Migration from megacities to other areas: Analysis of behavioral changes by incorporating the interrelationships across life domains[1]

Junyi ZHANG[2], Yubing XIONG, Ying JIANG, Nobuhito TANAKA, Hiroshima University;

Nobuaki OHMORI, Utsunomiya University; Ayako TANIGUCHI, University of Tsukuba.

Abstract

In Japan, many people (especially young people) have continued to migrate for work and residence from local cities to the three metropolitan areas (Tokyo, Osaka and Nagoya regions), where around half of the nation's population is now concentrated. The Japanese government has taken various measures (mainly related to various infrastructures) to revitalize economy in local cities since 1980s. However, the above migration pattern has not stopped. Therefore, it is important to understand how to encourage people's behavioral changes in migration. On the other hand, decisions on various life choices (e.g., migration and residence, employment, and family life) are more or less interdependent, as argued by the life-oriented approach. With the above consideration, this research aims to figure out how to encourage the working Japanese people in megacities to migrate to local cities by focusing on behavioral changes related to migration and some typical life choices. For this purpose, we first extended the theory of planned behavior to deal with multiple life domains and designed a questionnaire, and then conducted the survey on the Internet with the working population (1,000 respondents) of the Tokyo Capital Area in December 2015. Among all the respondents, only 8.7% intended to move to other places in Japan, among which about 80% are likely to change their dwellings, but only 46% and 40% are likely to change their jobs and child rearing, respectively. The higher inconsistency with job and child rearing further lower the possibility of people's migration into local cities, suggesting a difficulty in resolving the fundamental issues caused by the overconcentration of the Japanese population. We further estimated a structural equation model and empirically confirmed significant correlations of migration intentions with intentions about jobs, dwellings, and child rearing, and the intention to change dwelling has the strongest influence on the intention to migrate. To the best of our knowledge, this is the first study to reveal such interrelated behavioral changes in multiple life domains associated with migration.

1. MIGRATION-RELATED URBAN ISSUES

Migration has always been a fundamental component of human history (Lee, 1966; Kniveton et al., 2011) and has been studied in various disciplines such as regional economics, demography, sociology, and geography (Chi and Voss, 2005). People migrate for various reasons (e.g., work, study, and marriage) from village to village, from village to city, from city to city, and from country to country, while the outcomes of migration may be either prosperity or misery for people and/or for society. An examination of global urban development practices suggests that cities with various population sizes can be economically prosperous. However, cities of different sizes may need to achieve sustainable development in different ways, and migration is clearly a major factor in determining city size. In reality, various optimal/ideal city sizes may be possible depending on how the notion of "optimal" or "ideal" is

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[1] This is replicated from Zhang et al. (2016).
[2] Corresponding author: zjy@hiroshima-u.ac.jp

defined. This book describes people's life choices at the individual/household level. Migration that is optimal or ideal for an individual or a household is not necessarily so for society. As stated in Chi and Voss (2005), "migration is a large concern for policy makers because flows of population can significantly affect local political, social, economic, and ecological structures for both sending and receiving areas (p.11)."

According to Globalization101.org (2013), flows of goods and capital across countries have driven globalization, which has stimulated international migration. Currently, international migrants account for about 3% of the world's population and would form a country with the world's fifth largest population if they all lived in the same place. The main motivation for international migration is economic factors, and other motivations come from civil strife, war, and political and religious persecution as well as environmental problems (e.g., natural disasters). At the national level, overconcentration of populations in many megacities across the world (e.g., Tokyo, Jakarta, Manila, Seoul, Shanghai, Karachi, Beijing, New York, Mexico City, Mumbai, and New Delhi) has caused various urban development and social issues. In Japan, as an Asian model of a prosperous country, the majority of young people have continued to migrate for work and residence from small cities to the three metropolitan areas (Tokyo, Osaka and Nagoya regions), where around half of the nation's population is now concentrated. As a result, many small cities in Japan now face serious population issues, for example, an ever-increasing proportion of elderly people, difficulties in ensuring mobility for elderly people, and insufficient support for child rearing and women's labor participation. It is predicted that many of these small cities will disappear in future if their current situations cannot be improved.

Similar issues to those caused by migration in Japan can be observed in other developed countries. Smith and Sage (2014) found that the long-distance movement of young adults is a leading cause of demographic and population changes in England and Wales. Muilu and Rusanen (2003) showed empirically that without the support of the young population, small areas, especially remote rural areas, cannot remain viable or maintain their economic functions in the long term. Thissen et al. (2010) argued that "together with the ageing of the European population, youth migration related to the transition from secondary to higher education is increasingly responsible for the declining numbers of young people in rural areas (p. 435)." Using 1970–2000 US Census data, Chen and Rosenthal (2008) revealed that young and highly educated households, especially highly educated couples, are more likely to move to cities with higher quality business environments. Thissen et al. (2010) found that local attachments appear to be the most important factor explaining youths' migration intentions. Other factors include their social background, migration history, and perceptions of employment opportunities, even though there are obvious regional differences caused by the structure, culture, and landscape of the regions. Ek et al. (2008) reported that if living conditions (educational and vocational opportunities) could not be improved and psychosocial resources (lack of social support, passive coping strategies, and greater pessimism) of young adults in rural and remote areas of Northern Finland could not be enhanced, young adults would continue to out-migrate to cities. Interestingly, Vilhelmson and Thulin (2013) found that most young adults in Sweden have integrated the Internet into their migration decision-making processes—from the formation of vague plans and thoughts, to more active plans and actual moves. The Internet reinforces many recent movers' migration motives and intentions, and facilitates their decisions to move and choices of destinations. On the other hand, the counter-urbanization phenomenon has been observed in some European countries. Bijker et al. (2012) found that people in the north of the Netherlands who migrated to less popular rural areas were mainly young; many of them were employed and highly educated, most of them had simply returned to their original rural areas, and only a small percentage had moved from urban areas. Bijker et al. concluded that the migrants in their study were most similar to the migrants to the fringe areas of Denmark.

Out-migration by young people to cities is also common in developing countries. Childs et al. (2014) revealed that communities that had thrived for centuries in Nepal's rugged mountain environments are facing rapid population declines caused by the out-migration of youth, and this posed a potential long-term threat to agricultural production, the family-based care system for the elderly, socioeconomic inequalities, and human capital. In China, the total number of young adults moving from rural to urban areas reached 153 million in 2010, and accounted for about 30% of total rural labor[3].

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[3] Ministry of Human Resources and Social Security (2011) Human Resources and Social Security Undertakings

Furthermore, the accelerated rural depopulation driven by the vast and increasing out-migration of young labor has imposed huge obstacles to improving land use efficiency and coordinating urban–rural development in China, such as low efficiency in rural residential land use, and the lateral expansion of rural dwellings at the expense of farmland loss, decrease in the ability of rural development, and deterioration of rural residential environments (Liu and Liu, 2010; Li et al., 2014). Jiang et al. (2015) found that under China's Urbanization Plan 2014–2020, under which the uniquely Chinese household registration (*hukou*[4]) system will be gradually abolished, about 40% of rural migrant workers stated that they would choose to live in a city. If this were the case, a dramatic increase in energy consumption by rural migrants could be expected, especially if their social security and housing issues could be properly resolved through the *hukou* reforms. About 60% of the respondents in the study by Jiang et al. were young workers from rural areas, and more focused insights into those young workers could be derived from that study. Crivello (2015) examined young Peruvians' aspirations and the role of migration in their imagined futures and concluded that aspirations are about much more than abstract "futures;" aspirations determine young Peruvians' actions in the present and to a large extent can explain their current realities. Nugin (2014) argued that young people's out-migration from the rural areas in Estonia should be depicted as moving "forward" rather than "away;" however, this does not necessarily mean that they would never go back home, considering the constantly changing rural context in post-socialist Estonia. Nugin concluded that one of the additional options for rural areas to survive is to attract young people from other areas with the appeal of change and self-realization in a small community.

2. LIMITATIONS OF EXISTING THEORIES

As well-summarized by Hagen-Zanker (2008), previous studies have developed various methodologies to examine migration at the macro-, meso-, and microlevels, in which various factors are assumed to affect migration decisions. The factors assumed to exist in these theories may all work to explain migration decisions; however, we argue that migration decisions are, after all, a matter for an individual or a household. Especially in policymaking, it is necessary to understand not only the results of migration (e.g., where people actually moved), but also the process of migration decisions. For example, in Japan, the central government has sought to encourage more people to migrate into local cities from the three megacities (Tokyo, Nagoya, and Osaka) by adopting various policies. However, the resistance to migrating to local cities is remarkable. Therefore, it is important to understand how to encourage people's behavioral changes in migration.

In line with the above considerations, Hoppe and Fujishiro (2015) applied the theory of planned behavior to predict migration decisions by making use of potential migrants' expectations and attitudes toward migration and careers (i.e., the anticipated job benefits of migration, and career aspirations) as well as beliefs. The decision-making was conceptualized as having three phases: the predecisional, preactional, and actional phases. The predecisional phase corresponds with intentions, the preactional phase starts with exploring options for migrating by gathering information, and the actional phase involves definite actions for the move (e.g., making logistical arrangements). Such phases follow the basic idea of Prochaska et al. (1983, 1997). Hoppe and Fujishiro (2015) found that respondents are motivated to migrate, not only by the expectation of finding a job, but also by the opportunity to advance their careers. However, they could not find any interaction between the anticipated job benefits (of migration) and career aspirations. The study by Hoppe and Fujishiro (2015) concluded that it is necessary to combine the theory of planned behavior with the behavioral change stage model for a better understanding of migration. Using the National Longitudinal Study of Youth in the USA, Liu et al. (2010), based on a dynamic econometric model with self-selection, found that children's educational outcomes are affected by migration and maternal employment after controlling for the possible endogeneity of relevant decisions. In the context of international migration, Groenewold et al. (2012)

Statistical Bulletin of 2010 (in Chinese; http://w1.mohrss.gov.cn/gb/zwxx/2011-05/24/content_391125.htm).

[4] The traditional *hukou* system means that city residents' rights to public services depend on whether or not they have a *hukou*. As most rural migrants do not have a city *hukou*, they receive unequal access to urban public services, consequently discouraging them from permanently residing in cities.

revealed a significant influence of perceptions (threat to living conditions, benefits of and barriers to migration), cues to action, and self-efficacy on migration intentions. Interestingly, Kniveton et al. (2011) integrated the insights of the theory of planned behavior into an agent-based model to quantify the numbers of migrants generated by changes in climate. Such efforts of cleverly utilizing agent-based models created a new way to apply the theory of planned behavior in practice.

As for theories of behavioral changes, we point out that there are serious drawbacks, considering the fact that all existing studies, to the best of our knowledge, have focused on only a single form of behavior, such as environmental behavior, travel, or fertility behavior. If a change in a behavior is constrained by other behaviors, how can existing theories of behavioral changes be applied? For example, environmental attitudes and relevant social norms may not only influence the intention to change from commuting by car to using mass transit systems, but may also affect intentions to introduce energy-saving electronic appliances at home. If people enjoy the use of a car and various domestic electronic appliances as part of a comfortable modern lifestyle, then the habits of driving and using appliances cannot be treated separately. Because car use and other life choices may be interrelated, whether and how many old habits could be broken partially depends on how strongly the two behaviors are interrelated. In addition, the timing and duration of change also differ according to life choices. Applying similar sociopsychological approaches may not work well to unfreeze the two habits at the same time. A delay in reforming one form of behavior may lead to a failure to change another, and as a result, neither of the two types of behaviors may eventually change. The above arguments are probably equally applicable to intentions.

In summary, it seems that existing theories of behavioral change need to be modified to reflect the potential interdependencies between different life choices.

3.   BEHAVIORAL CHANGES ACROSS LIFE DOMAINS: A NEW WAY OF THINKING

Most of the above migration theories and models deal with migration decisions by referring to behavioral outcomes that supposedly reveal people's preferences; however, the internal processes underlying behavioral outcomes are ignored. For this purpose, methodologies that examine behavioral changes are useful, including behavioral change stage models (Prochaska et al., 1983, 1997), the theory of planned behavior (TPB) (Ajzen, 1988, 1991), and the theory of interpersonal behavior (TIB) (Triandis, 1977). Prochaska et al. argue that health behavior change involves progress through six stages of change: (1) precontemplation (no intention to take action within the next six months), (2) contemplation (the intention to take action within the next six months), (3) preparation (intention to take action within the next 30 days, and some behavioral steps have been taken in this direction), (4) action (changed overt behavior for less than six months), (5) maintenance (changed overt behavior for six months or more), and (6) termination (no temptation to relapse and 100% confidence). Both the theory of planned behavior and the theory of interpersonal behavior emphasize the importance of attitudes, social norms, and intentions, while the latter further argues that habits cannot be ignored. Studies based on the above theories/models have been conducted to investigate various forms of behavior, such as energy consumption (e.g., Nachreiner et al., 2015; Chen, 2016), environmental behavior (e.g., Botetzagias et al., 2015; De Leeuw et al., 2015), travel (e.g., Bamberg, 2013; Rowe et al., 2016), purchase of green products (e.g., Yazdanpanah and Forouzani, 2015; Paul et al., 2016), behavior concerning fertility (e.g., Mencarini et al., 2015), child rearing (e.g., Guo et al., 2016), and tourism (e.g., Han, 2015).

To capture behavioral changes in migration, influences of other life choices might not be ignored, as argued by the life-oriented approach (Zhang, 2014, 2015, 2016). In the following, we provide empirical evidence based on data collected in Japan in 2015.

4.   A SURVEY IN JAPAN

We conducted an Internet questionnaire survey with the working population of the Tokyo Capital Area, including the Tokyo Metropolitan Area, Kanagawa, Chiba, Saitama, Ibaragi, Tochigi, Gunma, and

Yamanashi Prefectures in December 2015. The survey includes items about migration, employment, child rearing, and dwellings, focusing especially on young people. Specific items mainly concern (1) migration history and reasons for previous migration as well as the influences of other people; (2) type of current job, location of workplace, duration of tenure, and mode of commuting; (3) current residential location, current and ideal residential environment (in terms of distance to daily facilities), and car ownership; (4) household structure (including the presence of children, members' residential location, and their coresidence with a parent); (5) items based on the theory of planned behavior (mainly attitudes, social norms, and intentions) with respect to migration, jobs, child rearing, and dwellings; (6) intended migration destinations in future and the conditions for future migration; and (7) information about discretional activities in daily life. The purpose of the above survey is to clarify the extent to which the working population of the Tokyo Capital Area would like to migrate to local cities and to encourage more people to work/live there. We conducted the survey with the assistance of a major Internet survey company in Japan, and collected valid data from 1,000 workers aged 20–40 (Table 1), which is a representative sample of the working population in the Tokyo Capital Area.

Table 1. Distributions of age and gender of the working respondents by prefecture

Attribute \ Prefecture	Tokyo (23 wards)	Kanagawa prefecture	Chiba prefecture	Saitama prefecture	Ibaragi prefecture	Tochigi prefecture	Gunma prefecture	Yamanashi prefecture	Subtotal
Male: 20s	1.6%	3.6%	2.4%	2.8%	1.4%	1.0%	1.0%	0.4%	14.2%
Male: 30s	2.4%	5.8%	3.4%	4.4%	2.2%	1.6%	1.6%	0.6%	22.0%
Male: 40s	2.4%	5.6%	3.2%	4.0%	2.0%	1.4%	1.4%	0.6%	20.6%
Female: 20s	1.4%	3.0%	2.0%	2.2%	1.0%	1.0%	0.8%	0.4%	11.8%
Female: 30s	1.8%	3.8%	2.6%	3.0%	1.4%	1.0%	1.0%	0.4%	15.0%
Female: 40s	1.8%	4.2%	2.8%	3.4%	1.6%	1.0%	1.2%	0.4%	16.4%
Subtotal	11.4%	26.0%	16.4%	19.8%	9.6%	7.0%	7.0%	2.8%	100.0%

As for types of jobs (Figure 1), more than 60% of the working respondents are businesspeople, and about 30% of the female respondents are part-time workers, a proportion that is more than four times higher than that of male respondents. There are more single people and married couples without children in the 23 wards of Tokyo than respondents in other life stages, compared with other areas (Table 2). As Figure 2 shows, the parents of 66.4% of the respondents were living in the Kanto region (which has a large overlap with the Tokyo Capital Area).
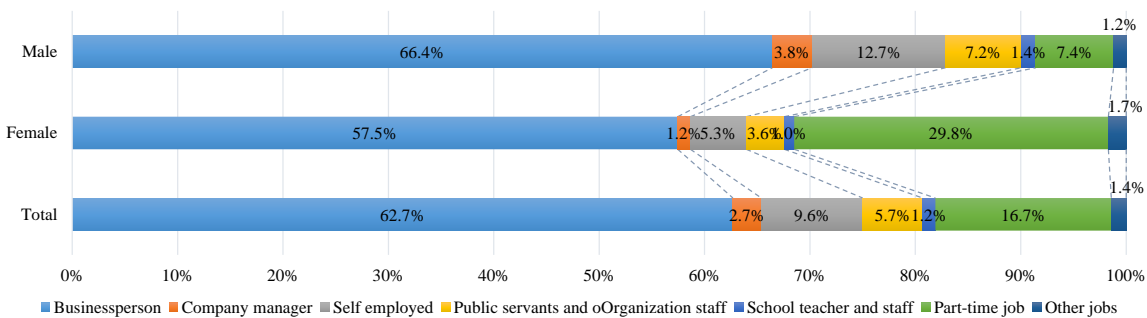

Figure 1. Distribution of jobs by type

Table 2. Life stages by workplace

Workplace \ Life stages	Single	Married without child	Married with one child	Married with two or more children	Single parent	Total
Tokyo: 23 wards	54.4%	16.3%	12.8%	14.9%	1.7%	100.0%
Other areas of Tokyo	49.4%	14.2%	13.7%	19.4%	3.3%	100.0%

| 7.5% | 66.4% | 8.4% | 5.4% | 2.7% | 3.6% | 6.0% |

■ Hokkaido & Tohoku regions　■ Kanto region　■ Chubu region　■ Kinki region
■ Chugoku & Shikoku regions　■ Kyusyu & Okinawa regions　■ Overseas or passed away
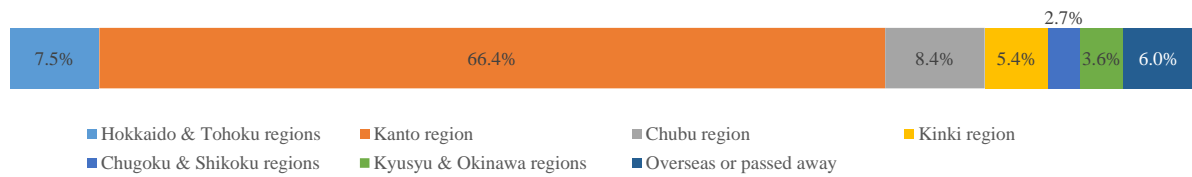
Figure 2. Distribution of the residential location of respondents' parents

In the survey, respondents reported their migration histories (the maximum was five times) and reasons for each migration (see Figure 3: note that each respondent can provide one or more reasons). The average number of migrations reported is 2.4. The most common reason was for employment (32.9%) (job change: 13.1%; (voluntarily: 9.8%); to find a job: 13.0%; job relocation: 6.2%; inheritance of family business: 0.6%). This finding is consistent with traditional migration theories, which emphasize the role of economic factors (e.g., Massey et al., 1993; Groenewold et al., 2012), and other previous studies (e.g., Fahr and Sunde, 2006; Kennan and Walker, 2010; Huinink et al., 2014). It is also consistent with the observations by the Central Government of Japan[5]. In our previous study using a life history survey conducted with residents in various Japanese cities in 2010 (Zhang et al., 2014), the peak ages for both job mobility and residential relocation were observed to be between 25 and 30 years old. This also supports the above findings. Interestingly, more than 20% of respondents reported that their migration was to accompany their parents (the respondent's parent: 12.1%; the parent of the respondent's spouse: 6.8%). There are some studies in the literature on the effects of parental migration on their children's lives (e.g., Clifton-Sprigg, 2015; Graham et al., 2015); however, no study has clarified how parents affect their children's migration. In this sense, this finding is new. As shown in Figure 2, 66.4% of respondents live close to their parents (within the same region: Kanto). This suggests that the distance to a parent's residence is also critical in migration decisions. This may be a particular characteristic of Japan and some Asian countries with a strong tradition of caring for parents. It is worth conducting an international comparison to clarify this point. Other strong reasons for migration are going to school (12.0%) and getting married (10.1%), which is consistent with our intuitions. Furthermore, environmental factors cannot be ignored: there are housing issues (9.4%), the living environment (6.7%), and the convenience of commuting and schooling of the respondent (5.2%).

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[5] http://www.mlit.go.jp/hakusyo/mlit/h26/hakusho/h27/html/n1211000.html (accessed January 30, 2016).
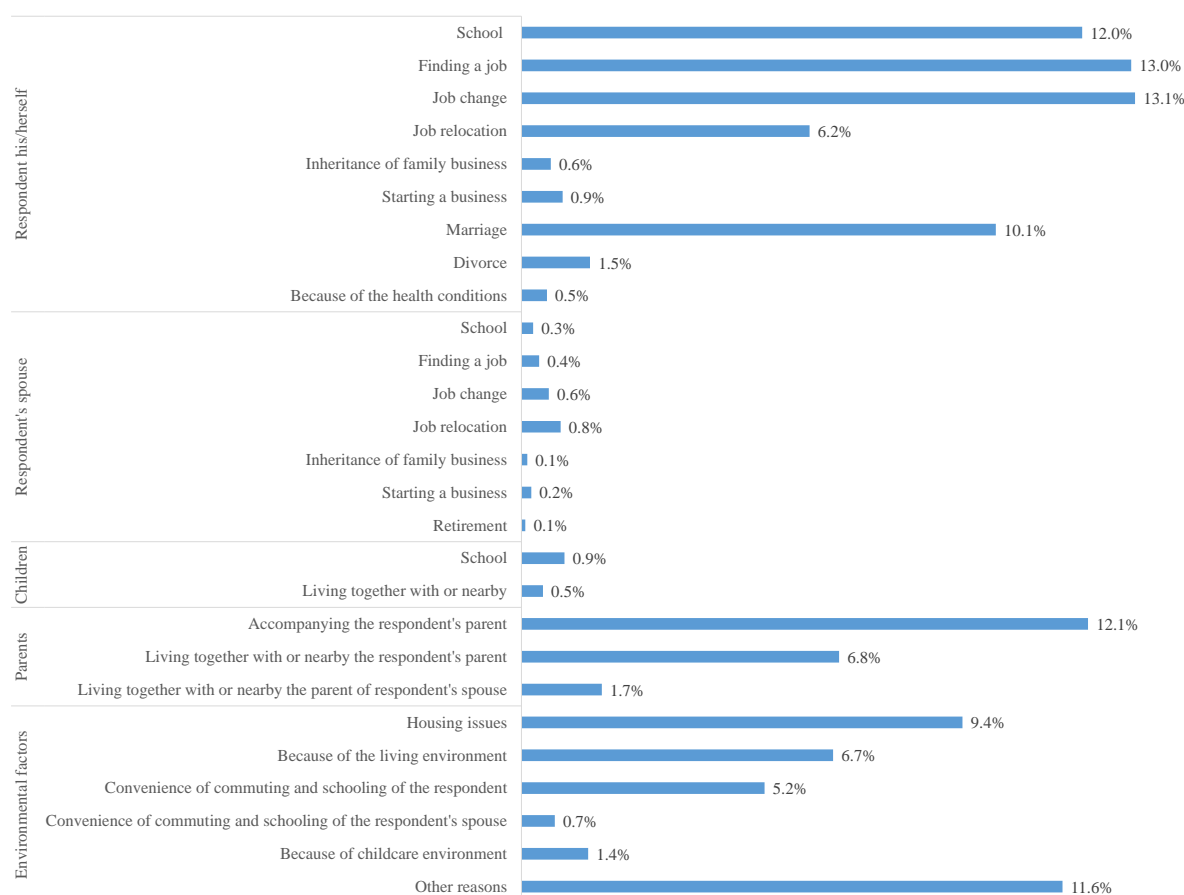
Figure 3. Reasons of migration in the past

5. EVIDENCE OF INTERRELATED BEHAVIORAL CHANGES ACROSS LIFE DOMAINS

As shown in Table 3, among all the respondents, 42.1% are willing to reside in the current city, 21.3% have not even considered their future residence, 5.0% of respondents have already decided to migrate, but not voluntarily, and 2.8% of responses are related to overseas migration. In other words, 71.2% of these respondents may have ruled out voluntary relocation to other places in Japan. The strongest resistance to migration is expressed by those in their 30s: 47.6% reported that they were willing to live in the current city of residence. This willingness to remain shows the largest variation across the three age groups (32.8%–47.6%). In contrast, variations across age groups with respect to other behavioral changes are unremarkable. In relation to migration to other places in Japan, 17.2% of respondents have considered their future residence—however, they hesitated to decide; 8.7% intended to move to other places in Japan; 1.3% had already begun preparation for future voluntary migration, and just 1.6% had already decided to move to other places in Japan. The above 28.8% of respondents (i.e., 288 people) were asked to report their potential migration places, with the assumption that they had already decided to migrate. As a result, 166 people reported that they would migrate to one of the three megacity regions (Tokyo, Nagoya, or Osaka), i.e., 16.6% in total. A total of 122 people (30 people aged in their 20s (3.0% of the total), 44 people aged in their 30s (4.4%), and 48 people aged in their 40s (4.8%)) reported that they would migrate to local cities (103 people: 10.3%) and rural areas (19 people: 1.9%), i.e., 12.2% in total. These results are consistent with our intuition; that is to say, most people do not want to move from the Tokyo Capital Area once they have settled there. This suggests a difficulty in resolving the fundamental issues caused by the overconcentration of the Japanese population. Since 2014 in particular, the Japanese government has actively implemented various policies to encourage more people to move to places beyond the three megacity regions, to revitalize local cities and rural areas. However, it

remains questionable how large the influence of these percentages—3.0% in their 20s, 4.4% in their 30s, 4.8% in their 40s, and 12.2% overall—is on the revitalization of local cities and rural areas. A comparison of the three age groups reveals that those in their 20s have the lowest percentage of people who are willing to live in the current city of residence, while this is highest for those in their 30s. The proportions of those intending to move to other places in Japan are similar among the three age groups. The proportion of those in their 20s and 30s that hesitate to move is higher (by 4.8 percentage points) than those in their 40s. The proportion of those in their 20s who have already decided to move to other places in Japan is highest (3.1%); however, the proportions moving to other places in Japan are similar in the three age groups.

Table 3. Shares of behavioral change stages with respect to migration from Tokyo, Japan

Age groups		20s	30s	40s	Total
Sample size (persons)		259	380	361	1,000
Behavioral change stages					
(1)	Migration was already decided, but not because of respondents' own will.	7.7%	4.2%	3.9%	5.0%
(2)	Be willing to live in the current residence city.	32.8%	47.6%	42.9%	42.1%
(3)	Have not even considered future residence.	23.6%	17.4%	23.8%	21.3%
(4)	Have considered future residence, but have hesitated to decide.	18.9%	18.9%	14.1%	17.2%
(5)	Intend to move to other places in Japan	9.3%	7.9%	9.1%	8.7%
(6)	Already started the preparation for future migration based on respondent's own will.	1.5%	0.8%	1.7%	1.3%
(7)	Already decided to move to other places in Japan	3.1%	1.1%	1.1%	1.6%
(8)	Are considering moving to overseas, or preparing for overseas migration, or already decided moving to overseas.	3.1%	2.1%	3.3%	2.8%
	Total	100.0%	100.0%	100.0%	100.0%

Next, the concurrence of behavioral changes in terms of migration and of job, child rearing, and residence are shown in Tables 4–6. We conducted a χ^2 test to examine whether the behavioral changes between each of the above three pairs of life domains are independent, and rejected the hypotheses of independence in all cases on statistical grounds (as shown at the bottom of each table). Given this

Table 4. Joint occurrence of behavioral changes between migration and job

Job / Migration	Future job was decided, not because of own will	Willing to continue current job	Hesitating whether to continue the current job	Intend to have a change in job	Started to prepare for job change based on own will	Decided to have a change in job based on own will
	(2.5%)	(49.5%)	(25.2%)	(16.3%)	(3.9%)	(2.6%)
(1) Migration was decided not because of respondents' own will.	24.0%	42.0%	22.0%	8.0%	0.0%	4.0%
(2) Be willing to live in the current residence city.	1.4%	63.2%	18.8%	13.1%	1.9%	1.7%
(3) Have not even considered future residence.	1.9%	47.4%	33.8%	13.6%	1.9%	1.4%
(4) Have considered future residence, but have hesitated.	1.2%	36.6%	33.7%	22.1%	5.2%	1.2%
(5) Intend to move to other places in Japan	0.0%	29.9%	24.1%	35.6%	9.2%	1.1%
(6) Already started the preparation for future based on own will.	0.0%	38.5%	15.4%	7.7%	30.8%	7.7%
(7) Already decided to move to other places.	6.3%	18.8%	25.0%	25.0%	12.5%	12.5%
(8) Are considering moving to overseas, or preparing for, or already decided.	0.0%	35.7%	17.9%	3.6%	14.3%	28.6%

Independence test for all categories: CHISQ = 321.9 (DF=35, p=0.000); Independence test for categories excluding items (1) and (8) of migration: CHISQ = 132.1 (DF=20, p=0.000)

Table 5. Joint occurrence of behavioral changes between migration and residence

Dwelling / Migration	Satisfied with current residence and no need to change	Have not considered: to change or not in future	Hesitating: to change in future or not	Intend to change in future	Already started to prepare for changing	Already decided to change
	(28.1%)	(18.2%)	(9.2%)	(36.4%)	(4.4%)	(3.7%)
(1) Migration was decided not because of respondents' own will.	24.0%	14.0%	14.0%	28.0%	4.0%	16.0%
(2) Be willing to live in the current residence city.	47.7%	15.4%	6.4%	26.1%	2.4%	1.9%
(3) Have not even considered future residence.	18.3%	35.7%	8.0%	34.7%	1.4%	1.9%
(4) Have considered future residence, but have hesitated.	9.3%	13.4%	19.8%	48.3%	7.6%	1.7%
(5) Intend to move to other places in Japan	8.0%	9.2%	3.4%	70.1%	5.7%	3.4%
(6) Already started the preparation for future based on own will.	0.0%	0.0%	0.0%	30.8%	61.5%	7.7%
(7) Already decided to move to other places.	6.3%	6.3%	12.5%	31.3%	6.3%	37.5%
(8) Are considering moving to overseas, or preparing for, or already decided.	17.9%	7.1%	7.1%	46.4%	7.1%	14.3%

Independence test for all categories: CHISQ = 431.2 (DF=35, p=0.000); Independence test for categories excluding items (1) and (8) of migration: CHISQ = 411.0 (DF=25, p=0.000)

Table 6. Joint occurrence of behavioral changes between migration and child rearing

Migration \ Child rearing	Never marry or have a child	No. of current children is ideal and no more children	Not considered: marry or (more) children	Hesitating: marry or have (more) children	Intend to have (more) children	Started to prepare for having children	Decided to have children
	(16.7%)	(21.7%)	(18.1%)	(9.0%)	(26.8%)	(4.5%)	(3.2%)
(1) Migration was decided not because of respondents' own will.	10.0%	28.0%	14.0%	8.0%	26.0%	8.0%	6.0%
(2) Be willing to live in the current residence city.	17.1%	28.7%	16.2%	7.6%	23.0%	4.5%	2.9%
(3) Have not even considered future residence.	18.3%	16.4%	28.2%	10.3%	24.4%	0.9%	1.4%
(4) Have considered future residence, but have hesitated.	14.5%	16.3%	15.1%	9.3%	34.9%	7.6%	2.3%
(5) Intend to move to other places in Japan	20.7%	12.6%	16.1%	10.3%	33.3%	4.6%	2.3%
(6) Already started the preparation for future based on own will.	7.7%	23.1%	15.4%	7.7%	38.5%	0.0%	7.7%
(7) Already decided to move to other places.	18.8%	0.0%	6.3%	6.3%	43.8%	18.8%	6.3%
(8) Are considering moving to overseas, or preparing for, or already decided.	14.3%	17.9%	10.7%	17.9%	17.9%	0.0%	21.4%

Independence test for all categories: CHISQ = 113.0 (DF=42, p=0.000); Independence test for categories excluding items (1) and (8) of migration: CHISQ = 71.8, (DF=30, p=0.000)

interdependence across life domains, even though some young people may intend to migrate to local cities, they may not do so, because behavioral changes in other domains do not support such a change.

Among those who intend to move to other places in Japan (8.7%), those who either intend to change jobs (35.6%), those preparing for a voluntary job change (9.2%), or those who have already decided on a voluntary job change in future (1.1%) only account for about 46%. For the remainder, 24.1% hesitate to decide whether to continue their current job or change it, and 29.9% are willing to continue their current job. As for changes of dwelling, those who intend to change to another residence in future (70.1%), who are already preparing to move (5.7%), or who have decided to change residence in the near future (3.4%) account for about 80%. Concerning change in the child rearing domain, those who either intend to have children or to have more children in future (33.3%), who are currently planning to have children (4.6%), or who have decided to do so in the near future (2.3%) only account for about 40%. Thus, the intention to migrate in future is much more consistent with potential changes in residence than with changes in jobs or child rearing.

Keeping the above interdependencies across life domains in mind, we estimated a structural equation model, focusing only on intentions in different life domains, to test whether intention to migrate is affected by intentions to change job, dwelling, or child rearing. The model estimation reflects correlations among the latter three items. Figure 4 illustrates the estimation results. The goodness of fit (GFI) value is 0.954, suggesting that the model fit is sufficient to support the above hypothesis. Obviously, intentions with respect to jobs, dwellings, and child rearing all have a statistically significant effect on intention to migrate. Significant correlations of intentions are also confirmed with respect to jobs, dwellings, and child rearing. The intention to change dwelling has the strongest influence on the intention to migrate, where its effect size (i.e., the direct effect: 0.392) is more than twice as high as that of employment (0.150) and seven times higher than that of child rearing (0.056). Concerning intentions to change jobs, dwellings, or child rearing, the correlation between jobs and dwellings is highest (0.321) and the lowest correlation is observed between jobs and child rearing. To the best of our knowledge, this is the first study to reveal such interrelated behavioral changes in multiple life domains. The above findings suggest that it is necessary to reformulate traditional theories of behavioral changes by properly reflecting interdependency across life domains. It is also expected that such reformulation of theories of behavior could provide further sound insights into cross-sectoral policies to support migration.
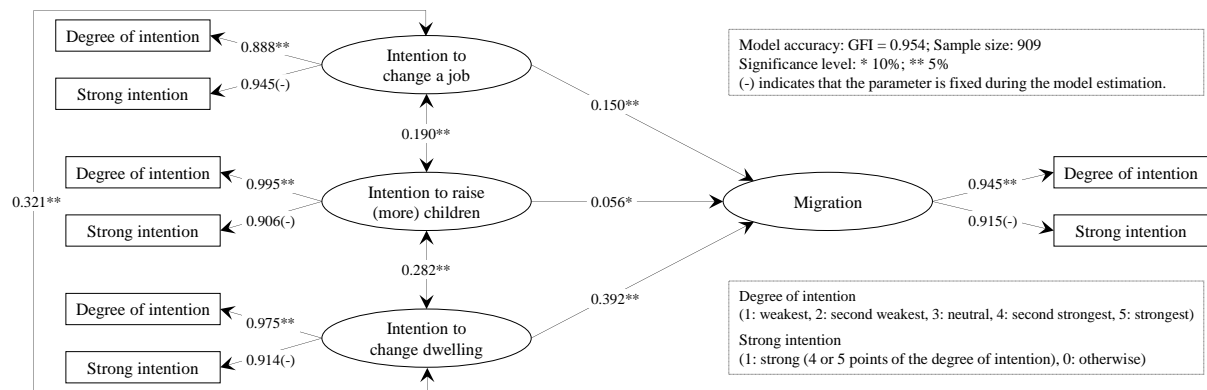

Figure 4. Correlations of intentions across life domains: Migration, job, dwelling, and child rearing

6. Conclusions

Urban policies are intended not only to regulate people's behavior using various laws, institutional rules, and economic measures (but consensus building is required), but also to encourage voluntary changes in people's behavior in desirable directions through efficient communication. In particular, voluntary behavioral changes are essential for sustainable urban development, which requires close collaboration between various stakeholders over a considerable period. In the context of migration, such collaboration largely determines the population size and structure of a city/region, which is the most important input

for almost all urban policies. On the other hand, no city/region could survive without connections to other parts of a nation or the world. Migration also determines and reflects the development patterns of a nation, which in turn affect the development of cities/regions. Thus, understanding migration behavior is essential for being able to make decisions on urban policies.

The population size of a city/region is important for its development, but the quality of its population is much more important (Romer, 1990). Florida (2002a, b) and Zachary (2000) argued that regional innovation and economic growth are strongly associated with the creativity and diversity of a region, and it is especially important to attract talented individuals or those with high levels of human capital, because the presence of such human capital in turn attracts and generates innovative, technology-based industries. In fact, the importance of such high-quality human capital in urban and region development has been long recognized (Ullman, 1958; Jacobs, 1961). More empirical evidence is provided by Mathur (1999). To attract such human capital successfully, there is no doubt that economic incentives (salaries or relative deprivation elsewhere) are important; however, the roles of factors such as amenities, recreation, and lifestyles are crucial (Gottlieb, 1995; Kotkin, 2000; Glaeser et al., 2001; Lloyd and Clark, 2001; Florida, 2002a, b). According to Yigitcanlar et al. (2007), knowledge workers prefer to live in a city that not only has affordable housing, but also high-quality urban services/facilities (e.g., child rearing, school education, and health care), a rich retail environment, and an attractive entertainment environment (professional sports, music, arts, and historical sites), and also offers a rich life in retirement. Frenkel et al. (2013), emphasizing that knowledge workers play three roles: household members, workers, and leisure consumers, further revealed that land uses related to culture, education, and lifestyle influence knowledge workers' residential behavior, in addition to the socioeconomic level of the city, the affordability of its housing, commuting time, and travel time to the city center. Households with culture-oriented lifestyles prefer to live in a city center, and households with home-oriented lifestyles prefer a suburban residence.

Based on an extensive literature review about various macro-, meso-, and microlevel studies, Hagen-Zanker (2008) concluded that migration decisions should be considered at a household level, where social networks, migration institutions (e.g., rules and norms governing the network that reduce transaction and migration costs), and relative deprivation (relative income, levels of inequality in a community) are emphasized. This argument is in line with our viewpoint about the intrahousehold and social interactions seen in studies of residential behavior (e.g., Zhang and Fujiwara, 2009), car ownership (Zhang et al., 2009; Kuwano et al., 2011), time use (Zhang et al., 2002; Zhang and Fujiwara, 2006), energy consumption (Yu et al., 2012), and tourist behavior (Wu et al., 2013). Additionally, we would like to argue for the importance of analysis of other life choices in migration studies. Human behavior, including migration behavior, changes over time.

There exist various dynamic behavior models in the literature; however, most previous studies have strongly focused on behavioral outcomes, rather than the process underlying them. This is true for not only migration behavior, but also for other life choices. With the above arguments in mind, it seems necessary to address both behavioral changes related to the decision-making process and temporal dynamics related to behavioral outcomes (i.e., decision results) simultaneously by incorporating various interdependencies. In relation to behavioral changes, intentions are not only affected by attributes and norms, but also by experience and expectation. The influence of experience is called "state dependence" (Heckman, 1981). Previous studies have widely represented state dependence by directly linking behavioral outcomes (choice results) over time (e.g., Kitamura, 1990; Hunt, 2008; De Jong et al., 2012; Carro and Traferri, 2014; Zhang et al., 2014; Plum and Ayllon, 2015), and have also shown that many human decisions are forward-looking (e.g., Manski, 1999; Chan and Stevens, 2004; Khan and Dhar, 2007; Van der Klaauw and Wolpin, 2008; Van der Klaauw, 2012; Zhang et al., 2014; Tran et al., 2015). However, considering the importance of behavioral changes related to the decision-making process, it seems more logical to represent state dependence and future expectations via intentions. The correlations revealed in Figure 4 should also be reflected. There are various challenges (such as surveys, modeling, and policy applications) to realizing this comprehensive but complicated framework. In surveys, it is not an easy task to collect data, especially about items of behavioral change over time using methods such as panel surveys, considering the burden these place on respondents. Innovative survey methods (including retrospective surveys) should be developed. As for modeling, both utility-based approaches with attractive features for economic evaluations of policies (e.g., Yu et al., 2012), but also

agent-based approaches with flexibility in managing various complex aspects (e.g., Kniveton et al., 2011) should be further improved to deal with large sets of life choices.

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