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Descriptive Finding

Internal migration and the de-standardization of the life course: A sequence analysis of reasons for migrating

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Abstract

BACKGROUND
The life-course perspective has become one of the main paradigms in migration research, providing a rich and fruitful framework for understanding migration behavior. Despite a large literature on the association between internal migration and life-course transitions, little effort has been made to understand the impact of increasing diversity in the life-course trajectory of young adults on heterogeneity in migration behavior.

OBJECTIVES
To address this gap, this paper seeks to establish intra- and inter-cohort variation in the occurrence, order, and timing of reasons for migrating among young adults.

METHODS
We apply sequence and cluster analysis to self-reported reasons for migrating collected from 2002 to 2019 as part of the Household Income and Labour Dynamics in Australia (HILDA) survey and follow two cohorts of young adults born between 1982–1984 and 1990–1992 over 10 years. We distinguish between education, employment, family, housing, amenity, lifestyle, and health migration.

RESULTS
Sequence analysis reveals diversity in individual migration trajectories, shaped by the number and timing of migrations and the type of reason. Intra-cohort variation is manifested by the delineation of five distinct migration clusters, while inter-cohort change is most visible in the growing share of young adults that follow diverse and delayed migration trajectories.

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CONCLUSIONS
Sequence analysis is a promising tool to advance understanding of migration behavior, which can now find greater usage thanks to the maturation of longitudinal surveys.

CONTRIBUTION
Analyzing migration histories over a sustained period reveals greater heterogeneity in migration behavior than focusing on single migration events. This reinforces the importance of conceptualizing and analyzing migration as a life-course trajectory that unfolds over time.

1. Introduction

It is well established that migration – both within and between countries – varies with age: the intensity of migration peaks at young adult ages and declines thereafter (Rogers and Castro 1981; Wilson 2010). This quasi-universal nexus between age and migration has been explained by the association between migration and life-course transitions. Young adulthood is indeed a "demographically dense" period of the life course (Rindfuss 1991) when key transitions in the family and work spheres occur. Shifting individual and household needs and preferences often cause a mismatch between current and desired place of residence, which in turn leads to a migration (Horowitz and Entwisle 2021; Mulder and Hooimeijer 1999). Hence, a large literature has accumulated on the links between internal migration and education completion (Bernard, Bell, and Charles-Edwards 2016; Machin, Salvanes, and Pelkonen 2012; Mulder, Clark, and Wagner 2002), childbearing (Kulu 2008), employment (Detang-Dessendre and Molho 1999), union dissolution (Boyle et al. 2008; Spring et al. 2021; Thomas, Mulder, and Cooke 2017), and retirement (Rogers 1988, 1990). Because of the strength of these associations, the age structure of internal migration broadly mirrors the age structure of the life course in countries around the world (Bernard, Bell, and Charles-Edwards 2014). The association between internal migration and life-course transitions also transpires in the age distribution of self-reported reasons of moving. Education dominates young adulthood and is progressively replaced by employment-related motives, which often occur alongside family-related reasons in the late 20s to mid-30s (Niedomysl 2011).

While this literature has yielded important insights into the intricacy of migration behavior, particularly among young adults (Finney 2011; Pelikh and Kulu 2018), it has been operationalized mainly through event history analysis. This means that most studies, including those drawing on longitudinal data, resort to analyzing migration using person-years as the unit of analysis rather than individuals. This snapshot approach stands in stark contrast to the idea that individuals' lives are long-term biographies that unfold over

many years (Halfacree and Boyle 1993). It is also at odds with the growing recognition that migration should be viewed as a trajectory that unfolds over the life course of individuals rather than a series of discrete events (Bernard and Perales 2021; Coulter, Van Ham, and Findlay 2016). More importantly, it does not permit gauging diversity in the order and timing of reasons for moving over the life course.

This is problematic because of the progressive de-standardization of the life course (Brückner and Mayer 2005; Elzinga and Liefbroer 2007). This process refers to increasing diversity in the life-course trajectory of young adults because of (1) greater variability in the timing and ordering of family-life trajectories, (2) the weakening of the domination of specific life-course transitions such as marriage, and (3) a progressive decoupling of employment and family-related transitions. However, it is unclear how these changes intersect with migration and have shaped migration behavior. One of the rare attempts to address this question has been the application of multi-channel sequence analysis to characterize internal migration behavior in combination with family and employment-related transitions across the young adult lives of three birth cohorts in Western Germany (Vidal and Lutz 2018). The study reveals increased diversity in internal migration trajectories linked to delayed life-course transitions. While promising, this approach is analytically cumbersome as it yields numerous outputs that are not intuitively interpretable, and thus it has found limited usage in the migration literature. In addition, it only indirectly links internal migration and life-course transitions by comparing the timing of migration relative to that of life-course transitions. As a result, the internal migration literature has not fully incorporated insights from the life-course perspective.

Yet, it is reasonable to posit that the de-standardization of the life course should be reflected in the mix of reasons for migrating. In particular, one would expect increased diversity in the ordering and timing of moves motivated by employment and family reasons because of a progressive decoupling of employment and family-related transitions (Huinink 2013). To test this hypothesis and shed new light on internal migration behavior, this paper explores how diverse the sequencing of reasons for migrating in young adulthood is. To that end, the paper applies sequence and cluster analysis to self-reported reasons for migrating collected from 2002 to 2019 as part of the Household Income and Labour Dynamics in Australia (HILDA) survey and follows young adults born between 1982–1984 and 1990–1992 over a 10-year period. Australia is an ideal case-study country, because, albeit experiencing a decline in the rate of internal migration (Kalemba et al. 2020), it remains a high-mobility country by global standards. About 40% of its population change address every five years (Bell et al. 2015), resulting in a high level of repeat migration (Bernard et al. 2017). Furthermore, the dominance of non-economic reasons for migrating internally, such as family and lifestyle, even over long distances (Thomas, Gillespie, and Lomax 2019), permits the analysis of a diverse

mix of reasons for migrating – more so than in countries where employment is the main reason for migrating.

The next section outlines the data and methods used. Section 3 presents the results, including the socioeconomic profile of each migration cluster. Section 4 concludes by discussing how the results open avenues for future research.

2. The Household Income and Labour Dynamics in Australia (HILDA) survey

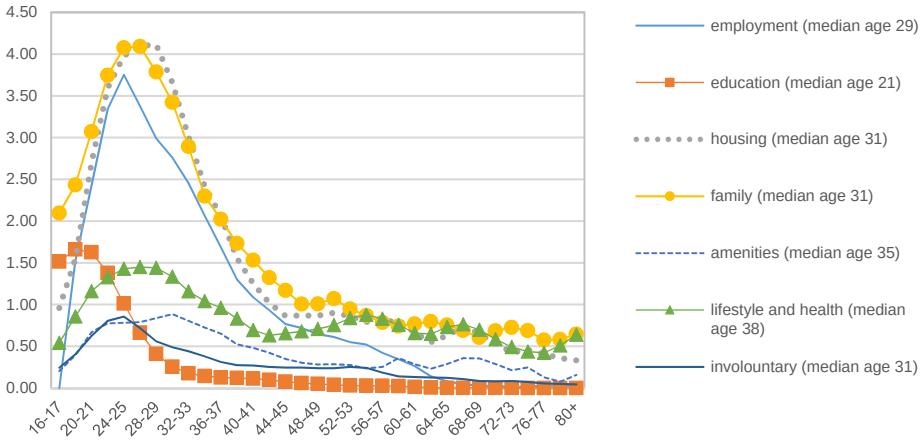
HILDA is a longitudinal survey representative of the Australian population aged 15 and over living in private households. Initiated in 2001, HILDA has annually collected social, economic, and demographic information on the lives of about 17,000 Australians aged 15 years and over. While HILDA collects reasons for moving for all changes of address, the paper focuses on migration between SA4s (n = 87). SA4s are the second-level division after states and territories under the Australian Standard Geographical Classification (ASGC) and broadly correspond to economic regions. This level of geography is commonly used in Australia to capture internal migration – that is, a change of residence that severs social ties, as opposed to residential mobility, which is typically measured as a change of residence within an SA4 and does not entail changes to one's social networks (Kalemba et al. 2020; Raymer and Baffour 2018). HILDA has the unique advantage of having continuously collected reasons for migrating within Australia since 2002. While reasons for moving face a number of methodological and conceptual limitations, particularly around ex-post rationalization (Gillespie, Mulder, and Eggleston 2021), they offer unique insights into migration behavior.

HILDA respondents who have changed address in the preceding 12 months can select multiple reasons for having moved from a list of 30. For ease of interpretation, we have grouped reasons for moving into eight mutually exclusive categories, namely employment,[3] housing,[4] education, family,[5] amenities,[6] lifestyle/health,[7] and involuntary moves.[8] Reason-specific migration rates in Figure 1 show a clear age stratification, with education-related migration reaching a peak in the early 20s and declining thereafter. Employment, family, and housing-related migration are also strongly age-graded,

[3] Employment includes: the start of a new job with a new employer, work transfer, to look for work, to be nearer place of work, to start own business, to relocate own business, and other work reasons.
[4] Housing includes: to get a larger or better place, to get a smaller or less expensive place, to get a place of/on my/our own.
[5] Family includes: to get married or moved in with partner, marital breakdown, to be close to family and friends, to follow a spouse or parent, and other family or personal reasons.
[6] Amenities include: to be closer to amenities or services or public transport, neighbourhood reason, or to live in a better neighbourhood.
[7] Lifestyle and health include: seeking change of lifestyle, and health reasons.
[8] Involuntary includes: property no longer available, evicted, government housing, and temporary relocation.

although employment peaks earlier in the mid-20s and is concentrated around a narrower age range. Family and housing migration report the highest intensity at the peak and remain the top two reasons up to the mid-50s. By contrast, lifestyle, health, and amenity-driven migration are spread across a broader age range and display significantly lower rates. While insightful, this cross-sectional overview tells us little about the succession of different reasons for migrating. Some individuals may migrate only for education and employment. Others may migrate for an employment reason followed by a family motive, while for some individuals family-related moves may take place before employment migration.

Figure 1: Reason-specific migration rates by age group



Source: HILDA 2002–2019, authors' calculations.
Note: Kernel regression used to smooth the data.

To understand how reasons for migrating precede one another in sequenced relationships and to establish changes over time, we restrict the analysis to two cohorts of young adults aged 18 to 20 in 2002 and in 2010, which correspond to the 1982–1984 and the 1990–1992 birth cohorts. We follow their migration behavior over 10 years until their reach the ages of 27 to 29 in 2011 for the first cohort and in 2019 for the second cohort. The migration history of each cohort is summarized in Table 1. During the observation period, the proportion of non-migrants decreased from close to 57% for the 1982–1984 cohort to 52% for the 1990–1992 cohort. While the proportion of one-time migrants remained stable at around 18%, the share of repeat migrants increased slightly from 25% to 29%. The mix of reasons for migrating also shifted, with the proportion of

individuals migrating for employment and housing reasons decreasing in favor of family, education, and involuntary migration. Because we are interested in the relative timing and order of reasons for migrating, the remainder of the analysis is restricted to individuals who migrated at least twice with no missing waves (n = 305). This allows us to assess whether migration trajectories have become more diverse using sequence analysis.

Table 1: Migration histories from ages 18–20 to 27–29 by birth cohort

	1982–1984 birth cohort (n = 720)	1990–1992 birth cohort (n = 915)
Average number of migrations	0.89	1.03
Did not migrate (%)	56.82	52.03
Migrated once (%)	18.19	18.77
Migrated twice (%)	12.99	14.58
Migrated three times + (%)	12.00	14.62
% who migrated at least once for:		
Employment	17.64	15.45
Housing	22.00	14.98
Family	6.88	10.66
Education	6.66	7.96
Amenities	3.63	3.46
Lifestyle and health	4.60	4.03
Involuntary	3.99	5.76

Source: HILDA 2002-2019, authors' calculations.

3. Sequence analysis

Since its appearance two decades ago (Abbott and Tsay 2000; Stovel, Savage, and Bearman 1996), sequence analysis has been commonly used in the social sciences, but has been rarely employed in migration research, despite a few applications (Coulter, Van Ham, and Feijten 2011; Karhula et al. 2020; Stovel and Bolan 2004; Vidal and Lutz 2018). This is mainly because of data constraints, but the maturation of longitudinal surveys allows us to harness sequence analysis to the HILDA survey to elucidate how reasons for moving preceded one another in sequenced relationships. To that end, we organize the data in a matrix format with reasons for moving in consecutive columns for

each year.[9] Thus, each year individuals fall in one of 8 possible states: never migrated or one of the 7 possible reasons for migrating. Once an individual has migrated the respondent remains classified based on the last reason for migrating until his or her next migration. This operationalization based on a limited number of conceptually distinct states, rather than events, ensures analytical clarity by limiting the number of possible combinations that would have been caused by the high incidence of immobility in any given year. It also facilitates visual interpretation by focusing on the order of reasons, as in papers that examine the order of internal versus international migration and rural versus urban migration (Stovel and Bolan 2004; Zufferey, Steiner, and Ruedin 2021).

To explore how reasons for migrating precede one another over the entire observation period and shed light on the relative order of reasons for migration, we then group individual migration trajectories into clusters based on an optimal matching algorithm that maximizes differences between groups and minimizes dissimilarity within them by comparing each respondent's sequences of state to that of all other respondents (Brzinsky-Fay, Kohler, and Luniak 2006). We use the Needleman-Wunsch algorithm to find the alignment between two sequences that have the lowest Levenshtein distance. The distance associated with transforming one sequence into the other is obtained via a series of insertions, deletions, and substitutions.[10] Because of the possible impact of methodological choices on the consistency of substantive findings (Warren et al. 2015; Wu 2000), we estimate another dissimilarity matrix with an alternative measure, the Hamming distance, which is commonly used in sequence analysis (Lesnard 2010). Pearson's correlation between the two distance matrices returns a coefficient of 0.84, which suggests that the empirical results are robust to model specification.

We then apply Ward's hierarchical cluster analysis to the resulting matrix of dissimilarity and select a 5-cluster solution that provides an optimal empirical fit while offering sufficient cluster sizes for statistical inference. Figure 2 reports results in the form of sequence index plots, which helps distinguish the migration behaviour of each

[9] A total of 21% of the sample reported more than one reason for moving, with no ranking. For sequence analysis only one reason can be reported each year, so we re-arrange the data to that effect. One of the most common combinations is housing within another reason such as employment and family. In that case, we select the reason other than housing because changes in housing needs are often the consequence of another reason, such as the birth of a child. Along the same lines, we select family reasons over amenities and lifestyle reasons because family changes are likely to be the root cause of changes in amenity needs and lifestyle preferences. Similarly, when involuntary migration has been selected in combination with another reason, we select the other reason as it provides more insight into motives for moving. These three rules address over 65% of instances with multiple reasons. Finally, education and employment are chosen when they have been selected in conjunction with another reason. We go back to this limitation in the conclusion.

[10] We use the default setting in STATA 13. The cost attached to an insertion or deletion of an alignment is 1. The cost attached to a substitution in an alignment is twice the value of an insertion or deletion. We are cognisant of the fact that the assignment of transformation costs is a challenge because of the absence of a theoretical or applied basis for setting those costs (Stovel, Savage, and Bearman 1996; Abbott and Tsay 2000), particularly in the migration literature where sequence analysis remains rare.

cluster. Each horizontal line represents the migration history of an individual and the colors represent one of the eight possible states each year. For comprehensiveness, in column (b) of Figure 2 we also report the sequences of events, which permits the identification of periods of immobility. Clusters are ranked in decreasing order of their share in the sample. We complement insights from Figure 2 with a series of descriptive statistics that relate to the occurrence and timing of migration events in Table 2. Finally, Table 3 reports key socioeconomic characteristics by cluster membership.

Cluster 1 features family-related migration trajectories, although over a third of this cluster also migrated from employment motives. This is the most common cluster. It accounts for over 28% of the sample, but its share decreased by more than 10 percentage points between the two birth cohorts. As a result, it fell from being the most common cluster among members of the 1982–1984 cohort to the third most common after clusters 1 and 3 for the 1990–1992 birth cohort. Members of this cluster are more likely to be females, low-income earners, and individuals not in the labor force.

The results suggest a second cluster of delayed and diverse migration trajectories. This cluster displays the oldest mean age at first migration (23.77 years) combined with the lowest average number of migrations (2.45). In contrast to other clusters, this migration trajectory is not dominated by a single motive but instead features a mix of reasons, primarily family and employment. At the same time, this cluster displays the highest share of lifestyle, health, and amenities-related migration, as well as involuntary migration. It is more commonly found among men, middle-income earners, and unpartnered individuals. Cluster 2 accounts for 27% of the sample, but its share has increased by 7 percentage points between the two cohorts. It accounts for over 30% of the 1990–1992 cohort and is the most common migration trajectory for members of that birth cohort.

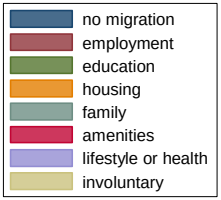
By contrast, Cluster 3 features housing-dominated migration trajectories, with the majority of members migrating for housing reasons multiple times, as shown by state sequences in column (b). This cluster displays the highest average of non-career-related migrations (2.65). Most members also migrated for other reasons, primarily family motives, and as a result they display the second-highest average number of migrations (3.07) and the second oldest mean age at first migration (22.21 years). Members of this cluster are less likely to have tertiary education than the other clusters and more likely to be female. Representing close to 20% of the sample, migration trajectory is proportionally more common among members of the 1990–1992 birth cohort than the 1982–1984 cohort.

Cluster 4 stands out with the domination of employment-related migration. It is also the most mobile cluster, with an average of 3.34 migrations over 10 years, and has the youngest mean age at first migration (20.87 years). This cluster displays the second-highest proportion of members who migrated for education reasons and the lowest share

that migrated for housing, lifestyle, health, or amenity reasons. While it accounted for over 23% of the 1982–1994 cohort it represents only 11% of the 1990–1992 cohort, which is likely to reflect a delayed entry into the labor market. Such migration trajectory is more commonly found among middle and high-income earners. Members of this cluster are also more likely to be employed.

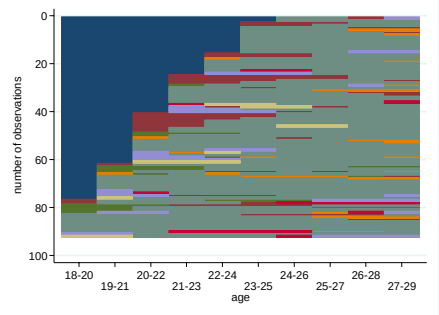
Comprising over 8% of the sample, the last cluster represents the least common trajectory, one that is dominated by education-related migration. With an average of career-related migrations close to 1.8, the second highest in the sample, many cluster members migrated for education-related reasons multiple times, as shown by the state sequences in column (b). Some members also migrated for employment and family reasons, typically after an education-related migration. This cluster displays the second-youngest age profile, with a mean age at first migration of 20.98, but, in contrast to other clusters, most members remained immobile in their mid-20s, which presumably corresponds to a period of enrollment in a tertiary institution. The share of this cluster nearly doubled to account for over 10% of the 1990–1992 birth cohort. Unsurprisingly, members of this cluster display the highest level of tertiary education and employment.

Figure 2: Sequence index plot by cluster



C1. Family-orientated migration trajectories

Sequence of states



Sequence of events

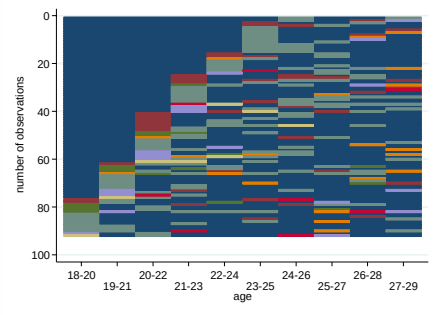
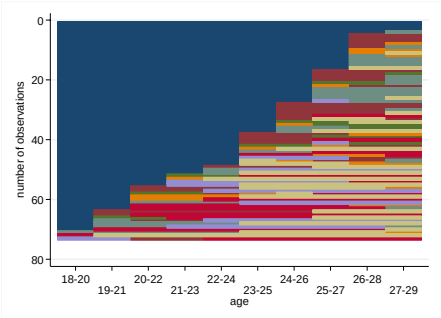


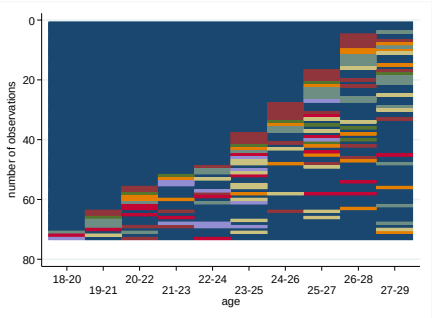
Figure 2: (Continued)

C2. Diverse and delayed migration trajectories

Sequence of states

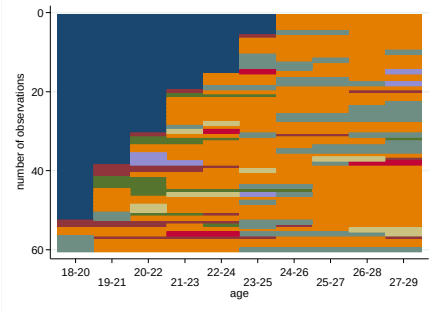


Sequence of events



C3. Housing-family migration trajectories

Sequence of states



Sequence of events

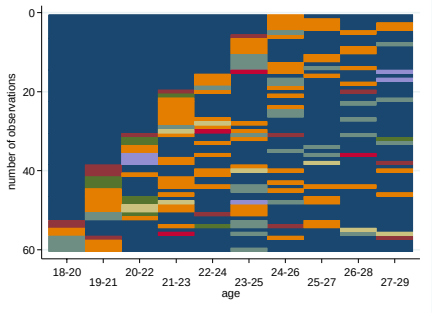
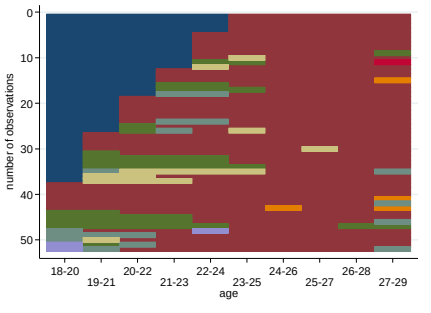


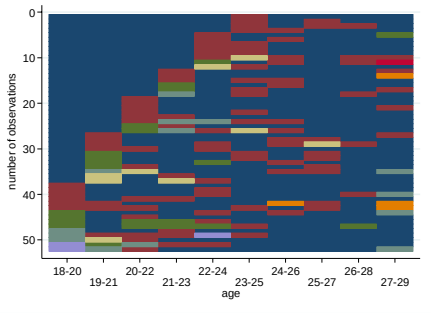
Figure 2: (Continued)

C4. Employment-led migration trajectories

Sequence of states

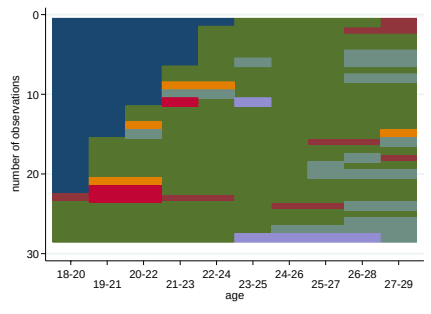


Sequence of events



C5. Early, education-dominated migration trajectories

Sequence of states



Sequence of events

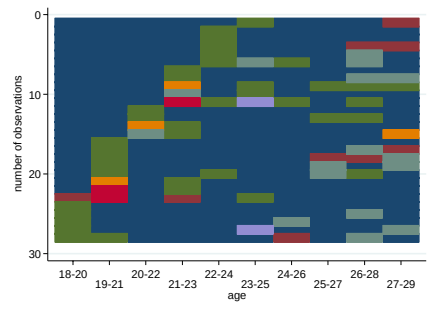


Table 2: Migration attributes by cluster

	C1 Family-orientated migration trajectories	C2. Diverse and delayed migration trajectories	C3. Housing-family migration trajectories	C4. Employment-led migration trajectories	C5. Early, education-dominated migration trajectories
% of the sample	28.53	27.00	19.49	16.86	8.11
Sample size, unweighted (n=)	92	73	60	52	28
Mean age at first migration (years)	21.24	23.77	22.21	20.87	20.98
Average number of migrations	2.99	2.45	3.03	3.34	2.79
Average number of career-related migrations*	0.68	0.66	0.38	2.53	1.63
Average number of non-career related migrations**	2.31	1.79	2.65	0.81	1.16
% who migrated for education	13.51	16.51	16.39	31.44	100.00
% who migrated for housing	18.05	25.71	100.00	5.27	10.87
% who migrated for employment	39.05	37.71	14.69	100.00	23.93
% who migrated for family	100.00	40.10	48.74	16.76	38.52
% who migrated for lifestyle, health, or amenities	27.51	29.07	13.21	4.70	10.89
% who migrated involuntarily	5.56	28.76	18.45	14.24	7.11
% distribution within the 1982–1984 cohort	33.68	23.39	14.09	23.23	5.61
% distribution within the 1990–1992 cohort	23.92	30.24	24.33	11.15	10.35

Source: HILDA, 2002–2019, authors' calculations.
Note: * includes education and employment reasons
** includes housing, family, lifestyle, health, amenities, or involuntary reasons.

Table 3: Socioeconomic characteristics by cluster, percentages

	C1 Family-orientated migration trajectories	C2. Diverse and delayed migration trajectories	C3. Housing-family migration trajectories	C4. Employment-led migration trajectories	C5. Early, education-dominated migration trajectories
Demographic characteristics					
Female	59.78	36.99	60.00	46.15	53.57
Marital and parental status					
Partnered	66.30	36.99	40.00	53.85	46.43
Has children	35.87	21.92	33.33	28.85	7.14
Education and employment statuses					
Tertiary educated	38.46	36.99	31.67	44.23	78.57
Employed	74.73	84.51	81.67	90.31	92.86
Unemployed	4.40	5.63	1.67	1.92	3.57
Not in the labor force	20.88	9.86	16.67	5.77	3.57
Income quintile					
1st	21.74	13.70	11.67	9.62	10.71
2nd	21.74	23.29	23.33	15.38	21.43
3rd	22.83	23.29	15.00	28.85	25.00
4th	13.04	21.92	30.00	19.23	17.86
5th	20.65	17.81	20.00	26.92	25.00

Source: HILDA, 2002–2019, authors' calculations.
Note: *** p<0.01, ** p<0.05, * p<0.1
All dependent variables are measured at the end of the observation period except sex, which is fixed.

4. Conclusion

Our sequence analysis of migration histories has revealed diverse internal migration trajectories shaped by differences in the number of migrations, the age at which they occur, the type of reason for migrating, and their relative order. This longitudinal approach to migration has revealed heterogeneity in migration behavior in young adulthood that is missed in cross-sectional approaches. Intra-cohort variation in internal migration behavior is manifested in (1) the high incidence of immobility coupled with a high level of repeat migration in Table 1, and (2) the delineation of 5 distinct migration clusters among repeat migrants in Table 2. Inter-cohort variation is most visible in the growing share of young adults who follow a diverse and delayed migration trajectory. At the same time, the declining share of young adults on an employment-focused migration pathway coupled with the rise in education-dominated migration trajectories is likely to

be linked to a delayed entry into the labor market as a result of increased educational attainment.

Because of data constraints, we could only explore differences between two birth cohorts. However, the maturation of the British Household Panel Survey, initiated in 1991, and which has now been replaced by Understanding Society, the UK Household Longitudinal Study (UKHLS), should permit the analysis of migration behaviour of birth cohorts dating back to the 1970s (Pelikh 2019; Pelikh and Kulu 2018). Another promising avenue for future research with UKHLS and other long-running panel surveys is to extend sequence analysis of reasons for migration to longer observation periods. Because our analysis covers only a 10-year period and stops before age 30, many respondents are yet to experience family transitions, which limits opportunities to capture variability in the timing and order of family-life trajectories. Another direction for future research is to focus on the de-coupling of family and employment transitions, which is an important aspect of the de-standardization of the life course. This can be achieved by restricting attention to individuals who migrated at least once for an employment motive. This approach should allow establishing how the relative order of family and employment migrations has evolved. In the meantime, our paper reaffirms the need to conceptualize and analyze migration as a trajectory in order to more robustly incorporate insights from the life-course perspective in migration research, and it hopes to provide an impetus for sequence analysis of reasons for migration.

While promising, this line of inquiry faces the limitations of current practices in collecting self-reported reasons for migration. One challenge is to reconcile the collection of multiple reasons with the sequence analysis requirement that respondents belong to mutually exclusive categories. A possible solution is for surveys to ask respondents to rank reasons for migration, which would guide researchers as to how to handle multiple reasons (see footnote 1). A second limitation stems from reasons for staying not being collected. Individuals may migrate for a family reason but then choose to stay in the same location for employment reasons, which is not captured in existing datasets. If collected, reasons for staying could be incorporated in sequence analysis to provide a more robust account of migration choices. These limitations reinforce the need for event history analysis and sequence analysis to proceed in tandem, as they provide complementary insights into the links between internal migration and life-course transitions.

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