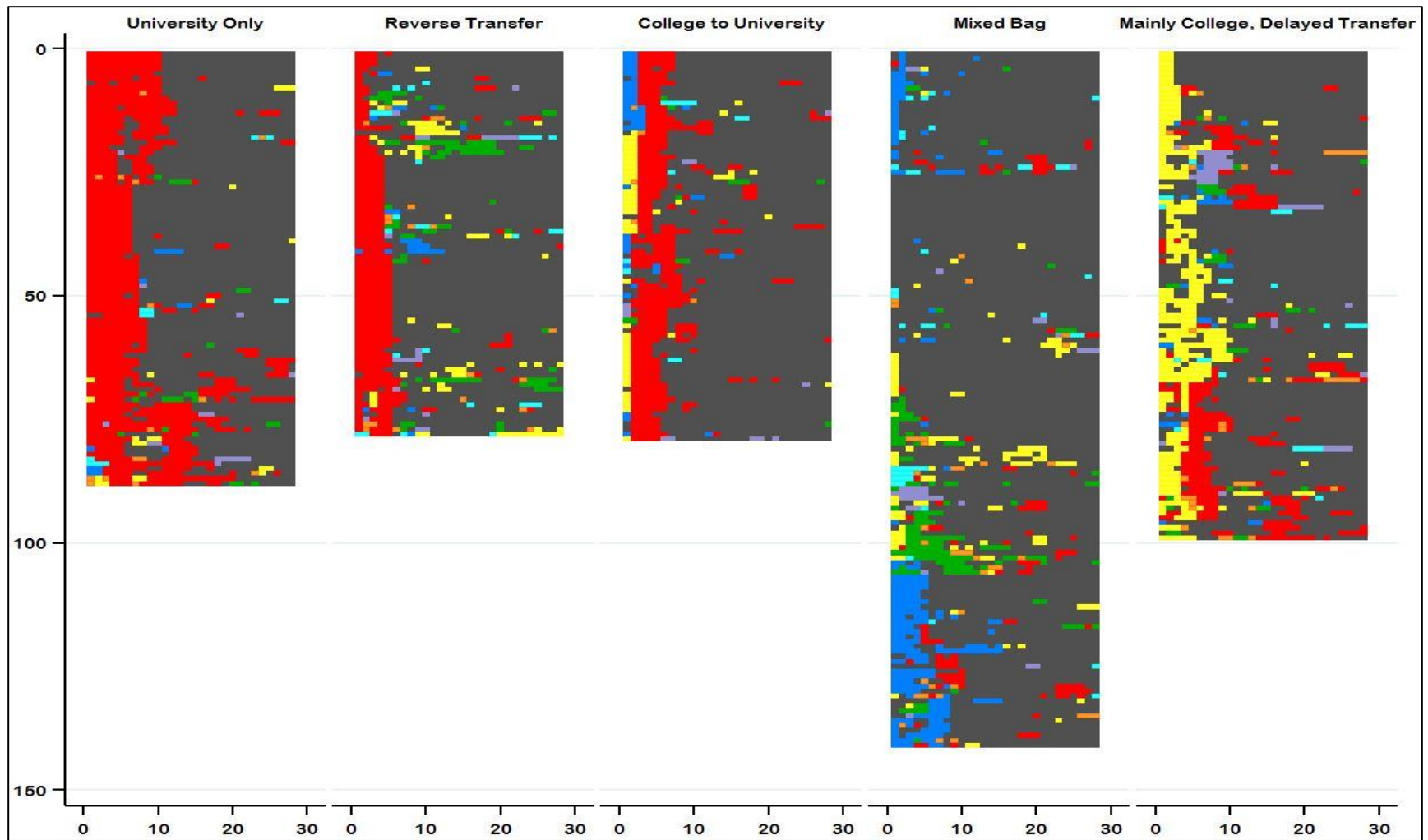


Table 1. Descriptive overview of clusters

Cluster description	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Total
Number of participants	88	78	79	141	99	485
Proportion of <i>Paths</i> sample	18.1%	16.1%	16.3%	29.1%	20.4%	-
Demographic characteristics						
Proportion of women	56.8%	52.6%	67.1%	63.8%	64.6%	61.4%
Proportion who have one or more parent with a baccalaureate degree or higher	52.3%	47.4%	35.4%	16.3%	27.3%	33.2%
Proportion who graduated from a high school in a metropolitan area	54.5%	44.9%	22.8%	19.2%	37.4%	34.0%
High school outcomes						
Proportion who graduated with the requirements for university entrance	87.5%	91.0%	80.8%	53.2%	61.6%	71.8%
Median GPA ¹	5.7	5.3	4.7	4.3	4.3	4.7
Postsecondary education outcomes						
Median years of part-time or full-time postsecondary education ²	5.2	3.5	4.0	1.8	3.8	3.9
Proportion with a baccalaureate degree or higher by 2016	93.2%	74.4%	77.2%	29.1%	45.4%	59.2%
Proportion with baccalaureate degree or higher in a partnership with a baccalaureate degree holder by 2016	62.5%	43.6%	31.6%	14.9%	21.2%	32.2%
Work and income outcomes						
Median years of full-time employment	18.5	20.0	16.9	20.0	18.2	18.8
Median years of part-time employment	2.7	2.0	4.7	3.5	4.4	3.5
Median 2016 household income ³	\$100,000	\$80,000	\$70,000	\$63,805	\$65,000	\$75,000
Proportion with management responsibilities (current/most recent 2016 job)	50.0%	34.6%	40.2%	48.2%	44.4%	44.3%
Median Blisshen score (current or most recent 2010 job) ⁴	61	55	57	45	52	52

¹ Range 1 to 6

² Full-time=1 month, part-time=.5 month

³ Self-reported estimation of total household income before taxes and deductions adjusted by the square root of household size (OECD, 2011).

⁴ Range 23 to 102

Table 2. Multinomial Logistic Regression Comparing Cluster 1 to All Other Clusters

	Cluster 2		Cluster 3		Cluster 4		Cluster 5	
	Coef. (std.err)	Relative risk	Coef. (std.err)	Relative risk	Coef. (std.err)	Relative risk	Coef. (std.err)	Relative risk
Demographic characteristics								
Gender (women=1)	-0.428 (0.418)		-0.247 (0.442)		0.412 (0.452)		0.333 (0.446)	
Parental education (have baccalaureate degree or higher=1)	0.114 (0.386)		0.103 (0.400)		-0.703 (0.434)		-0.513 (0.422)	
Location of high school graduation (metropolitan area=1)	-0.234 (0.396)		-1.881*** (0.442)	.152	-1.946*** (0.450)	.142	-1.126** (0.426)	.324
High school outcomes								
Graduated HS with the requirements for university entrance (Yes=1)	0.807 (0.694)		-0.119 (0.624)		-0.09 (0.603)		-0.388 (0.591)	
GPA ¹	-0.273 (0.305)		-1.387*** (0.295)	.249	-1.526*** (0.300)	.217	-1.817*** (0.298)	.163
Postsecondary education outcomes								
Years of part-time or full-time postsecondary education ²	-0.526*** (0.114)	.591	-0.306** (0.098)	.737	-0.627*** (0.117)	.534	-0.183 (0.098)	
Baccalaureate degree or higher by 2016 (yes=1)	-0.281 (0.644)		0.183 (0.645)		-1.323* (0.655)	.266	-1.591* (0.639)	.204
Participant with degree or higher in a partnership with a degree holder by 2016 (yes=1)	-0.250 (0.418)		-0.756 (0.437)		0.098 (0.504)		-0.312 (0.486)	
Work and income outcomes								
Years of full-time employment	0.016 (0.051)		-0.026 (0.050)		0.038 (0.052)		0.035 (0.052)	
Years of part-time employment	0.065 (0.064)		0.119 (0.064)		0.157* (0.065)	1.170	0.126 (0.067)	
2016 household income in thousands of dollars ³	-0.001 (0.002)		-0.001 (0.003)		-0.002 (0.004)		-0.004 (0.004)	
Current/most recent 2016 job has management responsibilities (yes=1)	-0.574 (0.375)		-0.010 (0.385)		0.304 (0.393)		0.009 (0.391)	
Blishen score for current or most recent 2010 job ⁴	-0.014 (0.015)		0.018 (0.015)		-0.001 (0.016)		0.010 (0.016)	
Intercept	4.408* (2.204)		8.991*** (2.116)		11.309*** (2.163)		10.680*** (2.147)	

* $p < .05$, ** $p < .01$, *** $p < .001$; $N=450$; McFadden's Adjusted $R^2=0.26$; $\chi^2_{(52)}=362.6$, $p < .001$

¹ Range 1 to 6

² Full-time=1 month, part-time=.5 month

³ Self-reported estimation of total household income (before taxes and deductions) adjusted for household size.

⁴ Range 23 to 102