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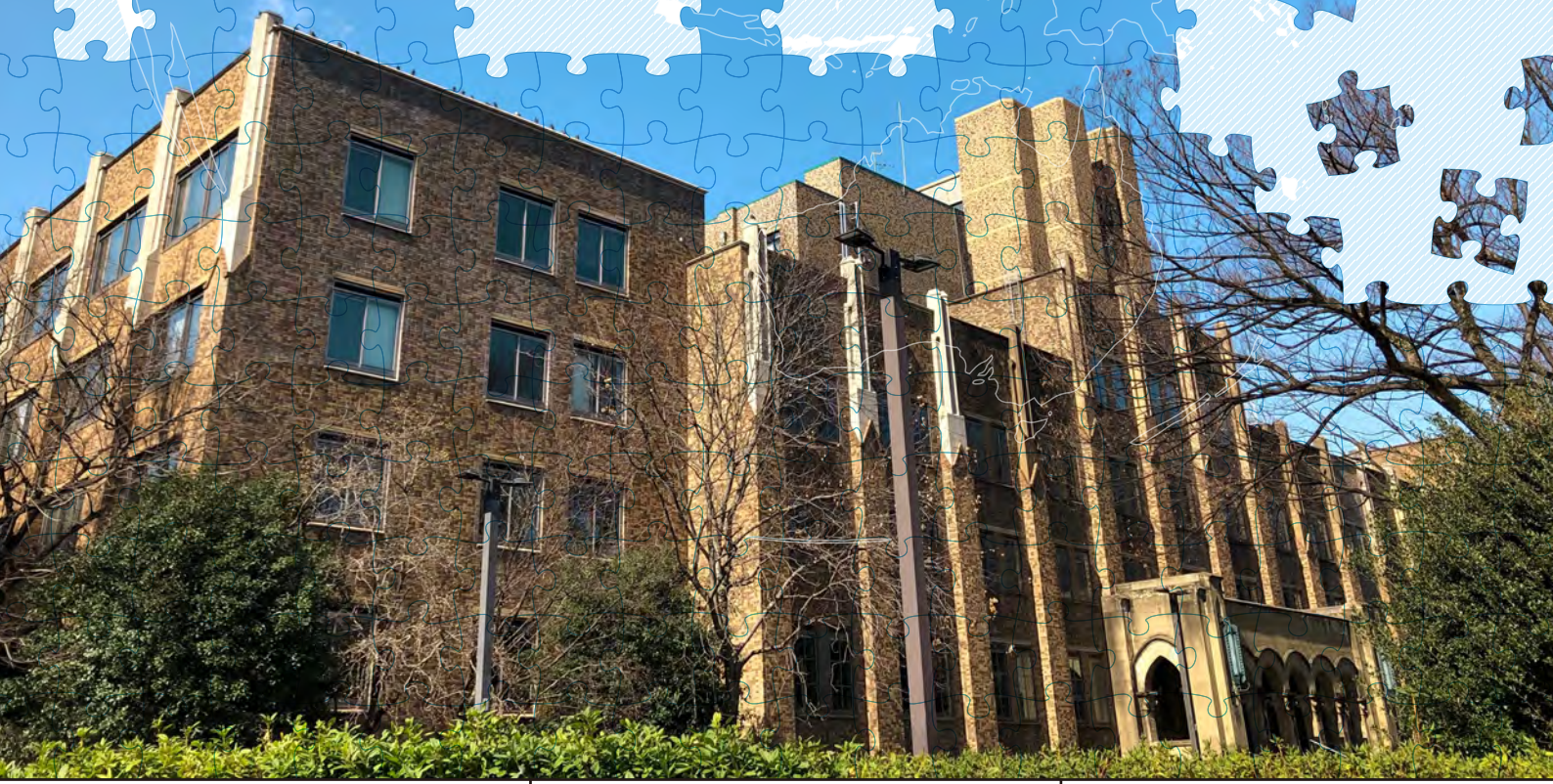

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Explaining Class Differences in Educational Attainment in Japan:

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Abstract

Japan experienced rapid educational expansion after World War II, but social class differences in educational attainment still exist. To explain this persistent educational inequality, I ask whether the Breen and Goldthorpe (BG) rational action model could help explain the association between class origin and educational attainment. Using data from the Japanese High School Students and Mothers Survey conducted in 2012 and its follow-up waves (n = 1,070), I obtain the following results: (1) a student's subjective probability of success and subjective benefits in terms of status maintenance are affected by his or her class origin, but that student's subjective cost of education and motivation for status maintenance are not; (2) a student's subjective cost, probability of success, and benefits affect educational attainment; (3) among those students with greater motivation for status maintenance, the effects of their subjective benefits are stronger; and (4) the subjective evaluations of educational options explain little of the effect of class origin on educational attainment. Although these findings mainly concur with the assumptions and predictions derived from the BG model of educational decision making, the explanatory power of the model is not very strong, indicating the limited validity of the model for understanding the mechanisms underlying educational inequality in Japan.

Keywords Educational inequality; Social class; Rational action theory; Relative risk aversion; Japan

1. INTRODUCTION

This study employs the Breen and Goldthorpe (BG) model (1997) to explain class differences in educational attainment, develops an alternative to the analytical framework used in previous studies, and assesses the validity of the BG model.

In the volume entitled *Persistent Inequality*, Shavit and Blossfeld (1993) found that out of thirteen industrialized countries, educational inequality had decreased only in the Netherlands and Sweden. The authors drew the following conclusion: "[Whereas] the proportions of all social classes attending all educational levels have increased, the relative advantage associated with privileged origins persists in all but two of the thirteen societies" (Shavit & Blossfeld, 1993, p. 22). Although recent studies have indicated that class inequality in education has decreased (e.g., Breen et al., 2009), substantial class inequality still exists in educational attainment in many societies.

To explain the mechanism behind the established macrosocial regularity of the persistence of educational inequality, Goldthorpe (1996) proposed a rational action theory of educational decision making.[1] His argument was based on Boudon's (1974) primary and secondary effects: the former is the effect of class origin on educational attainment through cognitive abilities or academic performance in school, and the latter is the effect of class origin on the choice of educational option. Educational choice is viewed as a rational choice based on the calculation of the costs, benefits, and probability of success of each educational option, which depend on the social position of those who make the choice (Boudon, 1974; Erikson & Jonsson, 1996; Keller & Zavalloni, 1964). Goldthorpe insisted on the importance of choice in explaining the mechanisms behind the persistent inequality in education. Thus, he focused on secondary rather than primary effects[2] to explain these mechanisms, providing predictions and implications derived from his theory (Goldthorpe, 1996). Breen and Goldthorpe (1997) mathematically formalized Goldthorpe's initial theory

and attributed class differences to three main mechanisms: (1) class differences in academic ability and expectations for success, (2) class differences in economic resources, and (3) relative risk aversion (RRA). The BG model attaches more importance to RRA than to the other two mechanisms, although all three are related.

As explained in the next section, many studies have empirically tested the BG model and the RRA hypothesis, especially in European contexts. This study contributes by critically evaluating how the two key concepts in BG model—the subjective benefits of education and the motivation for status maintenance—have been analysed in previous studies. Furthermore, it introduces an alternative analytical framework and assesses whether the BG model of educational decision making explains the effects of class origin on educational attainment in an East Asian society, Japan, where class inequalities in educational attainment and intergenerational class mobility have remained stable and where class matters, as well as it does in the context of European societies.

2. BG MODEL AND PREVIOUS STUDIES

RRA, which is assumed to be the central mechanism underlying class differences in the BG model, is defined as the tendency of all families to similarly seek to ensure that their children acquire a class position perceived to be at least as advantageous as that of their parents. The BG model of RRA has two components. First, families of all classes have identical relative risk aversion and want their children to avoid being in a worse future social position than their parents (Breen and Goldthorpe 1997, p. 283). Second, families perceive some educational choices as having the risk of downward social mobility, and this perception varies depending on their social position (Boudon, 1974; Keller & Zavalloni, 1964). Because, as a general rule in industrial societies, there is a strong relationship between educational attainment and class destination, it is assumed that children and their

families pursue sufficient education to enable them to avoid downward social mobility. Thus, education is an investment good (Goldthorpe, 1996; Thurow, 1972). Children from advantaged classes whose parents work as professionals or managers (upper service classes) are expected to acquire higher qualification levels to avoid downward mobility. In contrast, children from less advantaged families with nonskilled or farming backgrounds do not need to pursue education as much as their more advantaged counterparts. In this way, the BG model explains why students from upper classes (and their parents) are more ambitious about pursuing higher levels of educational certifications with a high risk of failure than those from less advantaged classes, even after the effects of socioeconomic background on academic competence have diminished and participation in education is made free of charge. By focusing on RRA, the BG model reveals that the interactions among social positions, the educational system, and the social structure affect the educational decision making of families and lead to macrosocial regularity in the class differences in educational inequality (Goldthorpe, 2007).

Many studies have tested BG theory both directly and indirectly, especially by focusing on the RRA hypothesis (Barone et al., 2018; Becker, 2003; Becker & Hecken, 2009a, 2009b; Breen & Yaish, 2006; Davies et al., 2002; Gabay-Egozi et al., 2010; Goldthorpe, 2007; Kroneberg & Kalter, 2012; Need & de Jong, 2001; Stocké, 2007; Tolsma et al., 2010; Van de Werfhorst & Andersen, 2005; van de Werfhorst & Hofstede, 2007; Zimmermann, 2020). Some studies have indirectly tested the RRA hypothesis by investigating whether the relationship between socioeconomic status and educational choice is consistent with that predicted by the RRA mechanism (Breen & Yaish, 2006; Davies et al., 2002; Holm & Jæger, 2008; Need & de Jong, 2001; Van de Werfhorst & Andersen, 2005). These indirect tests show that the patterns of association between socioeconomic background and educational attainment are, to a large extent, consistent

with those predicted by the RRA hypothesis and mainly support it, although some tests do not (Breen & Yaish, 2006; Davies et al., 2002).

Other scholars have directly tested the RRA hypothesis by adopting a social-psychological approach, that is, by operationalizing individuals' subjective costs, subjective probability of success, subjective benefits of education in terms of maintaining their social position, and motivation for status maintenance and by investigating the effect of these factors on educational decision making (Barone et al., 2018; Gabay-Egozi et al., 2010; Stocké, 2007; van de Werfhorst & Hofstede, 2007; Zimmermann, 2020).

Regarding the effect of class origin on subjective evaluations, previous studies have shown that subjective costs are not related to class origin (Abbiati & Barone, 2017; Barone et al., 2018; Stocké, 2007).[3] Abbiati and Barone (2017) and Stocké (2007) found that the subjective probability of success is affected by class origin, but Gabay-Egozi et al. (2010) did not reach the same conclusion. Subjective benefits or utility in terms of economic success and status maintenance are related to class origin (Abbiati & Barone, 2017; Gabay-Egozi et al., 2010; Stocké, 2007).

With respect to the effect of subjective evaluations on educational choices, previous studies in Europe found that subjective costs were not related to educational choices (Stocké, 2007) and that the subjective probability of success affected educational choices (Gabay-Egozi et al., 2010; Stocké, 2007; Tolsma et al., 2010). Subjective benefits (or returns or rewards) affect educational attainment. Barone et al. (2018) found that perceived returns and expected wage returns increased the probability of university enrolment. Gabay-Egozi et al. (2010) also found that subjective utility from university admissions affected educational choices. Stocké (2007) measured parental evaluations of the suitability of degrees for status maintenance and showed that these evaluations were an important factor in the choice of secondary schools.

Although these studies differ in their methods of measuring subjective evaluations and in the types of educational choices they study, these results indicate that the family's social position affects evaluations of educational options and that, in turn, these evaluations affect educational choices. However, the relationship between these subjective evaluations of educational options and the motivation for status maintenance and its impact on educational choices have rarely been discussed.

Some direct evaluations of the BG model have operationalized the motivation for status maintenance or the concern about status demotion. The RRA hypothesis assumes that children and their families from all social backgrounds *similarly* seek to ensure the acquisition of a level of education for their children that allows them to avoid downward social mobility (Breen & Goldthorpe, 1997). As a result, class origin has no effect on the desire to avoid downward social mobility. Van de Werfhorst and Hofstede (2007) indicated that concern about downward social mobility differs little across social classes and the educational levels of parents, as expected by the RRA hypothesis, but substantially affects schooling ambitions. As van de Werfhorst and Hofstede (2007) observed, the impact of this motivational factor is inevitably additive to the impact of social origin on educational attainment and does not mediate the effect of class origin on educational choices. Moreover, Gabay-Egozi et al. (2010) found that students from more advantaged families were less concerned about status maintenance. Stocké (2007) also found that compared with the upper service class, mothers from the routine-nonmanual employment and self-employment classes had a stronger motivation for status maintenance. However, Gabay-Egozi et al. (2010) and Stocké (2007) found that the motivation for status maintenance was not related to educational choices. These results are not strictly comparable, but in general, the motivation for status maintenance does not mediate the effect of class origin on educational choices.

Previous studies dealing with subjective evaluations have not adequately identified the role of motivation for status maintenance in educational choice, and previous studies focusing on the motivation for status maintenance have not bridged the link between class origin and educational attainment. These two components need to be analysed in combination rather than separately. The BG model assumes that children and their families from all social backgrounds *similarly* seek to ensure suitable levels of education to avoid downward social mobility, but this does not mean that *all* of them want to do so. Some of them want to while others do not, and there are no class differences in the average level of the motivation for status maintenance. Although some previous studies have focused on the motivation for status maintenance or concerns about status demotion, the subjective benefits of education in terms of status maintenance should be the central mechanism by which class origin affects educational decision making in the BG model. Theoretically, the motivation for status maintenance does not mediate the effect of class origin on educational choice (Barone et al., 2018, 2021; Tutić, 2017), as previous studies have empirically demonstrated (Gabay-Egozi et al., 2010; Stocké, 2007; van de Werfhorst & Hofstede, 2007); instead, it should be treated as an effect modifier that amplifies or reduces the effect of the subjective benefits in terms of status maintenance on educational choices (c.f., Becker, 2003). In other words, for those who desire to avoid downward mobility, the subjective benefits of education in terms of status maintenance are more critical in educational decision making than they are for those who care less about status maintenance. Considering the role of the two components of RRA in this way allows us to test the RRA hypothesis by successfully combining and extending the two types of approaches applied in previous studies (perceived benefits in terms of status maintenance and motives for status maintenance).

Based on the above discussion, this study focuses on the effect of the subjective benefits of education on status maintenance as the central mechanism and the modification of the subjective benefit effect by the motivation for status maintenance. I use longitudinal data from Japan, which enables me to directly test the BG model by providing subjective measures of senior high school students and their educational attainment as well as accurate socioeconomic background information collected from their mothers.

3. INSTITUTIONAL SETTING

Before testing the hypotheses, I briefly introduce the Japanese setting, focusing especially on secondary and postsecondary education. For details on the educational system in Japan, see Ishida (2007).

Since World War II, Japan has experienced rapid educational expansion. The Basic School Survey conducted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in Japan indicates that in April 2012, almost all junior high school students entered high school (HS) after graduation (boys: 98.0%, girls: 98.6%), and approximately 70% of HS graduates entered postsecondary education. Japanese HS students have a choice of whether to continue in or leave the educational system after graduation. If they continue, they must select from three main types of postsecondary education: (1) professional training college (PTC; men: 13.6%, women: 20.0%); (2) junior college (JC), which includes a more advanced professional school (men: 1.0%, women: 10.0%); (3) and four-year university, which includes six-year programmes in medicine and pharmacy (UNIV; men: 50.3%, women: 44.8%). PTCs provide technical professional training to students and allow them to acquire various technical skills, such as engineering, programming, linguistic knowledge, hairdressing, and nursing. JCs offer two-year programmes for acquiring vocational skills and three-year programmes for nursing and

medical engineering. UNIVs offer traditional bachelor's degree programmes, which usually require four years of study to complete (six years for medicine and pharmacy). A detailed hierarchical structure exists for Japanese universities based on academic selectivity and prestige (Kariya 2011). The detailed order of the selectivity of universities is indicated by a standardized rank score with a mean of 50 and a standard deviation of 10 (*hensachi* in Japanese). Despite this detailed horizontal stratification in university education (Gerber & Cheung, 2008), this study focuses on vertical educational stratification (HS, PTC, JC, and UNIV) because the differences between vertical educational levels are still more important in Japan (Kikkawa, 2006).

Although Japan has experienced rapid educational expansion since World War II, the social class differences in educational attainment have remained stable (Fujihara & Ishida, 2016; Ishida, 2007). **Figure 1** shows the relationship between class origin based on the father's occupation, as measured by a four-category version of the EGP class scheme (Erikson et al., 1979), and UNIV enrolment, derived from data from the Social Stratification and Social Mobility (SSM) surveys conducted in Japan every ten years from 1955 to 2015. In general, individuals with upper and lower service class origins (Classes I and II) are considered more likely to attend a UNIV than those with any other class origin. Individuals with intermediate class origins (Classes IIIab and IVab) are more likely to attain higher levels of education than individuals with farming and working class origins (Classes IVc, V, VI, and VIIab).

The cost of completing higher education in Japan is expensive. Government spending on public education in Japan is low; thus, the burden of higher education on households is high. According to the report "Education at a Glance 2019" by the Organization for Economic Cooperation and Development (OECD), public expenditure on education dropped between 2010 and 2016 (OECD, 2019). Public expenditure as a percentage of total

government expenditure is less than the OECD average (less than 8.0%), and households bear a large share of the costs of higher education. The average cost (excluding living expenses, etc.) of graduation from a university was 2,626,400 Japanese yen (21,886 USD at an exchange rate of 120 Japanese yen to one USD) for a national university and 5,267,200 Japanese yen (43,893 USD) for a private university in 2010 (MEXT, 2013).

There are obvious returns to a university education in Japan. The economic returns to a UNIV education have been stable despite the rapid expansion of education (Kawaguchi & Mori, 2016). Previous studies have shown that education is strongly associated with occupational attainment and class destination (Hannum et al., 2019; Ishida et al., 1995). Therefore, education is important for maintaining at least the same level of social status as one's parents and thus avoiding downward mobility.

Regarding the probability of success, entrance examinations for selective universities are very competitive. It is difficult to obtain acceptance from Japanese universities; however, it is easy to graduate from them. In recent years, while the birth rate has declined rapidly, the overall number of university seats is increasing. It has even been said that anyone can go to a university if they want to because so many universities have been established and entrance examinations have become more diverse and less competitive (Amano & Poole, 2005). However, even though graduating from college in Japan is said to be easy, once students enter a UNIV, they are required to make academic commitments to successfully graduate. An internet survey conducted in Japan showed that poor academic performance was the most frequently cited reason for dropping out of higher education (Shimosegawa, 2016).

Kondo (2002: 77) argued that because in Japan the demand for education is generally high and the benefits of education are uniformly perceived by individuals from different social positions, the RRA is not valid for explaining educational inequality in Japanese

society. However, such predictions have not been directly tested. Previous studies that directly tested the BG model have used data from Germany, Israel, Italy, and the Netherlands, but the present study is the first attempt to conduct a direct test using data from a non-European society—Japan. The contribution of this study is to examine whether the BG model is valid in a context different from European contexts.

[FIGURE 1 ABOUT HERE]

4. HYPOTHESES

To examine the validity of the BG model for Japanese society, I test the following four hypotheses. According to the model, class origin affects students' subjective costs, probability, and benefits.

Hypothesis 1: Students' subjective costs, probability of success, and benefits are affected by their class origin.

I use the motivational factor as a dependent variable to test the assumptions of the BG model; students from all class origins have this motivation. Because all social classes are equally concerned about status maintenance (Breen & Goldthorpe, 1997), class origins are not associated with the desire to avoid downward social mobility.

Hypothesis 2: Students' motivation for status maintenance is independent of their class origin.

The subjective costs, probability, and benefits are, in turn, expected to affect educational attainment.

Hypothesis 3: Subjective costs, probability of success, and benefits affect educational attainment.

Although previous studies have suggested that the motivation for status maintenance is related to educational choice or attainment (e.g., Stocké, 2007), I focus on another role of motivation for status maintenance, that of a modifier of the effect of subjective benefits (Becker, 2003). I expect that the stronger students' desire to avoid downward mobility is (higher motivation for status maintenance), the greater the effect of the evaluation of the suitability of a degree for status maintenance (subjective benefits) on educational attainment. Here, the motivational factor plays the role of an effect modifier. From this, I derive Hypothesis 4:

Hypothesis 4: The suitability of degrees for status maintenance is more important for decisions about educational careers among those who aspire to avoid downward mobility (those who have high motivation for status maintenance) than among those who care less about it (those who have low motivation for status maintenance).

After testing these hypotheses, I assess the extent to which subjective evaluations can explain the effect of class origin on educational attainment. These are direct tests of rational action theory using data from social surveys (Kroneberg & Kalter, 2012).

5. METHOD

5.1. Data

I use longitudinal data from the High School Students and Mothers (HSM) Survey that began in Japan in 2012. A survey company randomly sampled households from the Basic Resident Register in Japan and asked them to be members of an access panel and to participate in several surveys. After the Basic Resident Register law was amended in 2006 to restrict browsing of the register, the company collected new access panel members from the acquaintances of existing members (snowball sampling). From the list of all access panel members, senior HS students aged 16 and 17 and their mothers, stratified by residential area (nine blocks), population size (more than one hundred thousand or not), and sex, were randomly sampled.

The first survey was conducted with both students and their mothers from November to December 2012. Of 1,560 pairs of students and mothers, 1,070 pairs (68.6%) responded. Although junior HS graduates, students who had dropped out of HS before the survey, and students with a single father were not included, the data are nationally representative of HS students and their mothers and provide rich information about the socioeconomic background of students and about students' and their mothers' evaluations of their educational options and motivation for status maintenance, which enables us to directly test the RRA hypothesis. Follow-up surveys of the mothers and their children were conducted in 2016 and 2019. Of the 1,070 original respondents, 778 mothers (72.7%) and 552 children (51.6%) responded and provided information on the children's educational attainment (828, 77.4%). Such longitudinal data are highly suitable for examining the process of educational decision making (Barone et al., 2018; Stocké, 2007). To reduce the bias due to missing values, I conduct the analysis using multiple imputations (van Buuren, 2018) with several auxiliary variables, such as educational expectations, HS rank, and self-

reported grade in 9th grade. The number of imputations was 80. I did not delete outcomes obtained from multiple imputations (Sullivan et al. 2015), and the sample size was 1,070.

5.2. Variables

Educational Attainment

The dependent variable in this study was the educational attainment of senior HS students after graduation. There were four categories: UNIV, JC including technical colleges, PTC, and HS. The information was collected from both students and their mothers during follow-up surveys conducted in 2016 and 2019. By 2019, 60.8% of students had attended a UNIV, 8.6% of students had attended a JC, 17.3% of students had attended a PTC, and 13.4% of students were not pursuing further education (working, unemployed, or preparing for education). The descriptive statistics for the variables are shown in **Table 1**.

[TABLE 1 ABOUT HERE]

Class Origins

Class origin is based on the occupations of the students' fathers as of 2012 and classified according to the EGP class scheme (Erikson et al., 1979). In the preliminary analysis, I compared the predictive power of the dominant class approach with an approach based on the father's class (Erikson, 1984) and found that the latter (the traditional approach) was closely related to the educational attainment of both boys and girls.[4] Therefore, I used the father's class position as the independent variable of interest.

For simplicity, I used two classes in the analysis: service classes consisting of upper and lower service classes (I+II) and nonservice classes consisting of routine-nonmanual employment (IIIab), self-employed and small employers (IVab), skilled manual workers,

technicians, supervisors (V), semi- and unskilled manual workers (VI+VIIa), and the farming class (IVc+VIIb). I also performed the same analysis using the four-category classification (I+II, IIIab, IVab, and IVc+V+VI+VIIab), but the conclusions remained unchanged (the results are not presented).

Subjective cost, probability, and benefit

I used three variables to measure the subjective cost, probability, and benefit, which are the three key decision-making parameters (Abbiati & Barone, 2017; Stocké, 2007). The HSM survey obtained these measures for four educational options in 2012: UNIV, JC, PTC, and HS.

The HSM survey asked senior HS students to indicate whether the financial burden from completing each of the educational tracks (subjective cost for HS, PTC, JC, UNIV) would be high using a five-point scale [1 = I think so, 2 = I somewhat think so, 3 = neither, 4 = I somewhat do not think so, and 5 = I do not think so]. I recoded the variables so that higher values indicate higher economic costs [0 = I do not think so, 4 = I think so].

For each of the educational options, the students were asked to evaluate (a) whether the subjects would be difficult for them (SPa_{HS}, SPa_{PTC}, SPa_{JC}, and SPa_{UNIV}), (b) whether the exams would be difficult for them (SPb_{HS}, SPb_{PTC}, SPb_{JC}, and SPb_{UNIV}), and (c) whether it would be difficult for them to graduate (SPc_{HS}, SPc_{PTC}, SPc_{JC}, and SPc_{UNIV}). Each answer was given on a five-point scale [1 = I think so, 5 = I do not think so], and I recoded the variables so that the smallest value was zero [0 = I think so, 4 = I do not think so]. I created a composite measure of the subjective probability of success for each educational option by averaging the scores for the three variables (SPa, SPb, and SPc). For example, the subjective probability of success score at a UNIV (SP_{UNIV}) was equal to (SPa_{UNIV} +

SPb_{UNIV} + SPc_{UNIV})/3. The higher the value, the more likely students were to perceive that they would be successful at that school.

In 2012, the HSM survey also asked students whether they would be likely to reach the same or higher occupational position as their parents if they completed each of the educational tracks. These variables were recoded so that higher values indicated that the educational tracks would better help students to maintain their parents' status [0 = I do not think so, 4 = Ithink so].

I also constructed measures for the overall evaluation of subjective costs, probability, and benefits by averaging the corresponding values for all four educational options. For example, $SP_{overall}$ = (SP_{HS} + SP_{PTC} + SP_{JC} + SP_{UNIV})/4, and a high value for $SP_{overall}$ indicated that students believed that they could succeed in basically any educational option. These variables indicate the characteristics of the students rather than their beliefs and evaluations of each educational option.

Motivation for status maintenance

I measured the motivation for status maintenance factor with the following questions:

(1) How dissatisfied will you be if you reach an occupational position that is lower than the occupational positions of your parents? [1 = very dissatisfied, 2 = somewhat dissatisfied, 3 = undecided, 4 = not very dissatisfied, 5 = not at all dissatisfied]

(2) How much do you agree with the following statements? "I want to obtain a more prestigious and reputable occupation than that of my parents." [1 = agree, 2 = somewhat agree, 3 = neither agree nor disagree, 4 = somewhat disagree, 5 = disagree]

(3) "It is important to earn the same level of income as my parents." [1 = agree, 2 = somewhat agree, 3 = neither agree nor disagree, 4 = somewhat disagree, 5 = disagree]

(4) “It is important to obtain an occupation that is as prestigious as that of my parents.” [1 = agree, 2 = somewhat agree, 3 = neither agree nor disagree, 4 = somewhat disagree, 5 = disagree]

These four variables capture the desire of senior HS students to maintain at least the same level of social status as their parents in terms of occupation and income and to avoid downward mobility. These variables are similar to those used in previous studies (Gabay-Egozi et al., 2010; van de Werfhorst & Hofstede, 2007).

After the transformation of the scores for each variable so that the smallest value equalled zero (ranging from 0 to 4), I constructed a composite measure of RRA by averaging the scores for these four variables (Cronbach alpha = 0.857). I used this as an effect modifier of subjective benefit rather than as a factor affecting educational choice or a mediator.

Control Variables

The control variables were the gender of the student, mothers’ age and its square, neighbourhood advantage[5], and self-reported academic performance in the 3rd year of junior HS (9th grade).

Other background characteristics, such as father’s and mother’s education and grandparents’ education, were not used as control variables because they are part of class origin. The data also include information on HS tracks, household income, savings, and the number of children. These variables were not used as controls for simplicity and to avoid overcontrol and collider bias (Acharya et al., 2016; Elwert & Winship, 2014). However, these variables were used as auxiliary variables for multiple imputation. Self-reported academic performance is an exception: although it may induce overcontrol and collider biases, it was included in the model to control for the primary effect.[6]

5.3. Statistical model

The analysis was conducted as follows. First, I analysed the relationship between class origin and the subjective measures to test Hypotheses 1 and 2. Second, I investigated the effect of class origin and subjective measures on educational attainment to test Hypothesis 3. Third, I examined the effect of the interaction between subjective benefits and motivation for status maintenance to test Hypothesis 4.

In the first analysis, because there were evaluations of subjective cost, probability, and benefit for each of the four educational alternatives, I created person-alternative data (the sample size was 1,070 times 4 = 4,280). In the data, the same individual appeared four times (long data format), and the four rows for each individual recorded the evaluations (e.g., subjective cost) for each of the four educational options (alternatives) and which one the individual chose. Four identical values were recorded for variables such as gender and mother's age as time-invariant variables in long-form panel data. Then, I used a linear regression model with cluster robust standard errors to estimate the effect of class origin on the evaluations. For example, in the analysis of the subjective cost, the dependent variable was subjective cost, and the independent variables were the alternatives (four categories), class origin, and the interaction terms between the alternatives and class origin. The models without and with the control variables were compared. A similar analysis was conducted for the subjective probability of success and benefit.

In the second analysis, to investigate the effect of class origin and the subjective measures on educational attainment, I utilized a simple discrete choice model in which students chose from among a set of educational alternatives (HS, PTC, JC, UNIV). Let the utility that student i $(i = 1, \dots, 1070)$ obtains from alternative j $(j = 1,2,3,4)$ be U_{ij}. We can decompose this utility so that $U_{ij} = V_{ij} + \epsilon_{ij}$, where V_{ij} indicates the observed part of the utility and ϵ_{ij} indicates the unobserved part. We can also decompose V_{ij} into two

components: one includes the characteristics of individual i (x_i) (the case- or individual-specific characteristics), such as class origin and gender, and the other includes the characteristics of alternative j for individual i (z_{ij}) (the alternative- or choice-specific characteristics), such as the student's subjective costs, probability, and benefits for each educational option. The equation can be written as follows:

$$U_{ij} = V_{ij} + \epsilon_{ij} = x_i\beta_j + z_{ij}\gamma + \epsilon_{ij},$$

where β_j and γ are the parameters for the alternative-specific and individual-specific characteristics, respectively. β_j is a vector of parameters indicating the relationships between the individual-specific characteristics and the individual's utility from alternative j. γ is a vector of parameters indicating the relationships between the alternative-specific characteristics and the individual's utility from the alternative, with one parameter estimated per alternative-specific variable. The alternative with the highest U_{ij} is the alternative selected by individual i. The person-alternative data are also used in the analysis, and the conditional logit model is applied to estimate the parameters β_j and γ (Long & Freese, 2014). In the conditional logit model, given the individual-specific variable x_i and the alternative-specific variable z_{ij}, the probability that individual i chooses option $j = m$ $(y_i = m)$ is written as follows (Long & Freese, 2014).

$$\Pr(y_i = m | x_i, z_{ij}) = \frac{\exp(\alpha_m + x_i\beta_m + z_{im}\gamma)}{\sum_{j=1}^{J}\exp(\alpha_j + x_i\beta_j + z_{ij}\gamma)},$$

where α_j is an alternative-specific intercept for alternative j. The subjective cost, probability, and benefits for each educational option are included as alternative-specific characteristics, but the overall subjective cost, probability, and benefits are also used as individual-specific characteristics. Not only do the evaluations of each educational option differ, but the evaluations of the educational options as a whole may also differ by class origin, which may affect educational attainment. For example, if students expect the

financial burden from any educational option to be high (high overall subjective cost) or the likelihood of success for any educational option to be low (low overall subjective probability of success), they may be less likely to enter higher education after high school graduation.

To test Hypothesis 4, I include the interaction term between the individual-specific variable (motive for status maintenance) and the alternative-specific variable (subjective benefit in terms of status maintenance), which is itself an alternative-specific variable (z_{ij}); thus, one parameter is estimated.

With the conditional logit models, I investigate how much of the effect of class origin on educational attainment is mediated by the subjective cost, probability, and benefit and motive for status maintenance. In nonlinear models, however, a direct comparison of the estimated coefficients from different models before and after controlling for the mediators is problematic (Breen et al., 2013).[7] Therefore, I apply the Karlson–Holm–Breen (KHB) method to estimate the mediation percentages by using Stata's *khb* command (Breen et al., 2013; Kohler et al., 2011). I also estimated the marginal effects from the conditional logit models (Long & Freese, 2014).

6. Results

6.1. Social Class, Subjective Cost, Probability, Benefit, and Motivation for Status Maintenance

First, I investigate the relationships between the class origin and subjective evaluations of students to test Hypothesis 1. **Figure 2** shows the average of the overall evaluations and the subjective evaluations for each educational option by class origin. Model 1 shows the means of the subjective evaluations by class origin, and Model 2 shows the predicted means after adjusting for the control variables. **Table 2** indicates the marginal effect of

class origin on the subjective evaluations for each educational option estimated from Model 2.

Model 1 in the Subjective Cost panel in **Figure 2** indicates that there is a difference in the overall subjective cost of the educational options by class origin. Compared with students from service classes (I+II), those from nonservice classes (III+IV+V+VI+VII) tend to have higher average subjective costs. Regarding the subjective cost of each educational option, that of UNIV is the highest, followed by PTC and JC, while HS is the lowest. Although the subjective cost of UNIV is equally high for students from both service and nonservice classes, the subjective costs of HS, PTC, and JC are lower for students from service classes than for those from nonservice classes. Model 2 in the Subjective Cost panel presents the predicted means after adjusting for the control variables. The differences in the subjective costs between class origins have decreased. In particular, there is no longer a difference in the subjective cost of UNIV across class origins. This indicates that students from all classes consider the cost of UNIV to be high. **Table 2** shows that the class differences in subjective costs for any educational options are not statistically significant.

The overall subjective probability of success for the educational options also differs by class origin (Model 1 in the Subjective Probability panel of **Figure 3**). The overall subjective probability of success is higher for students from service classes (I+II) than for those from nonservice classes. The subjective probability of success is highest for HS, relatively high for PTC and JC, and lowest for UNIV. However, the differences in the subjective probability of success among educational options are smaller for students from service classes. For students from service classes, the subjective probabilities for PTC and JC are approximately as high as for HS, and the subjective probability of success of UNIV is relatively higher for such students than for those from nonservice classes. Although the class difference decreased, a similar pattern was observable after adjusting for the control

variables, including self-reported GPA in 9th grade (Model 2 in the Subjective Probability panel). **Table 2** also shows clear class differences in the subjective probability of success for higher education (UNIV, JC, PTC), even after controlling for proxy indicators of academic performance.

Model 1 in the Subjective Benefit panel indicates that the overall level of subjective benefits in terms of status maintenance differs among students with different class origins. Students from nonservice classes have a higher subjective benefit level than those from service classes, indicating that it is relatively easy for students from less advantaged classes to achieve the same or a higher occupational position than their parents. The subjective benefit of UNIV in terms of status maintenance differs little across students with different class origins. The subjective benefits of PTC and JC are also high for students from nonservice classes, but for those from service classes, PTC and JC are less beneficial for status maintenance than UNIV. Although students from all classes expect to find it difficult to maintain their status through graduation from HS alone, students from less advantaged classes tend to be more likely to believe that they will be able to maintain their status even with an HS degree than those from service classes. A similar pattern is also observable after adjusting for the control variables (Model 2 of the Subjective Benefit panel). **Table 2** indicates the class differences in the subjective benefits of JC, PTC, and HS. The benefits of JC, PTC, and HS in terms of status maintenance are higher for students from nonservice classes than for those from service classes.

This result indicates that students perceive that a university education provides a high reward in terms of status maintenance but comes with a greater financial burden and a higher risk of failure (Erikson & Jonsson, 1996). Students also perceive that the costs and risk of failure from a high school education are low, but the benefits of only graduating

from high school in terms of status maintenance are also low, especially for students from service classes.

I then test Hypothesis 2. **Figure 4** depicts the means of students' motivation for status maintenance by class origin. As in previous studies and as expected from Hypothesis 2, class origin is not related to the motivation for status maintenance either before or after adjusting for the control variables (Models 1 and 2).

[FIGURES 3 and 4 ABOUT HERE]

6.2. Effects of Social Class and Subjective Evaluations on Educational Attainment

Figure 4 shows the association between class origin and educational attainment. There is a substantial class difference in educational attainment. For example, students with a service class (I+II) origin are more likely to enter UNIV (75.0%), and those with a nonservice class origin are less likely to enter (49.2%). The difference between the two classes is 25.8 percentage points.

[Figure 4 ABOUT HERE]

Table 3 reports the results of the conditional logistic regression analysis. I consider three models. Model 1 includes class origin as the independent variable and the set of control variables. Therefore, Model 1 measures the total effect of social origin. The results of Model 1 show that compared to students whose father was in the nonservice classes, those from the service classes were more likely to attend a UNIV and PTC rather than ending with a HS degree. To test Hypothesis 3, Model 2 adds the subjective evaluations (subjective cost, probability, and benefit) and the motive for status maintenance to Model 1.

The subjective cost, probability, and benefit for each educational option are included as alternative-specific variables, and the overall subjective cost, probability, and benefit are included as individual-specific variables. The overall subjective cost has a negative effect on attending a PTC, which indicates that students who consider the cost of education to be high tend to be less likely to enter a PTC rather than ending with a HS degree. The overall subjective cost also has negative effects on JC and UNIV attendance, but they are not statistically significant. The alternative-specific subjective cost is not related to educational attainment, which implies that comparing the cost of each educational option does not influence students' educational choices. A different pattern is observed for the subjective probability of success. The overall subjective probability of success has no significant effect on educational choices, while the alternative-specific subjective probability of success is related to educational attainment. Comparing the likelihood of success under each educational option influences students' educational choices.

The overall subjective benefit in terms of status maintenance is negatively related to entering higher education (UNIV, JC, and PTC), suggesting that students who are more likely to maintain their parents' status after receiving any education do not go on to higher education, but this effect is not statistically significant. The alternative-specific subjective benefit, however, does have a statistically significant effect on educational attainment. Students choose the educational career that allows them to maintain their parents' status. The motivation for status maintenance itself is not associated with educational attainment.

To test Hypothesis 4, Model 3 adds the interaction between the subjective benefit and the motivation for status maintenance to Model 2. The interaction term is positive and significant, implying that the effect of subjective benefit increases with a higher motivation for status maintenance. This result suggests that the motivation for status maintenance does not directly affect educational attainment but rather modifies the impact of subjective

benefits. Students who care about maintaining their family status are more likely to choose an educational career that allows them to do so.

[TABLE 3 ABOUT HERE]

The marginal effects at the means of class origins, subjective cost, probability, and benefit, and motivation for status maintenance are shown in **Table 4**. As expected from **Table 3**, subjective costs have little effect on the probabilities of educational choices. None of the marginal effects are statistically significant. For the subjective probability of success, only one statistically significant marginal effect is found. An increase in one standard deviation of the subjective probability of success score of UNIV is associated with an increase in the probability of entering UNIV by 3.9% points. Compared to the subjective costs and probability scores, the subjective benefit has a larger impact on educational attainment. An increase in one standard deviation of the subjective benefit of UNIV results in an 8.1% point increase in the probability of attending UNIV and 2.7%, 3.4%, and 2.1% point decreases in the probability of leaving education after HS graduation and attending PTC and JC, respectively. Conversely, an increase of one standard deviation of the subjective benefit of HS leads to a 3.9% point increase in the probability of leaving education after HS graduation and 0.8%, 0.5%, and 2.7% point decreases in the probability of attending PTC, JC, and UNIV, respectively.

[TABLE 4 ABOUT HERE]

Figure 5 depicts the marginal effects of the subjective benefit of each educational option across the levels of motivation for status maintenance estimated from Model 3. The

diagonal elements in **Figure 5** indicate that, in general, if the motivation to maintain status is large and the benefit of a certain education in terms of avoiding downward mobility is also large, students are more likely to choose that education. Here, I focus on the benefits of graduating from UNIV. An increase in one standard deviation of the subjective benefit of UNIV is associated with an increase in the probability of entering UNIV of 8.02% points for students at the 50th percentile of the motivation score for maintaining status. However, that number rises to 10.6 percentage points at the 75th percentile and 13.7 percentage points at the 95th percentile of the motivation score, indicating that the impact of the benefit of UNIV in terms of avoiding downward mobility is stronger for students who are more motivated to avoid downward mobility. On the other hand, the figure drops to 5.2 percentage points at the 25th percentile (statistically significant) and 1.3 percentage points at the 5th percentile (not significant), indicating that the subjective benefits have a smaller impact on UNIV enrolment for students who consider downward mobility unimportant. The higher the motivation and the higher the benefit of UNIV, the less likely students are to choose other educational paths.

[Figure 5 ABOUT HERE]

The marginal effects of class origin estimated before controlling for subjective evaluations (estimated by Model 1 in **Table 3**) indicate that on average, students from the service classes are approximately 19.3% points more likely than those from the nonservice classes to enter UNIV, approximately 4.8% and 4.7% points less likely to enter PTC and JC and approximately 9.7% points less likely to be HS graduates. After adjusting for subjective evaluations (estimated by Model 3 in **Table 3**), the magnitude of the marginal effects of class origin become slightly smaller: from 19.3% points to 17.0% points for UNIV, from -

4.7% points to -4.0% points for JC, from -4.8% points to -4.7% points for PTC, and from -9.7% points to -8.2% points for HS.

[TABLE 4 ABOUT HERE]

6.3. Mediation Analysis

I investigate how much of the effect of class origin on educational attainment is mediated by the subjective evaluations of educational options and motivation for status maintenance. Each set of subjective variables is added to Model 1 in Table 2 to determine which set of variables explains the effect. Then, all subjective variables, including the interaction term, are added to determine their total explanatory power (as in Model 3). The estimated mediation percentages are shown in **Table 4**. I evaluate the mediation percentages only for the variables for which a statistically significant association was found in **Table 3** (values in bold in **Table 4**).

From the 1st to the 5th columns in **Table 5**, the subjective probability of success is more important than the subjective cost and benefits and motivation for status maintenance in explaining the effect of class origin. Although **Table 3** shows a statistically and substantially significant effect of subjective benefits on educational attainment, it explains little of the effect of class origin. The last column in **Table 5** shows that these subjective evaluations explain approximately 7.9% of the effect of class origin on the choice to enter university rather than leave the educational system after high school graduation. The effect of class origin on JC and PTC enrolment is not well explained by the subjective evaluations and the motivation for status maintenance.

[TABLE 5 ABOUT HERE]

7. Discussion and Conclusions

Students with different class origins choose different educational paths. This study tested whether the BG model of educational decision making can explain the effect of class origin on educational attainment in an East Asian society, Japan. By analysing the data from a longitudinal survey that began in 2012 when the children were senior HS students, the following results were obtained.

First, the subjective cost of education is not affected by class origin. Previous studies conducted in European countries have found similar results. However, the subjective probability of success and benefits in terms of status maintenance are affected by students' class origin. This result partially supports Hypothesis 1, which states that the subjective probability of success and benefits are affected by class origin. Abbiati and Barone (2017) found that upper secondary school seniors in Italy tend to overestimate the costs of a university education (tuition fees, study materials, and food and transportation costs). This tendency is similar among students from different social classes. Students from more advantaged families overestimate the economic returns to a university degree to a greater extent and perceive a higher probability of success in higher education than do those from less advantaged families. Similarly, the cost of attending university in Japan is perceived to be quite high, and students from different backgrounds feel a similar level of financial burden. The analysis also indicates that the motivation for status maintenance is not related to class origin, supporting Hypothesis 2, which states that families from all social backgrounds *alike* want to avoid downward social mobility.

Second, subjective costs, the subjective probability of success and subjective benefits affect educational attainment. The overall subjective cost and subjective probability of

success affect educational attainment, but the overall subjective benefit does not. Students with high overall subjective cost are less likely to choose to enrol in a PTC, while students with a high overall subjective probability of success are more likely to go to UNIV. The subjective costs and subjective probability of success for each educational option do not affect educational attainment, but the subjective benefits for each educational option are important in educational choice. Students are more likely to choose educational options that have a higher subjective benefit in terms of status attainment. In other words, students tend to choose educational options associated with a low probability of downward mobility in their future careers.

One of the limitations of this study is that the students' evaluations of costs may be inaccurate, uncertain, and biased (Abbiati & Barone, 2017). To check for robustness, a similar analysis was conducted by using mothers' evaluations of the subjective cost, subjective probability of success, and subjective benefit (motivation for status maintenance was measured only for children), which may be more accurate and certain and less biased, especially regarding the financial burden and costs. The results were almost the same (**Table A in Appendix**). The overall subjective costs of mothers were significantly associated with entering PTC rather than HS, but the subjective cost of each educational option was not related to the students' educational choice.

Although Hypothesis 3 was supported, it is necessary to consider whether the overall evaluations of costs, of the probability of success, and benefits are important, whether the evaluations for each educational option are important, or whether both are important for students' educational decision making. Regarding the evaluations for each educational option, the subjective benefits for each educational option in terms of status maintenance have an impact on students' educational choices, as the BG model suggests.

Third, there is an interaction effect between the motivation for status maintenance and the subjective benefits in terms of status maintenance, supporting Hypothesis 4. Previous studies have used the motivational factor as an independent variable when predicting educational outcomes (Gabay-Egozi et al., 2010; Stocké, 2007; van de Werfhorst & Hofstede, 2007). Instead of using the motivational factor as a determinant of educational attainment, this study used it as an effect modifier that amplifies or mitigates the effect of the subjective benefits in terms of status maintenance on educational attainment.

Fourth, although the results of this study partially supported Hypotheses 1 to 4, the subjective variables used have little power to explain the differences in educational attainment by student class origin, unlike other direct tests of the BG model, such as that by Stocké (2007).

In conclusion, the BG model of educational decision making in Japan is not supported. As expected from the BG model, the subjective costs, probability, and benefits affect educational attainment, and there is an interaction effect between subjective benefit and motivation for status maintenance. Nonetheless, the explanatory power of the model is rather weak, as shown in **Table 5.** This may be because there are small differences in the evaluations of educational options among students with different class origins in Japan (Kondo, 2002), as confirmed in **Figure 2**.

There are several limitations to this study, such as the nonrandom sample, the small sample size, the lack of single-father families, and the possibly inaccurate and uncertain measurement of subjective costs, probability, and benefits. Nonetheless, this study contributes a test of the validity of the BG model in a non-European society, Japan. Generally, the results obtained here are similar to those obtained by Stocké (2007). The analysis indicates that subjective measures do not mediate the effect of class origin on educational attainment. Moreover, this study finds a positive and significant interaction

effect between the motivation for status maintenance and subjective benefits, which is also implied by Becker (2003). Although these findings mainly concur with the assumptions and predictions derived from the BG model of educational decision making, the explanatory power of the model is not very strong, indicating the limited validity of the model for understanding the mechanisms underlying educational inequality in Japan.

Despite these results, as Baron et al. (2021) suggest, we need to address educational inequality from theories and hypotheses that are extended from RRA rather than abandoning it. In Japanese society, where people are highly oriented towards higher education and have a strong interest in education, it is widely argued that avoiding downward educational mobility is a more important mechanism of educational inequality than avoiding downward class mobility (Kikkawa, 2006, 2022, see also Breen & Yaish, 2006; Mare & Chang, 2006). While methods to successfully measure this motivation have not yet been fully discussed, we need to take into account these additional and modified models and test them in different societies.

Notes

1. See also Esser (1999), Becker (2003), and Erikson and Jonsson (1996) for rational choice models of educational decision making.

2. See Erikson et al. (2005) for a comparison of the importance of primary and secondary effects.

3. Barone et al. (2018) did not find class differences in the expected direct costs of continuing a university education, but they found that perceived indirect costs were related to class origin.

4. In the preliminary analysis, I added both the father's and mother's EGP class into the analysis (Beller, 2009), but I found that only the father's EGP class was related to

children's educational attainment.

5. The neighbourhood advantage variable was created via a principal component analysis using the five socioeconomic characteristics of the census basic unit block and the municipality from the 2010 and 2015 Population Census: the unemployment rate, the share of professionals and managers in the population, the share of UNIV graduates in the population, the junior HS graduation rate, and the divorce rate.

6. As Erikson et al. (2005) discussed, an anticipatory decision regarding university enrolment during early stages influences the extent to which students study hard and prepare for their examinations. Thus, controlling for academic performance may lead to an underestimation of the effect of class origin. Parents' anticipatory decision for their children to enter university also affects their children's HS track, their savings, and their number of children and may even affect household income.

7. Stocké (2007) compares coefficients across conditional logit models, but this method is not suitable for a nonlinear model (Breen et al., 2013).

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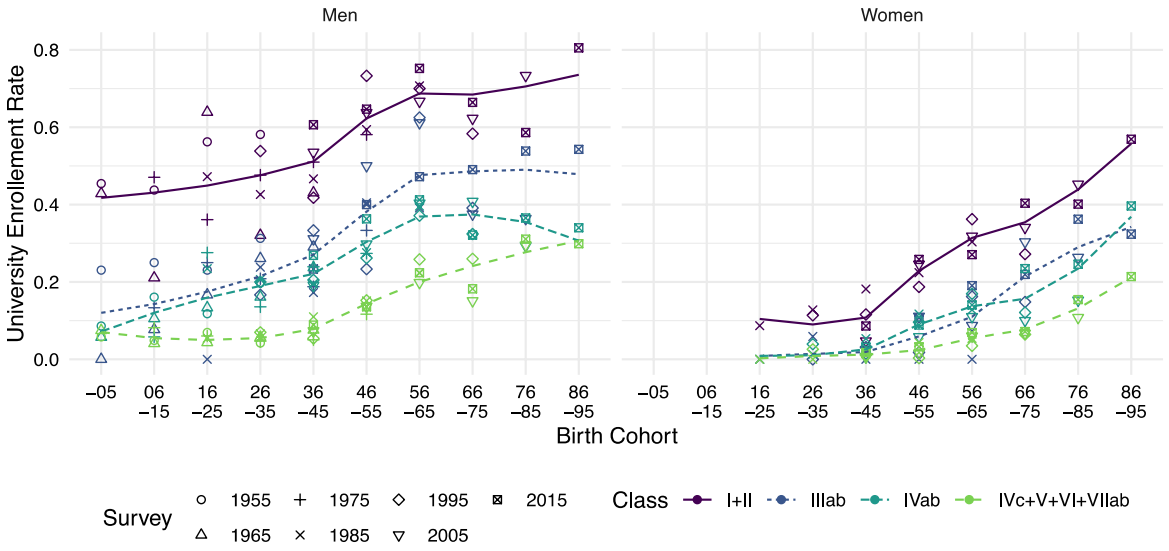

Figure 1. Class differences in the probability of having attended UNIV across birth cohorts for men (*n* = 16,198) and women (*n* = 10,105)

Source: The Social Stratification and Social Mobility (SSM) Surveys, 1955-2015.

Note: The locally weighted scatterplot smooth (loess) was used for the lines.

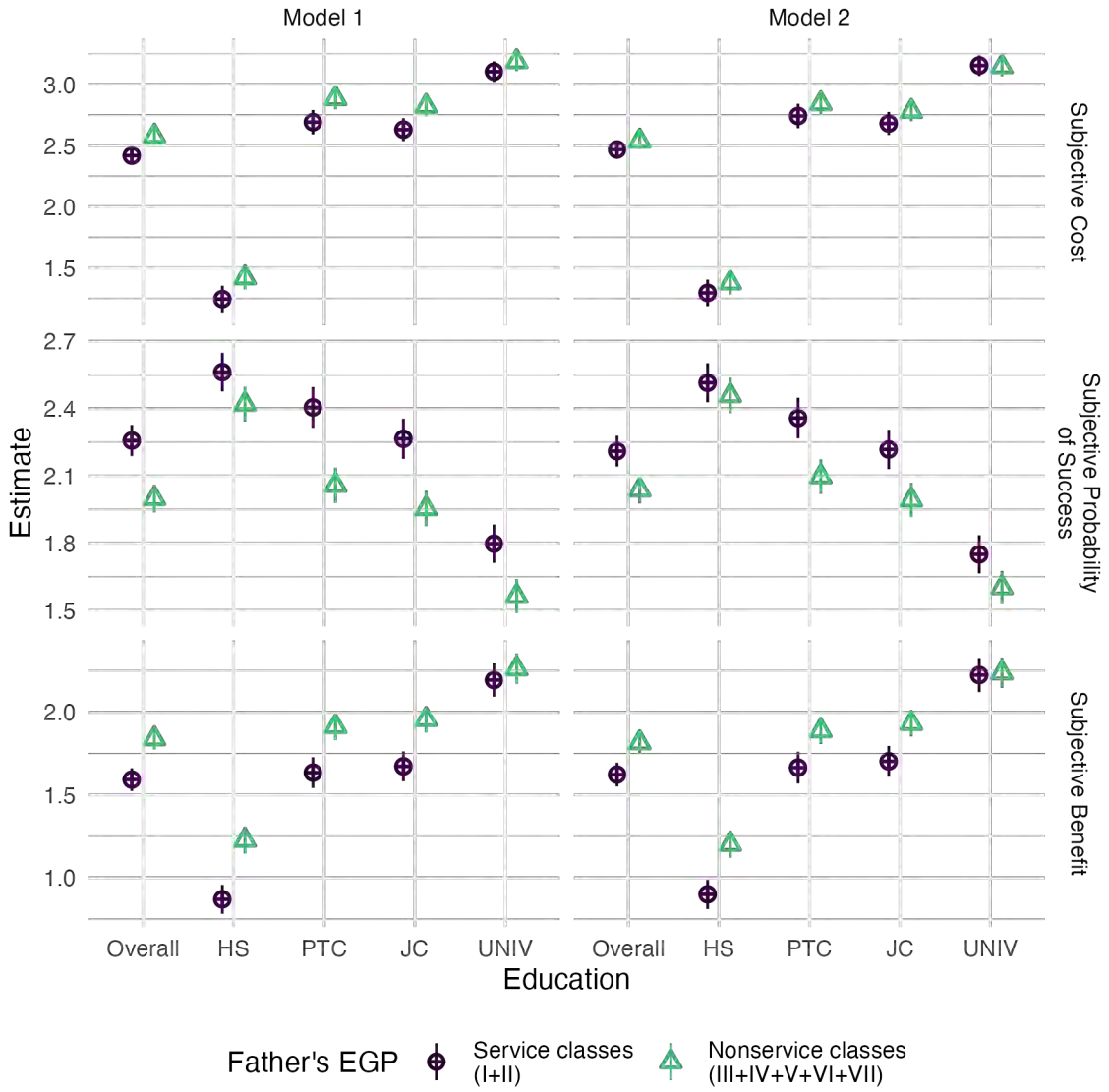

Figure 2. The associations of subjective cost, probability, and benefit with students' class origins before and after adjusting for the control variables.

Note: Overall: average of the scores for the four educational options. HS: high school, PTC: professional training college, JC: junior college, and UNIV: four-year university. Model 1 shows the means of the subjective evaluations by class origin, and Model 2 shows the predicted means after adjusting for the control variables.

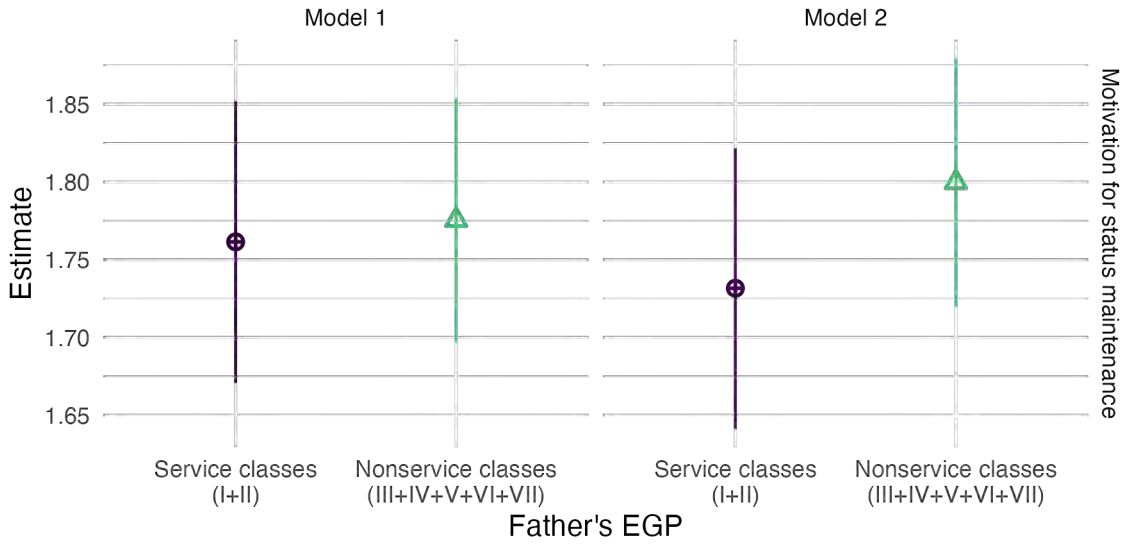

Figure 3. The associations between motivation for status maintenance and students' class origins before and after adjusting for the control variables.

Note: Model 1 shows the mean of the motivation factor by class origin, and Model 2 shows the predicted mean after adjusting for the control variables.

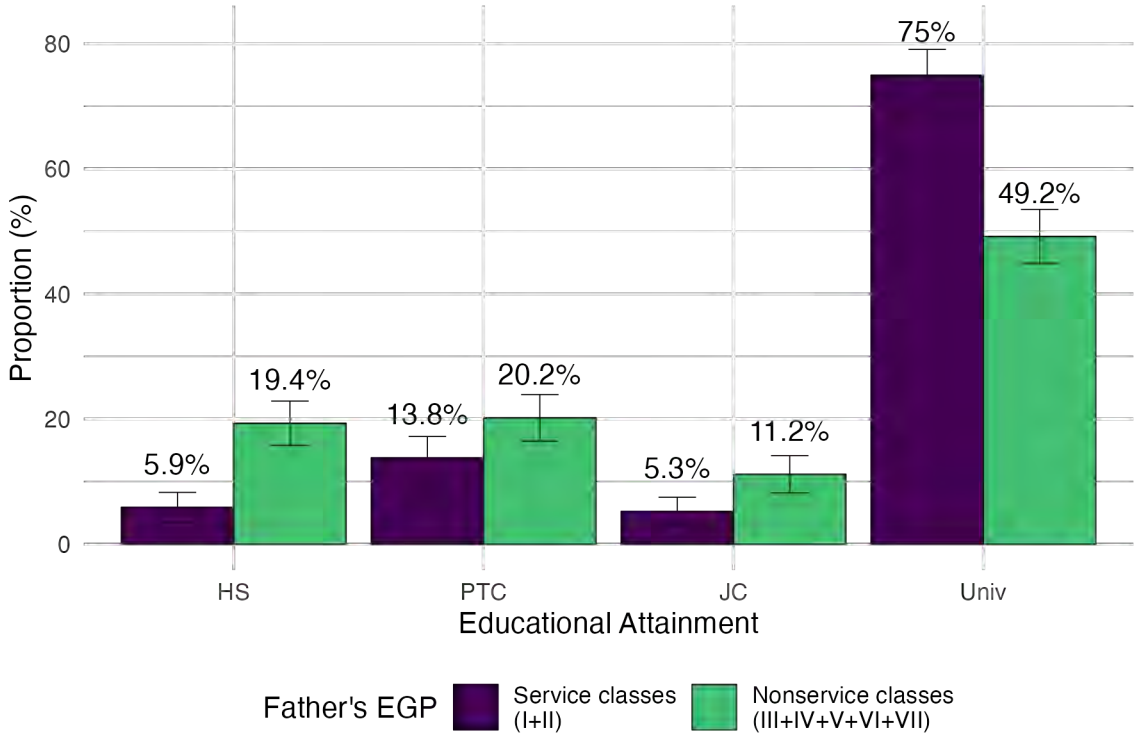

Figure 4. The association between students' class origins and educational attainment

Note: The error bars indicate the 95% confidence intervals.

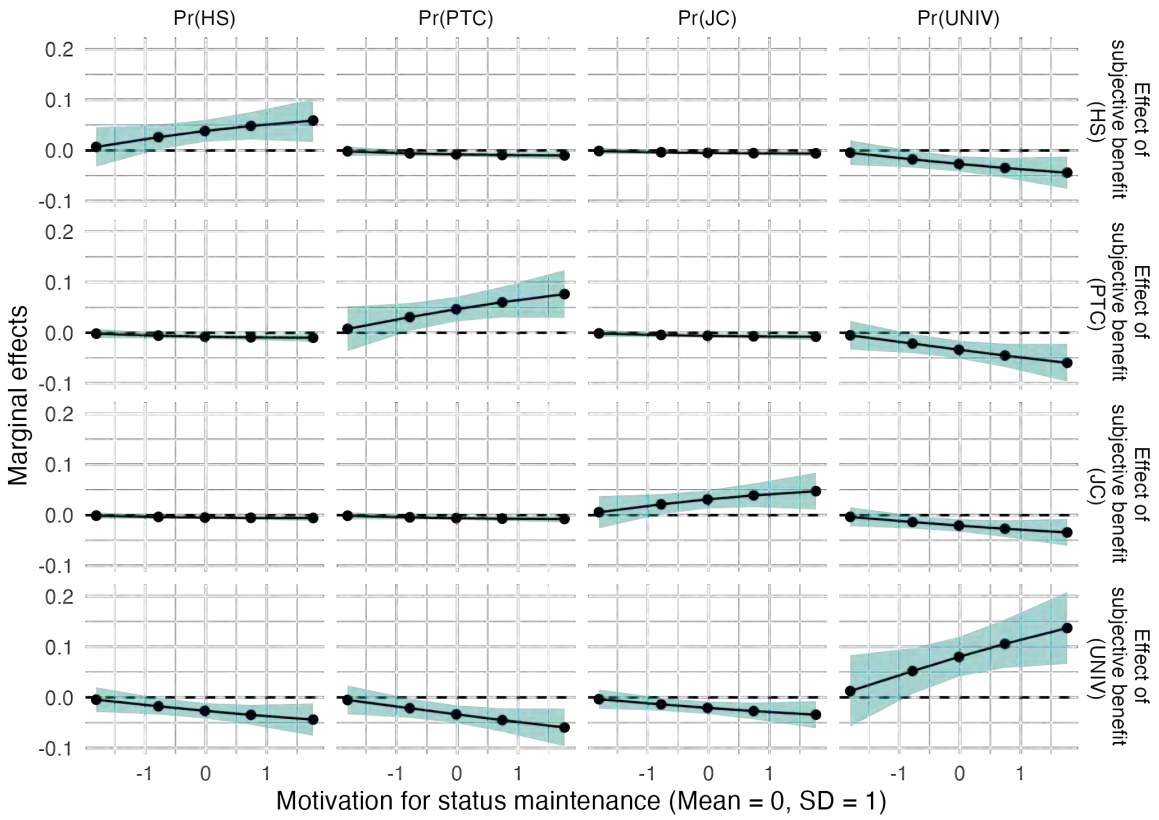

Figure 5. Marginal effects of the subjective benefit of each educational option across the levels of motivation for status maintenance.

Note: All subjective measures were standardized. The ribbons indicate the 95% confidence intervals. The points represent the 5%, 25%, 50%, 75%, and 95% scores of motivations for status maintenance from the smallest to the largest.

Table 1. Descriptive statistics

	Mean/Prop.	SD
Educational attainment		
Univ	60.77	
JC	8.54	
PTC	17.36	
HS	13.33	
Class origin		
Service class (I+II)	44.84	
Nonservice class (III+IV+V+V+VII)	55.16	
Subjective cost (Univ)	3.151	0.936
Subjective cost (JC)	2.737	1.007
Subjective cost (PTC)	2.799	1.080
Subjective cost (HS)	1.343	1.192
Subjective cost (Overall)	2.507	0.766
Subjective probability (Univ)	1.669	0.937
Subjective probability (JC)	2.094	0.979
Subjective probability (PTC)	2.214	0.985
Subjective probability (HS)	2.484	0.947
Subjective probability (Overall)	2.115	0.769
Subjective benefit (Univ)	2.232	1.117
Subjective benefit (JC)	1.830	0.984
Subjective benefit (PTC)	1.788	1.013
Subjective benefit (HS)	1.067	0.993
Subjective benefit (Overall)	1.729	0.786
Motivation for status maintenance	1.769	0.980
Gender		
Men	49.16	
Women	50.84	
Mother’s age	45.999	3.592
Neighbourhood advantage	0.500	0.289
Self-reported GPA in 9th grade	2.433	1.150
n	1,070	

Table 2. The average marginal effect of class origin on subjective cost, probability, and benefit estimated from Model 2 in Figure 2.

	Subjective cost	Subjective probability of success	Subjective benefit in terms of status maintenance
Service class (I+II) vs.			
Nonservice class (III+IV+V+VI+VII)			
Univ	0.009 (0.060)	0.148 (0.058)*	-0.014 (0.070)
JC	-0.099 (0.064)	0.225 (0.061)***	-0.229 (0.063)***
PTC	-0.101 (0.068)	0.261 (0.062)***	-0.223 (0.065)**
HS	-0.083 (0.075)	0.057 (0.061)	-0.302 (0.063)***

Note: Standard errors are in parentheses. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ (two-tailed tests).

Table 3. The effect of class origin, subjective cost, probability, benefit, and motivation for status maintenance on educational attainment.

	Model 1		Model 2		Model 3	
	Coef.	exp(Coef.)	Coef.	exp(Coef.)	Coef.	exp(Coef.)
Individual-specific Parameters						
Educational option						
Univ	-2.041 (0.347)***	0.130	-1.754 (0.396)***	0.173	-1.756 (0.399)***	0.173
JC	-2.151 (0.467)***	0.116	-2.003 (0.518)***	0.135	-1.966 (0.519)***	0.140
PTC	-0.690 (0.355)	0.501	-0.677 (0.401)	0.508	-0.647 (0.403)	0.524
Univ vs. HS						
I+II vs. III+IV+V+VI+VII	1.327 (0.275)***	3.771	1.212 (0.282)***	3.361	1.204 (0.282)***	3.332
Overall subjective cost			-0.184 (0.147)	0.832	-0.189 (0.150)	0.828
Overall subjective probability of success			0.182 (0.153)	1.200	0.163 (0.155)	1.178
Overall subjective benefit			-0.243 (0.155)	0.784	-0.215 (0.157)	0.806
Motivation for status maintenance			0.157 (0.137)	1.171	0.019 (0.159)	1.019
JC vs. HS						
I+II vs. III+IV+V+VI+VII	0.428 (0.375)	1.535	0.373 (0.381)	1.452	0.353 (0.382)	1.423
Overall subjective cost			-0.337 (0.205)	0.714	-0.337 (0.205)	0.703
Overall subjective probability of success			-0.099 (0.202)	0.906	-0.099 (0.202)	0.896
Overall subjective benefit			-0.108 (0.207)	0.898	-0.108 (0.207)	0.914
Motivation for status maintenance			-0.012 (0.176)	0.988	-0.111 (0.191)	0.895
PTC vs. HS						
I+II vs. III+IV+V+VI+VII	0.726 (0.310)*	2.066	0.685 (0.323)*	1.984	0.679 (0.324)*	1.972
Overall subjective cost			-0.370 (0.167)*	0.691	-0.370 (0.167)*	0.683
Overall subjective probability of success			-0.328 (0.176)	0.720	-0.328 (0.176)	0.711
Overall subjective benefit			-0.154 (0.176)	0.857	-0.154 (0.176)	0.866
Motivation for status maintenance			0.028 (0.165)	1.028	-0.065 (0.179)	0.937
Alternative-specific Parameters						
Subjective cost			-0.082 (0.088)	0.921	-0.082 (0.088)	0.921
Subjective probability of success			0.164 (0.082)*	1.178	0.162 (0.083)*	1.176
Subjective benefit			0.333 (0.080)***	1.395	0.335 (0.083)***	1.398

Subjective benefit x Motivation for status maintenance			0.158 (0.071)*	1.171
Controls	YES	YES	YES	
n	1,070	1,070	1,070	
observations	4,280	4,280	4,280	

Note: In all models, the gender of the child, mothers' age and its square, neighbourhood advantage, and self-reported GPA in 9th grade were included as control variables. All subjective measures were standardized (mean = 0, SD = 1). Standard errors are in parentheses. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ (two-tailed tests).

Table 4. The marginal effects of class origin, subjective cost, probability, and benefit, and motivation for status maintenance.

	Educational attainment			
	Pr(HS)	Pr(PTC)	Pr(JC)	Pr(UNIV)
I+II vs. III+IV+V+VI+VII (Model 1)	-0.097 (0.022)***	-0.048 (0.022)*	-0.047 (0.026)	0.193 (0.035)***
I+II vs. III+IV+V+VI+VII (Model 3)	-0.082 (0.021)***	-0.047 (0.021)*	-0.040 (0.026)	0.170 (0.035)***
Subjective cost (Model 3)				
HS	-0.010 (0.010)	0.002 (0.002)	0.001 (0.001)	0.007 (0.007)
PTC	0.002 (0.002)	-0.012 (0.012)	0.001 (0.002)	0.008 (0.009)
JC	0.001 (0.001)	0.001 (0.002)	-0.008 (0.009)	0.005 (0.006)
UNIV	0.007 (0.007)	0.008 (0.009)	0.005 (0.006)	-0.020 (0.021)
Subjective probability (Model 3)				
HS	0.019 (0.010)	-0.004 (0.002)	-0.002 (0.001)	-0.013 (0.007)
PTC	-0.004 (0.002)	0.023 (0.012)	-0.003 (0.002)	-0.016 (0.009)
JC	-0.002 (0.001)	-0.003 (0.002)	0.015 (0.008)	-0.010 (0.005)
UNIV	-0.013 (0.007)	-0.016 (0.009)	-0.010 (0.005)	0.039 (0.020)**
Subjective benefit (Model 3)				
HS	0.039 (0.011)***	-0.008 (0.002)***	-0.005 (0.002)**	-0.027 (0.008)***
PTC	-0.008 (0.002)***	0.047 (0.012)***	-0.006 (0.002)**	-0.034 (0.009)***
JC	-0.005 (0.002)**	-0.006 (0.002)**	0.031 (0.009)***	-0.021 (0.006)***
UNIV	-0.027 (0.008)***	-0.034 (0.009)***	-0.021 (0.006)***	0.081 (0.020)***
Motivation for status maintenance (Model 2)	-0.013 (0.015)	-0.012 (0.017)	-0.011 (0.013)	0.036 (0.023)

Note: The marginal effect of motivation for status maintenance cannot be estimated from Model 3. The results for the overall evaluations are not shown.

Table 5. Mediation percentages estimated with the KHB method.

Variables	Variables added to Model 1 in Table 2					
	Subjective cost	Subjective probability	Subjective benefit	Motivation for status maintenance	Subjective benefit X Motivation for status maintenance	All (Model 3)
Univ vs. HS	2.4%	6.5%	3.8%	-0.5%	3.7%	7.9%
JC vs. HS	7.9%	6.2%	-7.4%	1.1%	-9.5%	-2.0%
PTC vs. HS	4.1%	-1.8%	-4.0%	0.5%	-4.1%	-4.1%

Note: Both the overall and the alternative-specific measures of the subjective evaluations were included.

Appendix

Table A. The effect of class origin and subjective cost, probability, and benefit of mothers on educational attainment.

	Model 1		Model 2		Model 3	
	Coef.	exp(Coef.)	Coef.	exp(Coef.)	Coef.	exp(Coef.)
Individual-specific Parameters						
Educational option						
Univ	-2.041 (0.347)***	0.130	-1.592 (0.445)***	0.204	-1.594 (0.445)***	0.203
JC	-2.151 (0.467)***	0.116	-1.847 (0.550)**	0.158	-1.851 (0.550)**	0.157
PTC	-0.690 (0.355)†	0.501	-0.365 (0.437)	0.694	-0.369 (0.437)	0.691
Univ vs. HS						
I+II vs. III+IV+V+VI+VII	1.327 (0.275)***	3.771	1.138 (0.279)***	3.120	1.138 (0.279)***	3.120
Mother's overall subjective cost			-0.237 (0.164)	0.789	-0.239 (0.164)	0.788
Mother's overall subjective probability of success			0.311 (0.137)*	1.365	0.311 (0.137)*	1.365
Mother's overall subjective benefit			-0.187 (0.141)	0.829	-0.189 (0.141)	0.828
Motivation for status maintenance			0.096 (0.122)	1.101	0.118 (0.137)	1.126
JC vs. HS						
I+II vs. III+IV+V+VI+VII	0.428 (0.375)	1.535	0.281 (0.377)	1.325	0.283 (0.378)	1.327
Mother's overall subjective cost			-0.255 (0.212)	0.775	-0.255 (0.212)	0.774
Mother's overall subjective probability of success			0.025 (0.170)	1.025	0.025 (0.170)	1.024
Mother's overall subjective benefit			-0.107 (0.173)	0.899	-0.107 (0.173)	0.898
Motivation for status maintenance			-0.056 (0.156)	0.946	-0.044 (0.159)	0.957
PTC vs. HS						
I+II vs. III+IV+V+VI+VII	0.726 (0.310)*	2.066	0.556 (0.317)	1.743	0.558 (0.317)	1.747
Mother's overall subjective cost			-0.370 (0.179)*	0.691	-0.370 (0.179)*	0.690
Mother's overall subjective probability of success			-0.058 (0.149)	0.944	-0.058 (0.149)	0.943
Mother's overall subjective benefit			-0.205 (0.145)	0.814	-0.205 (0.145)	0.813

Motivation for status maintenance		-0.014 (0.138)	0.986	-0.001 (0.141)	0.999
Alternative-specific Parameters					
Mother's subjective cost		-0.115 (0.112)	0.892	-0.114 (0.112)	0.892
Mother's subjective probability of success		0.066 (0.083)	1.068	0.064 (0.083)	1.066
Mother's subjective benefit		0.354 (0.082)***	1.425	0.353 (0.082)***	1.424
Mother's subjective benefit x Motivation for status maintenance				-0.028 (0.076)	0.972
Controls	YES	YES		YES	
n	1,070	1,070		1,070	
observations	4,280	4,280		4,280	

Note: In all models, the gender of the child, mothers' age, neighbourhood advantage, and self-reported GPA in 9th grade were included as control variables. All subjective measures were standardized (mean = 0, SD = 1). Standard errors are in parentheses. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ (two-tailed tests).