CSRDA Discussion Paper

Downward Mobility and Loneliness: Consequences of Intergenerational Educational Mobility in Japan

No.	Date	SDGs
83	**April. 2024**	3 GOOD HEALTH AND WELL-BEING 10 REDUCED INEQUALITIES

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Downward Mobility and Loneliness: Consequences of Intergenerational Educational Mobility in Japan

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Ethical statement

The study was reviewed and approved by the Research Ethics Committee of the Osaka International Cancer Institute (no. 1611079163-2) and the National Institute of Public Health (NIPH-IBRA#12112). All procedures were conducted in accordance with the ethical standards of the Helsinki Declaration of 1975, as revised in 2013. The study protocol was reviewed and approved by the Research Ethics Committee of the Osaka International Cancer Institute (approved on June 19, 2020; approval number 20084). The internet survey agency respected the Act on the Protection of Personal Information in Japan. All participants provided web-based informed consent before responding to the online questionnaire. A credit point known as "Epoints", which could be used for internet shopping and cash conversion, was provided to the participants as an incentive.

The data used in this study are not available in a public repository because they contain personally identifiable or potentially sensitive patient information. Based on the regulations for ethical guidelines in Japan, the Research Ethics Committee of the Osaka International Cancer Institute has imposed restrictions on the dissemination of the data collected in this study. All data enquiries should be addressed to the person responsible for data management, Dr. Takahiro Tabuchi at the following e-mail address: tabuchitak@gmail.com.

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Abstract

Studies have examined the impact of intergenerational mobility on socioeconomic, psychological, or health outcomes. However, despite its increasing importance in recent years, little is known about its impact on feelings of loneliness. Using survey data collected in Japan in 2022, we analyzed the relationship between the experience of intergenerational educational mobility and current levels of loneliness among young and middle-aged individuals. Using diagonal reference models, which allowed us to isolate the effect of mobility from the influences of origin and destination, we found that downward intergenerational educational mobility was significantly associated with greater loneliness, whereas upward mobility was not. Moreover, the effect of downward educational mobility was stronger among men than women. These results suggest that intergenerational mobility also affects loneliness. We discuss the theoretical implications of these findings and conclude that loneliness should be studied not only in terms of individuals' current situations but also in terms of their experiences and social contexts.

Keywords

Intergenerational mobility, loneliness, education, diagonal reference model, Japan

Introduction

Intergenerational mobility affects a wide range of socioeconomic, health, and psychological outcomes. While intergenerational mobility has been studied as an indicator of social fluidity or equality of opportunity (Torche, 2015), it is also associated with social, economic, and cultural changes in individuals that may affect their attitudes, health, and behavior (Blau, 1956; Sorokin, 1959). A number of studies have shown the significant association of intergenerational mobility with various outcomes such as subjective well-being or happiness (Dhoore et al., 2019; Kwon, 2022; Marshall & Firth, 1999; Zang & de Graaf, 2016), physical health (Jonsson et al., 2017; Präg & Richards, 2019; van der Waal et al., 2017), mental health (Gugushvili, Zhao, et al., 2019; Houle & Martin, 2011), and health behaviors (Dennison, 2018; Gugushvili, McKee, et al., 2019).

Based on the literature on the consequences of intergenerational mobility, we extend this to loneliness, which has received increasing attention. Loneliness represents the subjective feeling of being alone or a lack of social participation and is characterized as a distressing feeling that accompanies the sense that one's social needs are not satisfied by their relationship quality or quantity (Hawkley & Cacioppo, 2010). This is distinguished from the objective aspect of social contact or embeddedness, or social isolation (Peplau & Perlman, 1982). Loneliness is an important predictor of health outcomes such as mortality risk (Holt-Lunstad et al., 2010; Wang et al., 2023). This has been frequently studied in older people, but it can be experienced by individuals of all ages (Franssen et al., 2020). Loneliness has become a pressing social issue in many countries, particularly since the onset of the COVID-19 pandemic. For example, in Japan, a Minister of Loneliness was established in 2021 and reported that approximately 40% of people feel lonely (Office of Loneliness and Isolation, Cabinet Secretariat, 2022). Despite the

worldwide rise in loneliness, little is known about its determinants from an intergenerational perspective.

This study examined the relationship between intergenerational educational mobility and loneliness using large-scale survey data collected in Japan in February 2022. We measured intergenerational mobility as the difference in educational attainment between parents and respondents because educational attainment is a strong class/status marker in Japan. As in other industrialized countries, educational attainment is closely linked to subsequent occupational and income attainment (Ishida, 1993). In addition, higher educational attainment is considered a socially valuable good, and many people compete for it through significant parental investment in their children (Dawson, 2010; Hannum et al., 2019). In these environments, people who have experienced downward mobility may feel a sense of "defeat," which will increase their loneliness, even if their level of educational attainment is the same as that of others. By contrast, upward mobility may compensate for instability due to intergenerational mobility, resulting in lower levels of loneliness. We also investigate the differences in the effect of intergenerational mobility by gender because men and women face different competitions for educational attainment, especially in Japanese gender essentialism, which emphasizes men's economic success and fulfillment of the breadwinner role over that of women (Brinton & Lee, 2016). In this context, we focused on young and middle-aged individuals who experienced a period of educational expansion to examine the effects of educational mobility on loneliness and gender differences.

We use a diagonal reference model to measure the effects of intergenerational mobility (Sobel, 1981, 1985). This model allows us to isolate the association of intergenerational mobility with outcomes from the independent effects of origin and destination, which has been established

as the standard method for studying mobility effects (Zang et al., 2022). Drawing on hypotheses from traditional theories of social mobility (Blau, 1956; Newman, 1999; Sorokin, 1959) and theories emphasizing the downside of downward mobility (Newman, 1999), we examined the consequences of intergenerational educational mobility on loneliness.

Theoretical background

Studies on the individual consequence of intergenerational mobility have shown that intergenerational mobility is associated with a broad sense of aspects such as subjective well-being (Hadjar & Samuel, 2015; Nikolaev & Burns, 2014; Zhao et al., 2017), subjective health (Monden & de Graaf, 2013; Steiber, 2019; Tarrence, 2022), mental health (Gugushvili, Zhao, et al., 2019; Houle & Martin, 2011), health behavior (Dennison, 2018; Gugushvili, McKee, et al., 2019), mortality, obesity, physiological stress, functional somatic symptoms (Billingsley et al., 2018; Präg & Richards, 2019; van der Waal et al., 2017), depression (Miller et al., 2020; Ward et al., 2016, 2018). These studies have focused on the effects of social mobility and how these effects vary according to the direction of mobility. They also tested theories explaining the effects of social mobility. These theories were derived from traditional social mobility studies (Blau, 1956; Sorokin, 1959) and relatively new studies (Gugushvili, Zhao, et al., 2019; Newman, 1999). These theories make different assumptions regarding the consequences of social mobility on the psychological outcomes of mobile members.

Sorokin (1959) assumed that *all mobility, regardless of direction, negatively affects mobile members.* He viewed non-mobile members as inflexible in their behavior. By contrast, mobile members are "marked by the stigmas" of their positions. Social position is seen as a social environment that determines various aspects such as ideas, beliefs, values, and opinions.

Social mobility is accompanied by changes in the original social environment (Sorokin, 1959, p. 509). Mobile members have to adopt all new attitudes that cause nervous system activity, permanent mental strain, mental diseases, and even social isolation and loneliness (Sorokin, 1959, pp. 509-523). This assumption is often called the "dissociative" hypothesis, which postulates the negative effects of mobility regardless of direction.

Blau (1956) also argued that *the behaviors or attitudes of upwardly and downwardly mobile members are intermediate between those of origin and destination members*. This assumption is also referred to as the "acculturation" hypothesis. This hypothesis shares similar assumptions regarding the negative influence of mobility effects, and postulates different mobility effects. Mobility involves re-establishing interpersonal relationships and community integration, creating dilemmas for mobile members. They are considered the "marginal men" who are not fully integrated into their origin and destination classes. Sorokin assumed that mobility per se would have a negative impact on mobile members, and Blau assumed that their behaviors and values would be located between the origin and destination classes as they are in the process of adapting to the new environment.

Newman (1999) postulates that *downward mobility has a detrimental impact on the well-being of mobile members*. Downward mobility is not the only change in economic status from affluent to less affluent or to poverty. Still, it is accompanied by strong feelings such as anger, dismay, and injustice (Newman, 1999, p.8). Although upwardly mobile members have problems with the new destination, they also have economic and emotional rewards, such as status fulfillment, economic security, community, and family life, which can compensate for the adverse effects of mobility. Conversely, downwardly mobile members must adapt to the new class and endure an environment inferior to their previous affluence with a decline in income,

loss of status, and disruption of social ties. They must confront feelings of failure and social betrayal. The "falling from grace" hypothesis (Newman, 1999) predicts much more negative effects on the well-being of downwardly mobile members than upward mobile members.

Finally, Gushivili and colleagues highlight *the positive influences of upward mobility on psychological well-being*, referred to as the "rising from rags" hypothesis (Gugushvili, Zhao, et al., 2019). Achieving better positions than their parents cultivates confidence in overcoming the difficulties associated with their background, a new affluent environment, and a sense of gratitude for their new status, which enhances their psychological well-being. Rather than the negative impact of downward mobility, this hypothesis emphasizes that the positive effects of upward mobility outweigh its adverse effects.

The Japanese context and hypotheses

Loneliness has attracted considerable attention since the COVID-19 outbreak in Japan. The government urged people not to go out to prevent infections during the COVID-19 pandemic in 2020 and 2021, drawing much attention to the loss of social connections and increased loneliness among individuals. The Office of Loneliness and Isolation, which was established in 2021, conducted a national survey and reported that approximately 40% of the total population in total "always," "sometimes," or "occasionally" feel lonely in 2021 (Office of Loneliness and Isolation, Cabinet Secretariat 2022). Others also report that loneliness is associated with individuals' demographic characteristics, economic status, or perceptions, using survey data collected during the COVID-19 pandemic (Badman et al., 2022; Stickley & Ueda, 2022). Research has shown that men are less likely to experience loneliness than women; younger people are less likely to experience loneliness than older people; those who live alone are less

likely to experience loneliness than people who live with someone; those who are employed are less likely to experience loneliness than people who are unemployed; and people with higher incomes are less likely to experience loneliness than lower-income persons (Badman et al., 2022; Office of Loneliness and Isolation, Cabinet Secretariat, 2022; Stickley & Ueda, 2022). However, limited research has been conducted on the correlates of loneliness in Japan.

Individuals' past experiences, especially intergenerational educational mobility, may significantly affect their loneliness. Educational attainment is an important determinant of subsequent labor market success, as in other countries (Ishida, 1993). The competition for admission to higher education institutions is depicted as *examination hell* (Ono, 2007). Examination-based systems have roots in Confucianism, which places high value on working hard and passing exams (Thomas, 1983). Parents spend a lot of money on remedial education, such as cram schools or private tutors, for their children's educational success (Hannum et al., 2019; Park et al., 2016) and also provide intensive parenting regardless of their class background (Raymo et al., 2023). These studies suggest that parents want their children to attain higher educational attainment. Students are similarly motivated to avoid downward social mobility regardless of their objective class background (Fujihara, 2023), which is consistent with the relative risk aversion hypothesis (Breen & Goldthorpe, 1997). These institutional features impose an important connotation of educational mobility on individuals' social and psychological loneliness.

Another important institutional background has been educational expansion over recent decades. The Japanese education system is characterized as a comprehensive education system with weak vocational training (Shavit & Müller, 1998), with 9 years of compulsory education, 3 years of high school education, and the subsequent 2 years of junior college or 4 years of

university.[1] Enrollment rates in high school and tertiary education in Japan have been increasing with a brief period of stagnation, as shown in Figure 1. The high school enrollment rate reached 90% for those born in 1958. Enrollment rates in higher education have also increased for both men and women. After a period of restrained growth in college enrollment for approximately 15 years (Amano, 1997), the university enrollment rate for both men and women increased again to over 50% for those born in 2000. Moreover, men and women have different educational attainments on average within higher education; because junior colleges were established and expanded primarily to educate women, most men went to college instead of junior college, while the rate of women going to junior college remained higher than that of men going to college for a long time (Brinton, 1993).

Educational expansion and the competitive environment for higher educational attainment in Japan will increase people's expectations of avoiding downward educational mobility, resulting in a greater negative effect of downward mobility and a protective effect of upward mobility on feelings of loneliness. In particular, when people expect upward mobility, downward mobility has negative connotations of loneliness by losing social ties with others (Newman, 1999). Besides, downwardly mobile members might have negative feelings because they have not succeeded in attaining higher levels of education than their parents, even though they are expected to attain higher levels of education. In this regard, Newman (1999) pointed out that downwardly mobile members could blame themselves where the culture of meritocracy is mainstream because, in that society, the results are considered to be one's efforts, which will also

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[1] Other characteristics of Japan's education system are the extremely small variation in the age of students who go on to higher education and the extremely low dropout rate. Almost all students entering high school are 15 years old, and most students entering college are between the ages of 18 and 19. That it, there is almost no interval between the completion of the previous educational institutions and the enrollment to subsequent educational institution. The university dropout rate is less than 10%, which is the lowest among OECD countries (OECD, 2019).

be true for Japan. Thus, we expected downward mobility to be significantly associated with greater loneliness than immobility (**Hypothesis 1a**). On the other hand, upward mobility will compensate for the adverse effect because those who have achieved upward mobility will generate a sense of gratitude by winning the competition for educational attainment, as the "rising from rags" hypothesis suggests (Gugushvili, Zhao, et al., 2019). Thus, we expected upward mobility to be associated with lower levels of loneliness than was immobility (**Hypothesis 1b**).

Moreover, the impact of intergenerational mobility is stronger for men than women. Gender essentialist norms prevail in Japan (Brinton & Lee, 2016), whereby men are expected to play the role of breadwinners after marriage, while women are expected to take care of their families. Men are more strongly motivated by their parents to achieve higher levels of education (Brinton, 1993; National Institute of Population and Social Security Research, 2017), which will leads to higher earnings potential. By contrast, parents do not strongly expect their daughters to obtain high educational degrees, reflecting that most of them will leave the labor force when they have children (Brinton, 1993; National Institute of Population and Social Security Research, 2023). Women are expected to be "good housewives and wise mothers" who care for their husbands and provide intensive mothering (Hirao, 2001; Koyama, 2012). Higher levels of education are not strongly related to married women's labor force participation (Brinton & Lee, 2001; Raymo et al., 2023). The differences in expectations for educational attainment by gender may amplify the negative effect of "losing" educational competition and the positive impact of "winning" the competition, particularly for men. Thus, we hypothesized that the association between downward mobility and greater loneliness would be stronger in men than women

(**Hypothesis 2a**). By contrast, the association between upward mobility and lower loneliness was stronger for men than for women (**Hypothesis 2b**).

Methods

Data

We obtained the data from the Japan "Society and New Tobacco" Internet Survey (JASTIS; see Tabuchi et al. (2019) for the details) conducted in February 2022. Respondents were recruited from a survey panel managed by a nationwide Internet research agency, Rakuten Insight, which contains a pool of 2.2 million panelists (https://insight.rakuten.co.jp/). The survey collected information on respondents' and their parents' educational backgrounds as well as validated measures of loneliness (De Jong Gierveld & Van Tilburg, 2006, 2010) with an ample sample size, which allowed us to determine a relatively small effect of intergenerational mobility, as suggested in previous literature. In both descriptive and multivariate analyses, we used inverse probability weighting to adjust Internet survey respondents to approximate a nationally representative sample (Comprehensive Survey of Living Conditions 2019, conducted by Ministry of Health, Labour and Welfare).[2] We admit that the results may not be generalizable to the population even if correcting the sampling bias based on observable characteristics because the data was collected from the opt-in registered panel in an online survey. Future studies should examine whether these results can be applied to nationally representative large-scale social surveys or other data.

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[2] The Comprehensive Survey of Living Conditions of People on Health and Welfare collects information on health-related factors, such as self-rated health and smoking behavior, every three years. The inverse probability weight was estimated by the logit models predicting probability of response by residential area, marital status, education, home-ownership, self-rated health, and smoking status by the age and gender stratum.

The analytical sample consists of those aged 25–44 years (i.e., those born between 1978 and 1997), although the survey covers those aged 15–69. We excluded 15–24 years old respondents since many of them were still attending school and had not completed their education. Respondents aged 45 years and older were also excluded because many of them finished their education when educational expansion had not occurred, as previously argued, which would result in different characteristics from the recent cohort. While the original analytical sample contained 9,237 respondents, after excluding those who did not report valid responses on their mothers' or fathers' educational attainment ($N = 1,077$), their own educational attainment ($N = 58$), or household income ($N = 682$), the resultant sample size contained 7,623 respondents.

Diagonal reference model

We use the diagonal reference model (DRM) (Sobel, 1981, 1985) to estimate the effects of parental education, respondents' education, and mobility. Based on Blau's (1956) idea, DRM assumes that mobile members' attitudes, behaviors, and values are involved in the acculturation process (Sobel, 1981, 1985). While the behaviors or values of non-mobile members can be viewed as representative of each class, those of mobile members can be viewed as influenced by both non-mobile members of the origin and destination classes. This method is also suitable for avoiding the multicollinearity issues that may occur when capturing the effects of mobility in a traditional multiple regression model (Hendrickx et al., 1993).

Figure 2a shows a hypothetical mobility table. Diagonal cells indicate those with the same educational attainment as their parents (non-mobile members). Off-diagonal cells indicate those with educational attainment different from that of their parents (mobile members). All

mobile members had two reference groups: origin non-mobile members (ii) and destination non-mobile members (jj). The baseline model of DRM predicts the non-mobile and mobile members' levels of loneliness based on non-mobile parameters and the relative weight of the origin (p) and destination class ($1 - p$).

$$Y_{ijk} = \alpha + pu_{ii} + (1 - p)u_{jj} + X_k\beta + e_{ijk}, \quad (1)$$

where Y_{ijk} represents the score of the loneliness scale in cell ij of the mobility table with k observations, u_{ii} and u_{jj} represent the relative distance of the non-mobile individuals of the origin class (parents' educational attainment, in this study) and the destination class (respondent's educational attainment), X_k represents control variables, and e_{ijk} represents residuals. The sum of the diagonal parameters was constrained to zero and the sum of the relative weights of the origin and destination classes was constrained to one. Moreover, we introduce mobility direction dummies to the baseline model (1) as follows:

$$Y_{ijk} = \alpha + pu_{ii} + (1 - p)u_{jj} + \gamma_1 Upward_{ij} + \gamma_2 Downward_{ij} + X_k\beta + e_{ijk}, \quad (2)$$

where $Upward_{ij}$ represents dummy variables indicating whether individuals' educational attainment is higher than that of their parents (cells above the diagonal in Figure 2b) and $Downward_{ij}$ represents whether an individual's educational attainment is lower than that of their parents (cells below the diagonal in Figure 2b). The mobility effect is measured by γ_1 and γ_2, assuming the mobility effect is the same among all individuals who experienced upward or downward mobility. As a sensitivity check, we also introduce the variables differentiating "distance" of mobility as one-step, two-step, and three-step or further to measure if the mobility effect is similar among the upward and downward mobiles.

Variables

The dependent variable was the 6-item version of the De Jong Gieveld Loneliness Scale (De Jong Gierveld & Van Tilburg, 2006, 2010). Various measures of loneliness have been developed in previous studies (De Jong Gierveld & Kamphuls, 1985; Hughes et al., 2004; Russell et al., 1980). We utilized the De Jong Gierveld Loneliness Scale to measure emotional and social aspects of loneliness. Theoretically, loneliness is defined as the reflection of "an individual's subjective, cognitive evaluation of his or her social participation, or social isolation, against the standards held for optimal embeddedness in a social network" (De Jong Gierveld & Van Tilburg, 2010). The scale assesses two aspects of loneliness: emotional and social loneliness (De Jong Gierveld & Kamphuls, 1985). Emotional loneliness represents the feeling of the absence of an intimate relationship and consists of three negatively formulated items: "I experience a general sense of emptiness," "I miss having people around," and "I often feel rejected." Social loneliness relates to the feeling of the absence of engaging broader social networks and is comprised with three positively formulated items, "there are plenty of people that I can lean on in case of trouble," "there are many people that I can count on completely," and "there are enough people that I feel close to."[3] We constructed a count measure that summed each item after coding negatively formulated items as 1 ("more or less" or "yes") or 0 ("no") and positively formulated items as 1 ("more or less" or "no") or 0 ("yes"), which ranges from 0 to 6 (De Jong Gierveld & Van Tilburg, 2006, 2010). The Cronbach's alpha coefficient was 0.776, similar to previous studies (De Jong Gierveld & Van Tilburg, 2006).

We measured the educational attainment of the respondents' and their parents' in the same five categories: 1) junior high school, 2) high school, 3) junior college or vocational school (junior college hereafter), 4) university, and 5) graduate school, where higher values indicate a

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[3] While the original version of the items consists of 11-item (De Jong Gierveld & Kamphuls, 1985), this 6-item version is also validated by the following studies (De Jong Gierveld & Van Tilburg, 2006, 2010).

higher educational degree. Respondents' education was measured as the most recent educational institution to which they had attended. Parental education was measured as the higher the father's and mother's education levels. If a respondent did not report either the father's or mother's education, the respondent with a valid response was used.

By cross-classifying parents' and respondents' education, we constructed intergenerational mobility variables, indicating 1) downward mobility: respondents have a lower level of education than their parents, 2) upward mobility: respondents have a higher level of education than their parents, and 3) immobility: respondents have the same level of education as their parents. Moreover, we distinguished between short- and long-distance mobility by separating them into one step downward (i.e., downward mobility from high school to junior high, junior college to high school, university to junior college, and graduate school to university), two or more steps downward (i.e., other downward mobility), one step upward, and two or more steps upward mobility, the step of which is measured as the difference between the respondents' and parents' level of education.

We controlled for several demographic and socioeconomic factors. Age, age squared, and gender (men or women) were controlled for in all models as basic demographic attributes. In addition, socioeconomic attributes, such as marital status (never married, married, widowed, or divorced), household size[4], work status (working or not working), and logged household income[5] were introduced. These variables can be regarded as mediating factors between parents and respondents' educational attainment, mobility, and loneliness. However, our focus was on intergenerational educational mobility experiences associated with current loneliness, even after

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[4] If the reported number of household members was more than 10, it was coded as 10.
[5] The JASTIS collects information on household income in the previous year with 18 categories. It was transformed into a continuous variable by taking the midpoint of each interval. The values are log-transformed to capture the non-linear relationship of increased growth in loneliness.

controlling for standard correlates of loneliness. The significant associations between intergenerational educational mobility and current loneliness suggest that the impact of educational mobility persists in the long term.[6]

The descriptive statistics are shown in Table 1.

Results

Descriptive results

Table 2 presents the intergenerational mobility table, which shows the relationship between the parents' and respondents' educational attainment. Diagonal cells indicate individuals who remained immobile after attaining the same educational degree as their parents. Cells below the diagonal represent downward mobility, whereas those above the diagonal represent upward mobility. Of all the respondents, 9% (=687/7623) were 687 downwardly mobile, while 36% (=2762/7623) were upwardly mobile, indicating that the number of upward mobiles was four times higher than that of downward mobiles, highlighting the overall educational expansion during the period studied.

Figure 3 shows the means of the loneliness scale based on the parents' and respondents' education. Individuals experiencing downward mobility reported higher levels of loneliness than immobile respondents with the same level of educational attainment. Specifically, respondents whose parents had a high school or higher education level but had moved downward to junior high school reported higher levels of loneliness than did immobile junior high school graduates (first column). Similarly, individuals whose parents have a junior college or higher degree and

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[6] We also estimated the models that does not control for these socioeconomic attributes and confirmed that the main results do not significantly vary (available upon request).

who have experienced downward mobility also report higher levels of loneliness than do immobile high school graduates (second column).

Results of the diagonal reference models

Table 3 shows the results of the DRMs that predicted loneliness scores. Model 1 introduces diagonal and weight parameters as well as control variables. Higher levels of education at the origin or destination were associated with lower levels of loneliness. Individuals and parents with graduate school degrees showed 0.737 (=0.316 + 0.421) points lower loneliness scores than those with junior high school degrees. Moreover, controlling for other variables, individuals' levels of loneliness were influenced more by their parents' education than by their own. The weight of parental education was higher (0.824) than that of respondents' education (0.176). This finding suggests that social origin is significantly associated with loneliness beyond educational attainment and the other control variables.

In addition to origin and destination influences, downward mobility was significantly associated with loneliness. Model 2, which introduces the downward and upward mobility dummies, reveals that downward mobility is significantly associated with 0.221 points higher scores of loneliness compared to immobile individuals, controlling for other control variables and origin and destination influences. The coefficient of upward mobility was 0.124; however, this was not statistically significant. These results are consistent with Hypothesis 1a, which expected downward mobility to be associated with higher loneliness, but do not support Hypothesis 1b, which insists that upward mobility is linked to lower levels of loneliness.

In particular, men contributed to the effect of downward mobility on loneliness. Model 3, which introduces interaction terms between the mobility parameters and gender, shows that the

18

effect of downward mobility is significantly greater for men. While men who experienced

downward mobility had 0.448 points (=0.010+0.438) higher loneliness scores than those who did

not move, this corresponds to 0.010 points for women. The effect of upward mobility did not

vary significantly between the sexes. These results are consistent with Hypothesis 2a, which

insists that the effect of downward mobility on loneliness is greater for men than for women, but

inconsistent with Hypothesis 2b, which argues that the protective effect of upward mobility on

loneliness is larger for men.

We further decomposed mobility by separating the mobility distances. Model 4 in Table

4 shows that one- and two-step downward mobilities were associated with higher loneliness

scores, corresponding to 0.202 and 0.311 points, respectively. Three or more steps of downward

mobility are also associated with higher loneliness scores, but it is not statistically significant due

to large standard errors. The magnitudes of the coefficients are similar, suggesting that

downward mobility does not have different effects on loneliness depending on the "distance" of

the move. Upward mobility is not significantly associated with the levels of loneliness,

regardless of the "distance" of the move. Finally, Model 5 shows that the effect of a one-step

downward move on loneliness is stronger for men than for women. All interaction terms between

downward mobility and gender had positive values, but two-step moves and three or more steps

of downward mobility had no significant effects. These results suggest that the larger effect of

overall downward mobility for men is driven mainly by a one-step downward movement. The

interaction between upward mobility and gender did not show a significant relationship with

loneliness. In summary, the decomposition of mobility distance supports the finding that

downward mobility is associated with higher overall loneliness, controlling for other variables

and origin and destination influences, and that the effect is larger for men than for women.

Discussion and Conclusion

Intergenerational mobility has various implications for social, psychological, and health outcomes. We examined the relationship between intergenerational educational mobility and loneliness, which has not yet been fully explored. Using diagonal reference models of recently collected survey data in Japan, we examined the consequences of intergenerational educational mobility on loneliness levels, measured using the De Jong Gievald Loneliness Scale. The results showed that downward intergenerational educational mobility was associated with greater loneliness, whereas upward mobility was not associated with loneliness, controlling for demographic attributes, socioeconomic attributes, and origin and destination influences. The negative consequence of downward mobility is consistent with the "falling from grace" hypothesis that expects downward mobility to create the negative feelings for the downwardly mobile (Newman, 1999). Contrary to expectations that intergenerational mobility is associated with greater loneliness regardless of direction (Sorokin, 1959) or weakens the level of loneliness (Gugushvili, Zhao, et al., 2019), upward mobility was not significantly associated with loneliness. Furthermore, the significant effect of downward mobility rejects Blau's (1956) explanation that mobility itself does not affect loneliness. These findings suggest that the competitions for educational attainment or the prevalence of the norms of meritocratic educational systems in Japan may create the sense of "defeat" for the downwardly mobile individuals, leading to their greater emotional and social loneliness.

Additionally, the results showed that the effect of downward mobility on loneliness was significantly greater in men than in women. This finding suggests that the pressure to avoid downward educational mobility may be greater for men. Owing to gendered expectations, men

are expected to obtain higher educational degrees and labor market success. The strong pressure of competition or meritocratic ideals heightened emotional and social loneliness in men who experienced downward educational mobility. While this study only analyzed data from Japan, the findings may be applicable to other societies, such as East Asian countries, which are also characterized by the prevalence of traditional gender norms (Raymo et al., 2015) and examination-based education systems (Hannum et al., 2019).

The results were obtained from a survey conducted during the COVID-19 pandemic (February 2022). Studies have shown that people experience increased feelings of loneliness during the COVID-19 pandemic (Ernst et al., 2022). Despite this unusual situation, intergenerational educational mobility still has a significant effect on loneliness, even after controlling for proximate causes such as income, marital status, and employment. Similar to other psychological and health outcomes, loneliness is influenced by past mobility experiences.

This study has several limitations. First, the results may not be generalizable to the population as the data we use is the opt-in web survey. Although we controlled for standard demographic and socioeconomic characteristics, and applied survey weights to represent the population, unobserved characteristics may have confounded our results. Second, the measure of educational attainment did not distinguish between horizontal differences within education. Studies suggest that university selectivity is significantly linked to labor market stratification in Japan (Fujihara & Ishida, 2016; Ishida et al., 1997). In this context, downward educational mobility, in terms of university selectivity, may have an impact on loneliness. Third, we did not analyze differences in the impact of intergenerational mobility by age or cohort (Kwon, 2022). The effect of experiencing downward educational mobility may weaken with age, while the

cohort context may moderate the effect of mobility. Repeated surveys will allow us to disentangle the age and cohort mechanisms.

In conclusion, we advance the literature by examining the impact of intergenerational mobility on loneliness. Recent studies have demonstrated the negative consequences of downward intergenerational mobility on various social attitudes. These results imply that social hierarchy degrades dignity when experiencing downward mobility. Our study provides evidence for the negative impact of downward mobility on heightened feelings of loneliness. Thus, an individual's current status does not solely constitute loneliness but is formed by a complex interaction of many factors, including past experiences, social context, and the roles expected of members of society. This suggests that loneliness should be addressed by focusing not only on the individual's current situation but also on his or her experience and social context. Further studies are required to examine the relationship between intergenerational mobility, particularly downward mobility, and subsequent social outcomes in various contexts.

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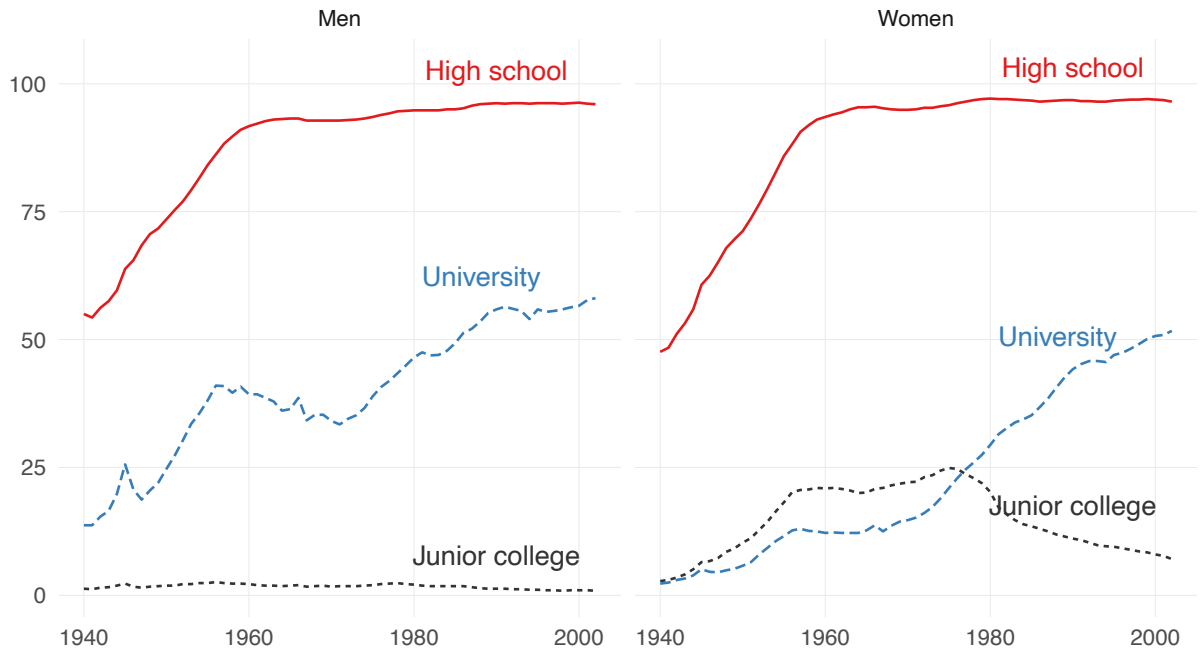   *Stratification and Mobility*, *48*, 54–66.

Figure 1. Cohort trends in enrollment rate of high school, junior college, and university in Japan by gender.
Notes. The values for each year were retrieved from the School Basic Survey (Ministry of Education, Culture, Sports, Science, and Technology). The high school enrollment rate was calculated as the number of students entering high school divided by the number of students graduating from junior high school one year earlier. Similarly, the junior college or university enrollment rate was determined by dividing the number of students enrolled in junior college or university by the number of students graduating from junior high school four years earlier. The year was transformed into the birth cohort by subtracting 15 (standard high school enrollment age) from the high school enrollment rate, and 18 (standard junior college or university enrollment age) from the junior college and university enrollment rates.
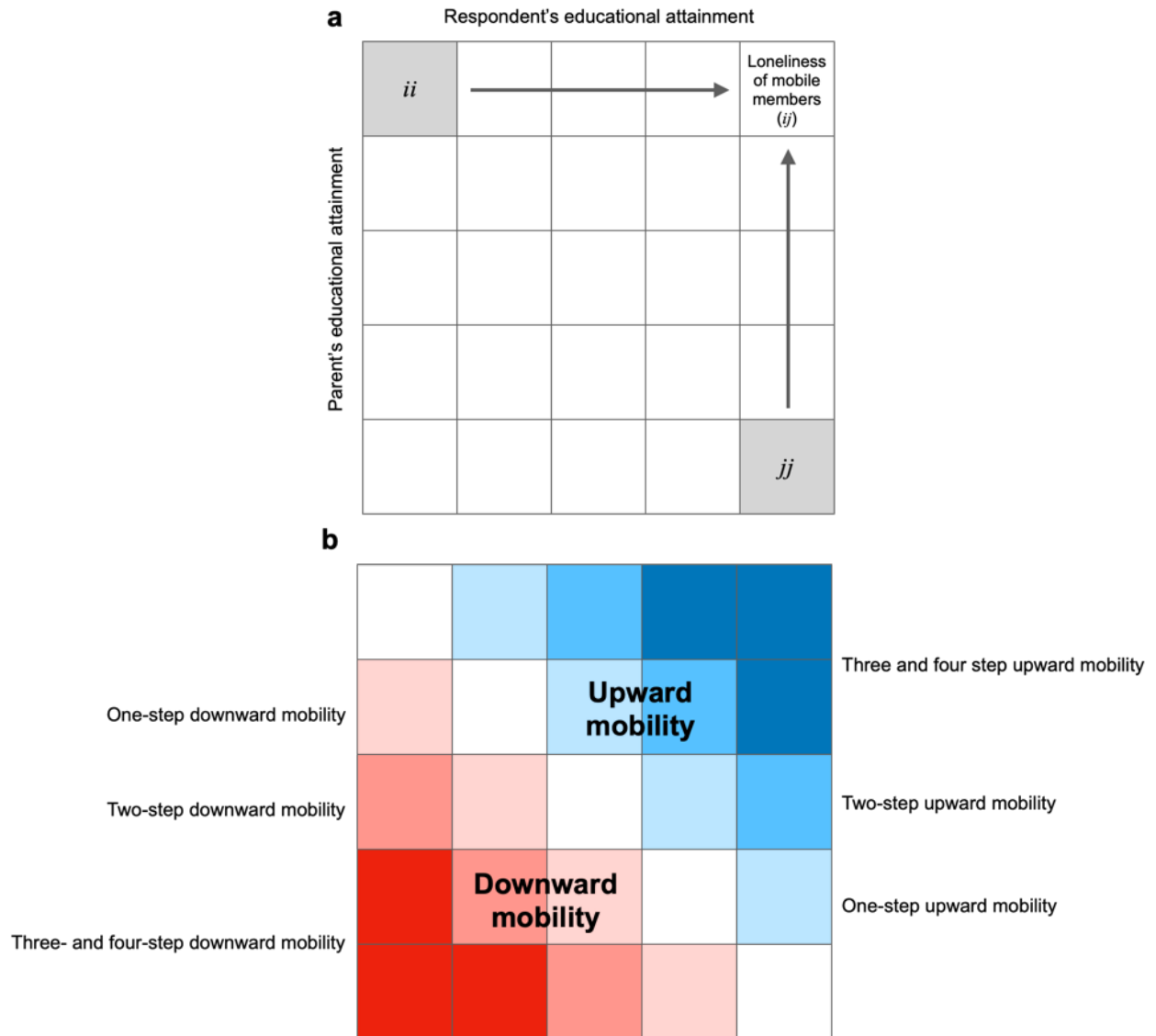
Figure 2. (a) Loneliness of mobile members in diagonal reference model; (b) Definition of upward and downward mobility
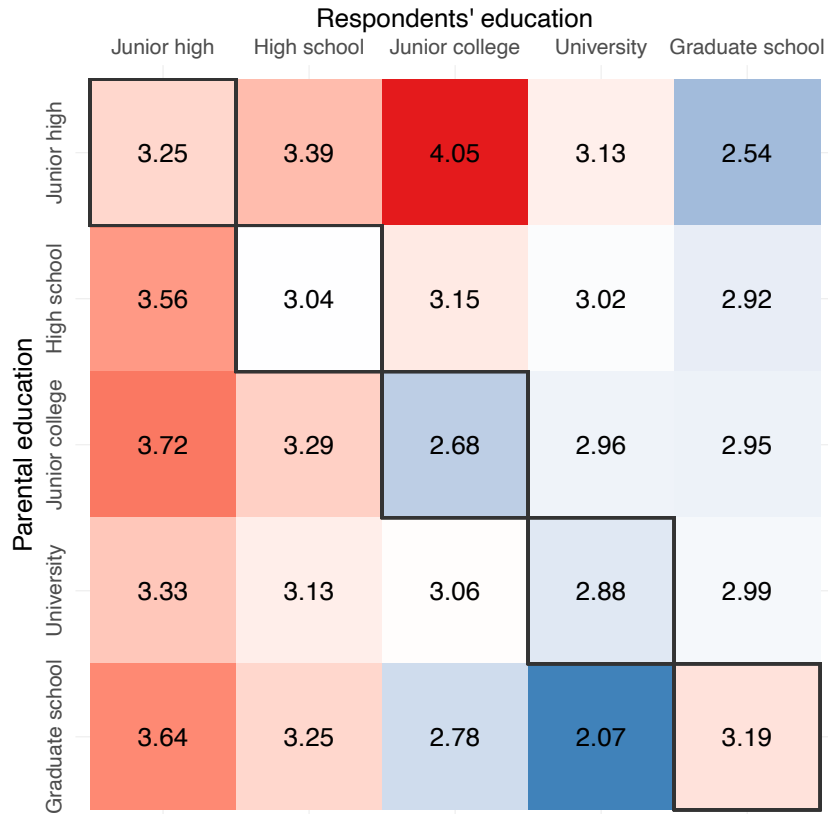
Figure 3. Mean values of De Jong Gierveld Loneliness Scale (0–6) by parental and respondents' education

Notes. Red areas indicate higher values of loneliness and blue areas indicate lower values. The observations were weighed.

Table 1. Descriptive statistics

	Mean / Prop.	SD	Min	Max
De Jong Gieveld loneliness scale	3.046	2.000	0	6
Parental education				
Junior high	0.043			
High school	0.431			
Junior college	0.184			
University	0.326			
Graduate school	0.015			
Respondents' education				
Junior high	0.014			
High school	0.381			
Junior college	0.246			
University	0.319			
Graduate school	0.039			
Gender				
Men	0.530			
Women	0.470			
Age	34.527	5.997	25	44
Marital status				
Never married	0.607			
Married	0.354			
Widowed	0.001			
Divorced	0.038			
Household size	3.123	1.379	1	10
Work status				
Not working	0.147			
Working	0.853			
Logged household income	5.907	1.201	0	7.864
N	7,623			

Table 2. Intergenerational mobility table between parental and respondents' education

Parental education	Respondents' education					
	Junior high	High school	Junior college	University	Graduate school	Total
Junior high	37	210	54	25	4	331
	(11.2)	(63.6)	(16.4)	(7.7)	(1.1)	(100.0)
High school	73	1,772	818	565	61	3,289
	(2.2)	(53.9)	(24.9)	(17.2)	(1.8)	(100.0)
Junior college	57	478	474	355	35	1,400
	(4.1)	(34.2)	(33.9)	(25.4)	(2.5)	(100.0)
University	41	530	665	1,089	161	2,485
	(1.6)	(21.3)	(26.8)	(43.8)	(6.5)	(100.0)
Graduate school	4	20	19	52	23	118
	(3.3)	(17.2)	(16.3)	(43.8)	(19.5)	(100.0)
Total	212	3,010	2,030	2,086	284	7,623
	(2.8)	(39.5)	(26.6)	(27.4)	(3.7)	(100.0)

Notes. Row percentages are in parentheses. Observations are weighted.

Table 3. Estimates of diagonal reference models predicting De Jong Giervald Loneliness Scale.

	Model 1		Model 2		Model 3	
Diagonal parameters						
u11 (Junior high)	0.316	(0.202)	0.306†	(0.181)	0.288†	(0.172)
u22 (High school)	0.099	(0.092)	0.160†	(0.087)	0.152†	(0.083)
u33 (Junior college)	0.005	(0.103)	-0.004	(0.100)	-0.015	(0.093)
u44 (University)	0.002	(0.132)	0.026	(0.088)	0.035	(0.082)
u55 (Graduate school)	-0.421*	(0.197)	-0.487*	(0.197)	-0.460*	(0.194)
Weight parameters						
Parental education (p)	0.824*	(0.408)	0.871***	(0.242)	0.954***	(0.248)
Respondent's education (1-p)	0.176	(0.408)	0.129	(0.242)	0.046	(0.248)
Mobility parameters						
Downward mobility			0.221*	(0.104)	0.010	(0.140)
Upward mobility			0.124	(0.094)	0.118	(0.129)
Downward mobility x Men					0.438*	(0.205)
Upward mobility x Men					-0.004	(0.162)
Control variables						
Men	0.293***	(0.080)	0.293***	(0.079)	0.197	(0.120)
Age	0.025***	(0.006)	0.025***	(0.006)	0.026***	(0.006)
Marital status (ref: Married)						
Never-married	0.775***	(0.088)	0.776***	(0.088)	0.768***	(0.088)
Widowed	1.440***	(0.352)	1.527***	(0.331)	1.507***	(0.351)
Divorced	0.449†	(0.229)	0.458*	(0.229)	0.462*	(0.228)
Household size	-0.016	(0.031)	-0.016	(0.030)	-0.015	(0.031)
Working	0.041	(0.110)	0.055	(0.109)	0.056	(0.109)
Logged household income	-0.220***	(0.032)	-0.216***	(0.032)	-0.219***	(0.032)
Intercept	2.987***	(0.320)	2.841***	(0.317)	2.894***	(0.320)
N	7623		7623		7623	

Notes. † p < .1, * p < .05, ** p < .01, *** p < .001 (two-tailed tests). The observations were weighed. Robust standard errors are indicated in parentheses.

Table 4. Estimates of diagonal reference models predicting De Jong Giervald Loneliness Scale, separating the distances of moves

	Model 4		Model 5	
Diagonal parameters				
u11 (Junior high)	0.294†	(0.170)	0.286†	(0.168)
u22 (High school)	0.165*	(0.084)	0.164†	(0.084)
u33 (Junior college)	-0.003	(0.090)	-0.018	(0.089)
u44 (University)	0.010	(0.092)	0.028	(0.093)
u55 (Graduate school)	-0.465*	(0.183)	-0.460*	(0.191)
Weight parameters				
Parental education (p)	0.965**	(0.338)	0.983**	(0.330)
Respondent's education (1-p)	0.035	(0.338)	0.017	(0.330)
Mobility parameters				
1 step downward mobility	0.202†	(0.117)	-0.008	(0.154)
2 step downward mobility	0.311†	(0.185)	0.091	(0.251)
3+ step downward mobility	0.248	(0.653)	0.104	(0.675)
1 step upward mobility	0.144	(0.121)	0.111	(0.151)
2 step upward mobility	0.029	(0.138)	0.134	(0.187)
3+ step upward mobility	0.057	(0.284)	-0.182	(0.486)
1 step downward mobility x Men			0.463*	(0.228)
2 step downward mobility x Men			0.380	(0.345)
3+ step downward mobility x Men			0.292	(1.284)
1 step upward mobility x Men			0.067	(0.187)
2 step upward mobility x Men			-0.137	(0.214)
3+ step upward mobility x Men			0.342	(0.491)
Control variables				
Men	0.296***	(0.079)	0.196	(0.120)
Age	0.025***	(0.006)	0.026***	(0.006)
Marital status (ref: Married)				
Never-married	0.778***	(0.088)	0.770***	(0.088)
Widowed	1.529***	(0.334)	1.510***	(0.354)
Divorced	0.452*	(0.230)	0.457*	(0.229)
Household size	-0.017	(0.030)	-0.015	(0.031)
Working	0.055	(0.109)	0.056	(0.108)
Logged household income	-0.215***	(0.032)	-0.218***	(0.032)
Intercept	2.834***	(0.318)	2.881***	(0.322)
N	7623		7623	

Notes. † $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed tests). The observations were weighed. Robust standard errors are indicated in parentheses.